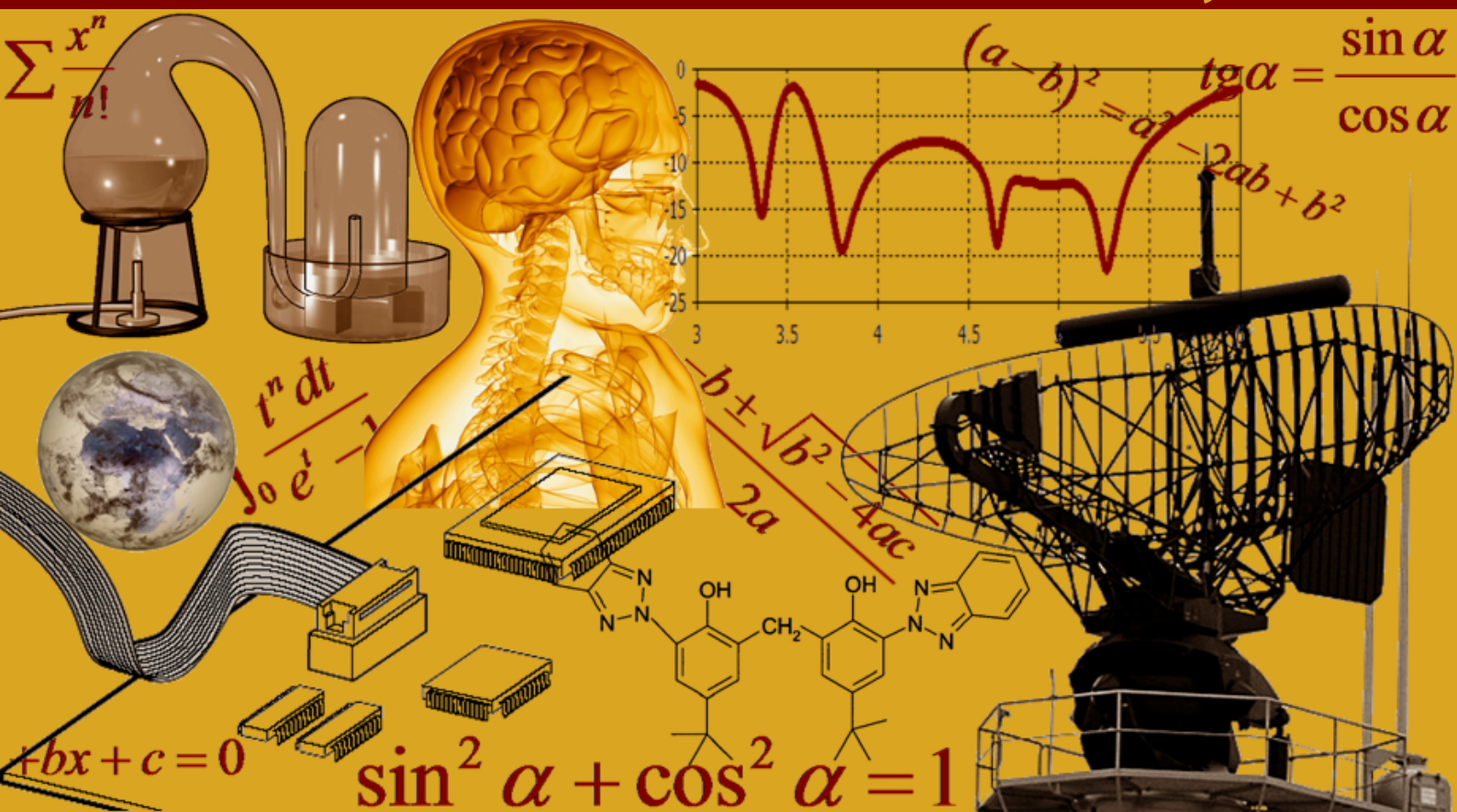


INTERNATIONAL JOURNAL OF INNOVATION AND SCIENTIFIC RESEARCH

Vol. 3 N. 2 June 2014



International Peer Reviewed Monthly Journal



International Journal of Innovation and Scientific Research

International Journal of Innovation and Scientific Research (ISSN: 2351-8014) is an open access, specialized, peer-reviewed, and interdisciplinary journal that focuses on research, development and application within the fields of innovation, engineering, science and technology. Published four times per year in English, French, Spanish and Arabic, it tries to give its contribution for enhancement of research studies.

All research articles, review articles, short communications and technical notes are sent for blind peer review, with a very fast and without delay review procedure (within approximately two weeks of submission) thanks to the joint efforts of Editorial Board and Advisory Board. The acceptance rate of the journal is 75%.

Contributions must be original, not previously or simultaneously published elsewhere. Accepted papers are available freely with online full-text content upon receiving the final versions, and will be indexed at major academic databases.

Table of Contents

Production of Polyhydroxybutyrate using agro-industrial waste by <i>Pseudomonas aeruginosa</i>	107-110
Impact of Social Media on Personality Development	111-116
Coronary Heart Disease	117-126
Determination of the Anti-nutrient Composition of <i>Ocimum gratissimum</i> , <i>Corchorus olitorius</i> , <i>Murraya koenigii</i> Spreng and <i>Cucurbita maxima</i>	127-133
Future Anxiety And Its Relation With Adjustment Of University In A Sample Of Al-Taif University Students, Turbah's Branch	134-167
High Pressure Processing- Changes in Quality Characteristic of Various Food Material Processed Under High Pressure Technology	168-186
How admitted factors influence on quality management	187-192
Customer Satisfaction	193-198
Multiculturalism	199-207
Postuino: Bad Posture Detector using Arduino	208-212
Total Quality Management	213-217
Characteristics and the State of Land Ownership in Informal Settlements in Nairobi, Kenya	218-226

Production of Polyhydroxybutyrate using agro-industrial waste by *Psuedomonas aeruginosa*

SHRUTI SHANTILAL PATEL

Mitcon
Biotechnology and Pharmaceutical Centre,
Agriculture College Campus,
Shivajinagar, Pune, India

Copyright © 2014 ISSR Journals. This is an open access article distributed under the **Creative Commons Attribution License**, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT: Plastics have been an integral part of our life. However, disposal of these non-biodegradable (petrochemical derived) plastics poses a threat to our environment. Thus, much interest has been gained in developing biodegradable plastics. Polyhydroxybutyrates (PHBs) are polymers that accumulate as carbon/energy in microbial cells and provide an alternative to petrochemical plastic because of their biodegradability properties. However, major problems in commercializing PHB is the high production cost due to expensive carbon substrates. Therefore, the applications of cheap carbon sources have been explored. In this study, *P. aeruginosa* has ability to convert agro-industrial waste like Rice husk, Cotton seed husk, Walnut shell and Corn cob meal in to PHB. Highest cellular PHB content was obtained from Rice husk as source of carbon which was found to be 0.26 g/L. As Rice husk is agro-industrial waste its use in PHB production may prove beneficial, and hence may become an area of further research.

KEYWORDS: PHB, *Psuedomonas aeruginosa*, Agro-industrial waste, Rice husk, Crotonic acid.

INTRODUCTION

Today's world is almost unimaginable without plastics, but most of these materials have historically been derived from oil and face potential problems with increasing fossil fuel costs, potential scarcity and customer demands for alternatives. These concerns have helped generate new research and development of alternative raw materials for use in Bioplastics. In this experiment agro-industrial waste like Rice husk, Cotton seed husk, Walnut shell and Corn cob meal were used as a carbon source and PHB production were carry out. Moreover, the use of renewable sources in their manufacturing plays a key role in maintaining environment health. There are many advantages of bioplastics over conventional plastics such as reduced dependence on fossil fuels, non toxic, easier to recycle, require less energy to produce, renewable and eco-friendly. Earlier studies showed that Polyhydroxybutyrate (PHB) is bio-degradable material, which has physical properties similar to the synthetic plastic. PHB is synthesized by bacteria under unbalanced growth conditions. Some bacteria have been reported capable to produce PHA as much as 90%(w/w) of dry cells during depletion of essential nutrients such as nitrogen, phosphorus or magnesium(Madison and Huisman, 1999).

MATERIALS AND METHODS

SCREENING FOR PHB PRODUCTION

PHB producing bacteria was detected using the lipophilic stain Sudan black staining. Sudan black stain was prepared as a 0.3% solution(w/v) in 60% ethanol. Smears of PHB producing bacteria were prepared on glass slides and heat fixed. Samples were stained for 10min with Sudan black solution, rinsed with water and counter-stained with 0.5% safranin for 5s. Stained samples were observed under oil immersion at 1000x magnification with direct bright-field illumination (Burdon et al., 1942).

USE OF DIFFERENT AGROINDUSTRIAL WASTE

Rice husk powder, Cotton seed husk powder, walnut shell powder and corn cob meal were obtained from surat city.

DILUTED ACID HYDROLYSIS OF SOLID AGRO-INDUSTRIAL WASTE

PHB production by *Psuedomonas aeruginosa* was tested using hydrolyzed wastes. Rice husk powder, Cotton seed husk powder, walnut shell powder and corn cob meal were hydrolyzed by 2.5% v/v sulphuric acid (Buhner and Agblevor, 2004) and autoclaved at 121°C and 15 psi for 30 min. The hydrolyzed samples were filtered and supernatants were neutralized using sodium hydroxide(6N). Reducing sugar content was determined using DNSA method (Miller, 1959). The Basal media Broth (Yeast extract 1g/L, Peptone 5g/L, Di-Sodium hydrogen phosphate 1g/L, Magnesium sulfate 0.2g/L, Glucose 10gm/L) were prepared using this hydrolysate instead of glucose. 10%v/v and 24h pre-grown culture of *Psuedomonas aeruginosa* was inoculated and incubated at 37°C for 48-72h on shaking incubator (Santimano et al., 2009).

EXTRACTION OF PHB

After incubation samples were centrifuge for 15min at 6000rpm. The pellet were washed twice with sterile deionized water and dried for 24h at 60°C. The total bacterial dry weight was determined. Sodium hypochlorite was added to dry cell biomass and was incubated at 37°C for 2h. to break the cell wall of bacteria. These samples were centrifuge at 6000rpm for 15min and supernatant was treated further. Using 96%v/v ethanol:acetone(1:1) cell lipid and other molecules except PHB were extracted from supernatant. The extraction of PHB done by hot chloroform (adding chloroform in waterbath). Crystals of PHB obtained after evaporation of chloroform (Belma et al., 2002).

DETERMINATION OF PHB

PHB crystals undergo dehydration on treatment with sulphuric acid and heat to produced crotonic acid. The extracted PHB was converted to crotonic acid by adding 98% sulphuric acid and heating to 60°C for 1h. Crotonic acid shows maximum absorption at 235nm. The absorbance of the solution was measured at 235nm in a UV spectrophotometer against a sulphuric acid as blank. The amount of PHB per gram dry weight of bacterial cells was determined using standard curve of PHB using crotonic acid (Belma et al., 2002).

RESULTS AND DISCUSSION

The Sudan black B stained slide was observed under compound microscope with oil immersion lens. Then dark black condensed molecules of PHB were observed inside cell surrounding pink cytoplasm [Figure : 1]. The crystal of PHB obtained after evaporation of chloroform. The PHB crystal was dried in oven and measured the dry weight of PHB production. The sensitivity quantification of PHB content was determined by crotonic acid assay. The PHB yield and biomass concentration increased during 48h and highest PHB content obtained from Rice husk [Table : 1] [Graph : 1].

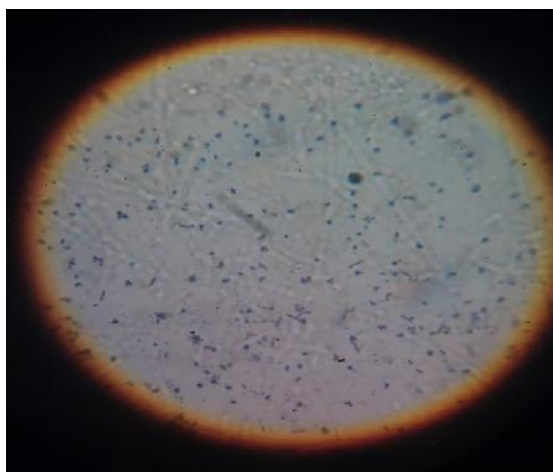
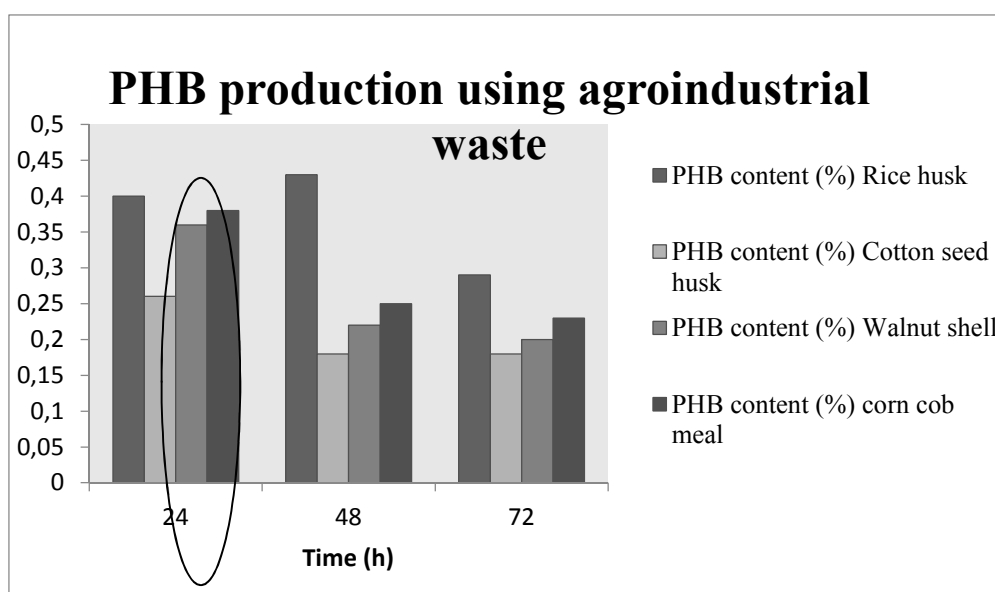


Figure : 1 Sudan black staining of PHB crystal

Table : 1 PHB production using agro-industrial waste

Agro-industrial waste	Time (h)	Cell biomass (dry weight) [g/10mL]	Dry weight PHB production [g/10mL]	PHB concentration by crotonic acid test [g/10mL]	PHB content (%)
Rice husk	24	0.50	0.1479	0.0020	0.40
	48	0.83	0.2003	0.0026	0.43
	72	0.79	0.1731	0.0023	0.29
Cotton seed husk	24	0.49	0.1135	0.0013	0.26
	48	0.95	0.1880	0.0018	0.18
	72	0.92	0.2536	0.0017	0.18
Walnut shell	24	0.50	0.1845	0.0018	0.36
	48	0.83	0.1942	0.0022	0.22
	72	0.70	0.0347	0.0014	0.20
Corn cob meal	24	0.68	0.2048	0.0022	0.38
	48	0.89	0.2290	0.0023	0.25
	72	0.84	0.2070	0.0020	0.23



Graph : 1 PHB production using agro-industrial waste

CONCLUSIONS

It was observed that Rice husk was best feedstock among the other crude source used in this experiment. But also other agro-industrial waste like cotton seed husk, walnut shell and corn cob meal can also produce PHB in significant amount. This can be exploited for the production of PHB at commercial level. Utilisation of agro-industrial materials in production of biodegradable plastic (PHB) will not only ensure the low production cost but also solve the problem of management of waste material to a certain level.

ACKNOWLEDGMENTS

First of all I express my sincere gratitude to MITCON Biopharma Center, Pune for granting me this opportunity to learn and gain a lot of information through this interesting project. Secondly, I am very much grateful to my project guide **Mrs. Priya Bande** whose valuable help, inspiration and moral support throughout the session made this project a successful one. I would also like to all staff members for their vital support. Finally, I am equally very much thankful to Parents and my friend for their continuing support.

REFERENCES

- [1] Abe, H.; Doi, Y. (2002), Molecular and material design of biodegradable poly(hydroxyl-alkonate)s', in Doi Y and Steinbuchel A, *Biopolymers 3b, Polyesters II*, Weinheim, Wiley-VCH, 105-132.
- [2] Anderson, A.J and Dawes, E. Occurrence., metabolic role and industrial use of bacterial polyhydroxyalkanolates. *Microbial. Rev.*, vol 54, pp 450-472(1990).
- [3] Article on Biodegradable Packaging for food industry by I.P. Paltani & G.K. Goyal, NDRI, Karnal.
- [4] Article on Innovative Technologies for Biodegradable Packaging by Lillian Liu, SJSU, Feb 2006.
- [5] Belma Aslim, Zehra Nur Yukesekdag, Yavuz Beyatli – Determination of PHB growth quantities of certain *Bacillus* species isolated from soil.
- [6] Buhner, J. and F.A. Agblevor, 2004. Effect of detoxification of dilute-acid corn fiber hydrolysate on xylitol production. *Applied Biochem. Biotechnol.*, 119: 13-30.
- [7] BURDON, K. L., STOKES, J. C. AND KIMBROUGH, C. E., 1942a, Studies of the common aerobic spore-forming *Bacilli* staining for fat with Sudan Black B- stain. *Journal of Bacteriology*, 43 : 717-724
- [8] Green Plastic: an introduction to the new science of biodegradable plastics (2002) by E.S. Stevens, pp 118-126.
- [9] Madison LL, Huisman GW. Metabolic engineering of poly(3-hydroxyalkanoates): From DNA to plastic. *Microbiology and Molecular Biology Reviews* 1999;63:21-53
- [10] Miller, G.L., 1959. Use of dinitrosalicylic acid reagent for determination of reducing sugar. *Anal. Chem.*, 31: 426-428.
- [11] Santimano M.C. , Nimali N. Prabhu and S. Garg. PHA production using a low cost agro industrial waste by *Bacillus* sp. Strain COL1/A6. *Research Journal of Microbiology* 4 (3): 89-96 (2009).

Impact of Social Media on Personality Development

Sultan Alzahrani and Christian Bach

Department of Biomedical Engineering,
University of Bridgeport,
Bridgeport, CT06604, USA

Copyright © 2014 ISSR Journals. This is an open access article distributed under the ***Creative Commons Attribution License***, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT: The aim of the study is to examine the impact of social media on personality development of adolescents and to identify social media factors that influence personality development. A qualitative approach has been adopted in order fully explore the subject matter without any constraints. Data was collected using only peer reviewed Journal Articles and articles from book sections. The grounded theory method was used to reach the conclusion. The findings show that use of social media is extreme in adolescents as they use not only for socializing, but also for communication, entertainment, and all the other activities. The four main social media factors that influence personality development include (i) Culture of Popularity, (ii) Unreal Standards of Appearance, (iii) Approval Seeking Behavior, and (iv) Prevalence of Depression and Anxiety. The research has two main limitations. The first limitation is that the study does not make use of primary data in forms of interviews or observation but it was made sure that only primary sources are used. Secondly, the use of qualitative approach which increases researcher bias. The findings of this study can be used to minimize the negative effects of social media on the personality development of adolescents through educational and intervention plans. The findings show that social media has an adverse effect on the personality development of adolescents. The study specifically identifies the four personality factors that are altered by the excessive use of social media. These findings can be used to develop interventions to minimize this negative impact on adolescents.

KEYWORDS: Behavior, Culture of popularity, Facebook and Anxiety.

1 INTRODUCTION

Internet and other forms of media are now deeply integrated in our daily lives and adolescents are deeply connected with this new media as they were born in a time when technology is at its peak and available for all to use. A study was conducted in the developed countries and it was found that adolescents spent most of their time using new media as compared to any other activity, second only to sleeping [9]. New media is an important part of the daily lives of adolescents and they constantly connect their offline lives with online presence and make use of multiple sources (smartphones, laptops, ipad, etc.) to stay in touch with their social networks, especially facebook and twitter.

Constant communication is the main motivation behind obsession with new media [20]. The use of new media is not limited to the internet as adolescents can be seen using multiple media simultaneously rather than taking turns [13]. Adolescents are constantly using new media for homework, socialization, and entertainment. Thus, it can be said that they are under heavy influence of social media.

1.1 ADOLESCENTS: SOCIAL AND PERSONALITY DEVELOPMENT

An important development factor during adolescents is that children become more self-conscious and become increasingly concerned about who they are. They are old enough to understand the concept of society and placing themselves in the society while maintaining their individuality at the same time. They also go through significant bodily

changes which lead to the development of self-concept. Thus, self-esteem is an important concern in people of this age because they not see themselves fit for the society or may find incongruence in their real self and ideal self.

According to Erik Erikson's Stages of Development, during adolescence, teens may face much psychological discomfort as they go through "identity crisis" [7]. He proposes that during this stage, teens' battle between identity and identity confusion as they struggle to identify personality characteristics that are unique to them [7]. Failing to develop a suitable identity can cause much distress and also have a negative impact on their social functioning in later years. The main characteristics of Adolescent years include:

1.1.1 IDENTITY ACHIEVE:

The individuals successfully develop their identity and show personality features like high motivation, self-esteem, and achievement [11].

1.1.2 MORATORIUM:

These individuals are who are in the process of seeking their true identity and spend most of their time contemplating what they should commit to in life. This process can prove to be very anxiety-provoking [11].

1.1.3 FORECLOSURE:

These types of individuals are usually conformists and authoritarian. They also seek aspiration change and have little anxiety compared to moratorium [11].

1.1.4 DIFFUSION:

Individuals falling in this category have low self-esteem and autonomy. Their identity is weak and diffused [11]. They are also easily pushed in to doing things as they don't feel strongly about anything.

2 RESEARCH METHOD

Qualitative research is "any kind of research that produces findings not arrive at by means of statistical procedure or other means of quantification" [12]. It is one of the oldest methods of conducting a scientific research and its main focus on explaining a given social phenomenon in detail. According to Patton and Cochran, "qualitative research is characterized by its aims, which relate to understanding some aspects of social life, and its methods which (in general) generate words, rather than numbers, as data"[16]. In simple words, qualitative research is used when the data is such that it cannot be interpreted numerically and requires descriptive understanding and explanation of a given concept. The method is often used when human variables like behaviors, beliefs, opinions, emotions, etc. are measured which cannot be quantitatively analyzed.

2.1 INTERVIEWS

It is one of the most common methods of data collection in qualitative research as it allows the researcher to get firsthand information about the topic [5]. It is an ideal way to obtain opinions of people and also gives an opportunity to identify factors that had not been taken in to consideration earlier [4]. Interviews may be semi-structured or in-depth and may be conducted face-to-face, online, or through telephone.

2.2 FOCUS GROUPS AND GROUP DISCUSSION

If the study is being conducted on a given focus group, a number of participants can be interviewed in groups through group discussions [8]. These sessions are interactive and participants are allowed to oppose or support a given topic and present their personal views [14]. However, it must be made sure that participants that are shy also participate in the discussion so that no one is left out [14].

2.3 OBSERVATION

This method is used when data is collected when behavior in natural environment is required. For instance, when interviewed, people may say something that they wouldn't do in real life just to seek social approval or because they don't want to seem "socially irresponsible". However, when observed in natural life, the behavior is completely authentic. The data may be collected using a video recorder or placing the researcher in the natural environment and taking notes of events as they unfold [18].

3 DATA ANALYSIS

Data analysis is the process of classifying raw data in a way that makes sense and answers the research question. In qualitative research, an important part of data analysis is to interpret the information collected from different sources and giving it meaning. For the present research, data was collected using peer-reviewed journal articles and articles from books. The grounded theory approach is used since the theory is developed from the data collected making it an inductive approach. Moreover, the subject matter is such that it requires subjective interpretation of the data collected.

4 FINDINGS

The aim of the research was to examine the impact of social media on personality development of adolescents. Adolescence is the age of rapid growth both in terms of physicality and intellectuality. Both girls and boys develop physical features that give them a sense of identity [7]. Moreover, at an intellectual level, teens begin to wonder who they really are and where do they belong. The third type of development, which takes place in this age, is the building of social relationships. Because adolescence is such a delicate stage, individuals are easily influenced by others and may go out of their way to impress others.

5 SOCIAL MEDIA FACTORS AFFECTING ADOLESCENT PERSONALITY DEVELOPMENT

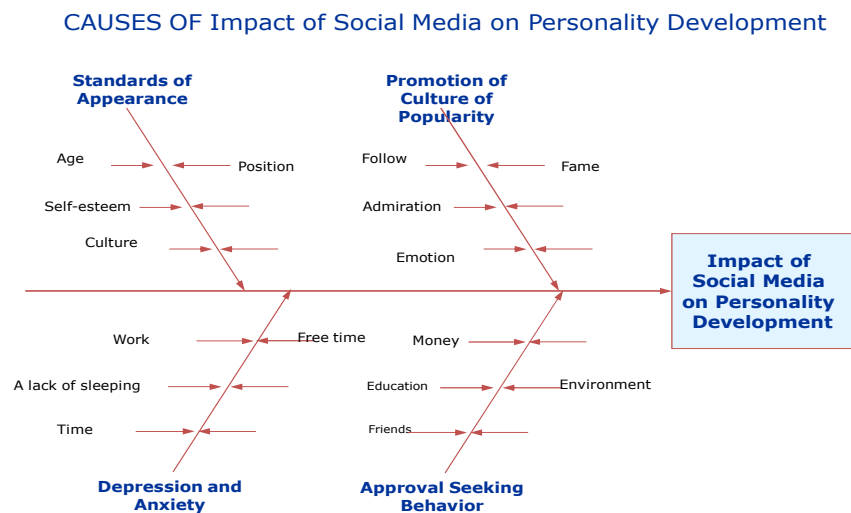


Fig.1. Social Media Factors Affecting Adolescent Personality Development and its relation to four independent variables

5.1 THE GOAL OF IMPACT SOCIAL MEDIA ON PERSONALITY DEVELOPMENT

Because the goal of the excessive use of social media by the young generation, it is impossible to keep adolescents from using it. Due to this use, the four personality factors that are affected by excessive use of social media include: Need for popularity to feel good about self [1], unreal standards of appearance [21], approval seeking behavior [6], and increasing depression and anxiety [12].

5.2 FACTOR1: PROMOTING OF SEEKING BEHAVIOUR

It must be noted that the main reason behind social networking sites is usually to extend the actual self out to the world and reach out to the society and not to promote anonymity [6]. Another factor hidden behind this vast use and obsession with social networking is to seek approval of others and gain popularity [3]. Many users of social media are obsessed with constant updating and sharing in order to gain more likes and popularity among friends [6]. Not getting the expected feedback from “friends” can result in low self-esteem [19].

5.3 FACTOR2: INCREASING DEPRESSING AND ANXIETY

It has been found that increasing use of social media also leads to depression, anxiety, and stress in adolescents [12]. A number of studies have found a correlation between heavy use of facebook and emotional distress [17]. There are a number of reasons why this is so. Firstly, the “friendships” on social networking sites are superficial and not real. Mostly people have friends on their list that they have never really met or interacted with in real life [2]. When people see on their newsfeeds how happy their “friends” are as they constantly upload pictures and statuses, they begin to feel unhappy with their life [19]. This leads to depression and anxiety as the person starts feeling like a “loner” with no active social life.

5.4 FACTOR3: UNREAL STANDARDS FOR APPEARANCE

The concept of social media popularity is well understood by anyone who uses social networking sites and thus, to gain popularity, people may go out of their way to impress others [21]. Adolescents are increasingly becoming materialists and fake on their social networking site. For instance, taking a perfect profile picture is very important for the youngsters in order to get more likes and comments from their friends [12]. Girls as young as 12 are posting suggestive pictures just to get likes while young boys are obsessed with posting pictures of their abs. Recently a 12 year old “selfie addict” attempted suicide after taking 200 pictures as none of them were “good enough” for him to be his display [15]. In order to seem attractive, people use different photo enhancing software to achieve the look of perfectionism. Seeing perfect pictures of their friends, individuals feel dissatisfied with their own appearance and make efforts to achieve an unreal standard of appearance [10].

5.5 FACTOR4: CULTURE OF POPULARITY

Social networking sites have been a popular Internet trend for the past many years. People are constantly in touch with their friends through social media and it is the dominant form of communication [1]. One major part of social networking sites is of profiles. Individuals spend much time creating profiles that are “cool” to maintain a certain social standard [12]. It has been found that these profiles and friends that people have are used to judge an individual.

Factors that decide social and physical attractiveness of a person include other attractive friends that the individual has, other people’s comments on a person’s wall, photo, or any other post, and the community association that a person has [4].

6 RESEARCH LIMITATIONS

The main limitation of the research is that it only makes use of secondary data and archival research to reach conclusions. It is thus suggested that use of primary data is made in any future research conducted on the subject matter. Another limitation of the study is that it makes use of qualitative research. While this approach allows the researcher to take into consideration extraneous factors that might influence results and have a broader view, it is subjective in nature and it requires the researcher to use personal interpretation of data to reach conclusion. However, efforts were made to keep the research subjective by making use of primary researches only and deriving conclusions from the data collected without any extended explanation.

7 PRACTICAL IMPLICATIONS

The four factors identified in the research that influence personality development in adolescents have many practical implications. Since the research proves that using social network sites is having a negative impact on the personality development of the adolescents, efforts should be made to minimize these consequences. Each factor mentioned can be further studied in detail to understand how the negative impact of social media can be reduced. For instance, efforts can be made to educate parents and school authorities about how social networking is leading to the culture of “popularity” based on materialism and giving way to unreal standards of appearance. Parents and teachers can then begin moral education of

children from an early age to help them realize that appearance is not everything as there other aspects of personality, intelligence, and good nature of a person, which should be used, judge a person.

Similarly, adolescents should be encouraged to spend more time outdoors in recreational activities to promote a healthy development. The feelings of loneliness arise in adolescents who spend several hours on social networking sites waiting for someone to communicate with them and brooding over the active lives of others. Efforts can be made on a national level to reduce the prevalence of depression and anxiety among youngsters. Furthermore, efforts can be made to identify a healthy way of using new media and introducing educational programs regarding responsible use of new media.

8 CONCLUSION

Based on the review of the literature presented above and the findings, it can be concluded that social media is having a significant impact on the personality development of adolescents. The new media is not only promoting false standards of friendship and popularity, but it also having a negative impact on the mental health of the users. Excessive use of social media is very harmful for adolescents because it is the age where identity of an individual develops and if these unreal standards of appearance are bombarded on the young mind, it can have a catastrophic effect on the entire Millennial Generation in the long run.

REFERENCES

- [1] Ahn, J. (2011). The Effect of Social Network Sites on Adolescents' Social and Academic Development: Current Theories and Controversies. *Journal of the Americal Society for Information Science and Technology*, 58(2), 1435-1445.
- [2] Becker, M. W., Alzahabi, R., & Hopwood, C. J. (2010). *Multitasking, Depression, and Anxiety*. Michigan State University .
- [3] Boyd, D. M. (2008). Why youth love social network sitres: The role of networked publics in teenage social life. In D. Buckingham, *Youth Identity and Dgital Media* (pp. 118-142). Cambridge: MIT Press.
- [4] Boyle, J., Kernohan, W., & Rush, T. (2009). When you are tired or terrified your voice slips back into its old first place: the role of feelings in community mental health practice with forensic patients. *Journal of Social Work Practice: Psychotherapeutic Approaches in Health, Welfarem and the Community*, 23(3), 291-313.
- [5] Brown, W., & Kandirikirira, N. (2007). Recovering Mental Health in Scotland. Report on Narrative Investigation of Mental Health Recovery. Scottish Recovery Network.
- [6] Correa, T., Hinsley, A. W., & Zuniga, H. G. (2009). Who interacts on the web?: The intersection of users' personality and social media use. *Elsevier: Computers in Human Behavior*, 26, 247-253.
- [7] Elkind,D.(1970).ErikErikson'sEightAgesofMan.PublishedOnline:
https://www.pdx.edu/sites/www.pdx.edu.ceed/files/sscbt_EriksonsEightAgesofMan.pdf: SSCBT.
- [8] Finch, H., & Lewis, J. (2003). Focus Groups. In J. Ritchie, & J. Lewis, *Qualitative Research Practice: a Guide for Social Science Researchers and Students* (pp. 170-198). London: SAGE Publications.
- [9] Haan, J. d., & Huysmans, F. (2004). IT/Medua yse and psychological development among Dutch youth. *IT and Society*, 2(1), 40-53.
- [10] Henderson, J. M. (2012, November 7). *Is Social Media Destroying Your Self-Esteem?* Retrieved April 8, 2014, from Forbes: <http://www.forbes.com/sites/jmaureenhenderson/2012/07/11/is-social-media-destroying-your-self-esteem/>
- [11] Kroger, J. (2004). Identity Development during Adolescence. In *Identity In Adolescence* (pp. 205-226). Taylor & Francis.
- [12] Labrague, L. J. (2014). Facebook use and adolescents' emotional states of depression, anxiety, and stress. *Health Science Journal*, 8(1), 80-89.
- [13] Livingstone, S. (2008). Taking risky opportunities in youthful content creation: Teenagers' use of social networking site for intimacy, privacy, and self-expression. *New Media and Society*, 10(3), 393-411.
- [14] Macnaghten, P., & Myers, G. (2006). Focus Groups. In C. Seale, G. Gobo, J. Gubrium, & D. Silverman, *Qualitative Research Practice: Concise Paperback Edition* (pp. 65-79). London: SAGE Publications.
- [15] Molloy, A. (2014, March 24). 'Selfie obsessed' teenager Danny Bowman suicidal after failing to capture 'the perfect selfie'. Retrieved March 31, 2013, from The Independent: <http://www.independent.co.uk/news/uk/home-news/selfie-obsession-made-teenager-danny-bowman-suicidal-9212421.html>
- [16] Patton, M. Q., & Cochran, M. (2002). *A guide to using ualitative research methodology*. Medecins Sans Frontieres.
- [17] Pearse, D. (2012, March 17). Facebooks 'dark side': study finds link to socially aggressive narcissism. Retrieved March 31, 2014, from The Guardian: http://www.theguardian.com/technology/2012/mar/17/facebook-dark-side-study-aggressive-narcissism?CMP=tw_t_gu
- [18] Pope, C., & Mays, N. (2006). Qualitative Research in Health Care. In *Qualitative Research in Health Care* (pp. 32-42). Oxford: Blackwell Publishing.

- [19] Sassen, S. (2002). "Towards a Sociology of Information Technology. *Current Sociology*, 50(3), 365-388.
- [20] Subrahmanyam, K., & Greenfield, P. (2008). Online communication and adolescent relationships. *Future of Children*, 18(1), 119-146.
- [21] Walther, J., Van Der Heide, B., Hamel, L., & Shulman, H. (2009). Self-generated versus other-generated statements and impressions in computer-mediated communication: A test of warranting theory using facebook. *Communication Research*, 36(2), 229-253.

Coronary Heart Disease

Twana Muhammed

Department of Biomedical Engineering,
University of Bridgeport
Bridgeport, CT 06604, USA

Copyright © 2014 ISSR Journals. This is an open access article distributed under the ***Creative Commons Attribution License***, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT: Coronary heart disease is dominant and very dangerous disease in the world. Coronary heart disease causes mortality in the world. CHD is very complicated because of many factors that affect this disease. The main factors effects on coronary heart disease are Cholesterol, Diabetes, Depression, and Hypertension. I believe four factors above have tremendous and direct effects on this disease. The rate of death is different according to country, age, and gender. The lack of physical activity is the same in men and women so the rate of hypertension, diabetes, and obesity more common. The main and dangerous point in coronary heart disease occurs when the coronary artery get atherosclerosis. As a result, the fat particles constrict the coronary artery so the blood, oxygen, and sufficient material don't flow to the heart completely. The main purpose of this model is to minimize the risk factors of coronary heart disease. As a result, I believe we can minimize and control this disease by doing more exercise, getting enough sleep, staying away from smoking and drinking, eating low animal products, and more eating fruit and vegetables. This paper goals to review the coronary heart disease and inquire its connections among different factors that must be taken into consideration throughout the process and how to prevent ourselves from risk factors.

KEYWORDS: Cholesterol, diabetes, depression, hypertension, mortality.

1 INTRODUCTION

Coronary heart disease is the prevalent and dangerous disease in the world wide [1]. This disease is very broad and complicated because many factors cause the risk of coronary heart disease. CHD has caused the rate of mortality and morbidity in the world. . However this rate is different according place, age, and gender [2]. Coronary heart disease in many countries is the number one of death [3]. The main and dangerous point in coronary heart disease the coronary artery gets atherosclerosis [4]. Atherosclerosis means the coronary artery because constricted or made up plagues by accumulating of fat particles in the artery [5]. . Thus sometimes sudden death, stroke, and myocardial infraction happen [6]. The most common risk factors cause coronary heart diseases are Cholesterol, Diabetes, Depression, and Hypertension.

Cholesterol is the quantity of fat in food or diet[7]. Every person naturally has cholesterol in body so cholesterol divides into parts HDL and LDL[8]. In general the amount of cholesterol is in animal products such as red meat and dairy products[9]. Indeed, the cholesterol has tremendous effect on coronary heart disease because the atherosclerosis is built up by fat particles and high level cholesterol in the body[10];[11];[12].

Diabetes is the predominant diseases in the world particularly Type 2 mellitus, and it kills disease many people suffering from it[13]. The normal range of sugar in body is 60/120 mg[14]. Diabetes has huge effect on coronary heart disease, and the rate of death is higher because the diabetes Type 2 has a strong impact on coronary artery and build up sever atherosclerosis[15]. In addition, the risk factor on the heart is higher in patients who have diabetes than in patient have not diabetes[16]. The main sign of getting diabetes is obesity[17].

Depression is predicted a risk of heart disease especially for coronary heart disease[18]. Mostly 20 % of patients who have heart problem definitely have great part of depression[19]. Depression causes mortality when the patient has acute

myocardial infarction[20]. It has been proven one out five patients with coronary heart disease have depression[21]. Stress has negative effect on whole body because during stress the physiology of body will change[22]. Depression totally increase the risk of death in patients who have heart problem [23].

Hypertension is definitely linked to the rate of death from coronary heart disease[24]. The normal blood pressure in body is 80/120 mm Hg[25]. The blood pressure has two types Systolic and Diastolic. When the blood pressure increases more than the normal range it is called hypertension[26]. For management the hypertension we should reduce the load of coronary heart disease[27]. The dangerous effect of hypertension can produce strokes[28].

Research Method

Recently combining research methods [5] p. 223 has tried to minimize the rate of death by “coronary heart disease [30] p. 826.” One form for “Rate of coronary heart disease” [2]p. 5. Is the review for coronary heart disease according age? In this research method [3] attempted to treat and detect risk factor of “coronary heart disease according gender” [6]p. 199. And [1] p. 159. The model shown here describes reduce the death rate by CHD, realizing that those patients had previous coronary heart disease and during study for diagnosis used cardiac catheterization for 1000 patients. The goal for this study used catheterization for myocardial revascularization [5] p. 226. This study focuses on atherosclerosis and how to control it. This study found many factors caused atherosclerosis like serum lipoprotein. As a result, I could not control it because many factors impact this disease [30]p. 826. I think the first study is more useful and successful for saving human life. In this study, I recognized the symptom called angina for both men and women. Therefore, the women had angina like men and controlled by anti-angina medication. As a result, risk factor of coronary heart disease is more common in women than men because women have menopause during this process the risk of CHD increase. On the other hand, after menopause cycle the high blood pressure and obesity may occur these have main effect on CHD [1]p. 159 and [3]p. 227. In this research I recognized coronary heart disease between sexes and treatment in different way for both men and women. In addition, I recognized the risk factor of obstructive and angiographic CHD in women of all ages are less than men [6] p.205. the comparison between above researches I believe the second study was successful and accomplished I agree with it because the menopause cycle have been only in women so the probability of getting risk factor of more disease particularly CHD and rate of death in women high.

2 CORONARY HEART DISEASE

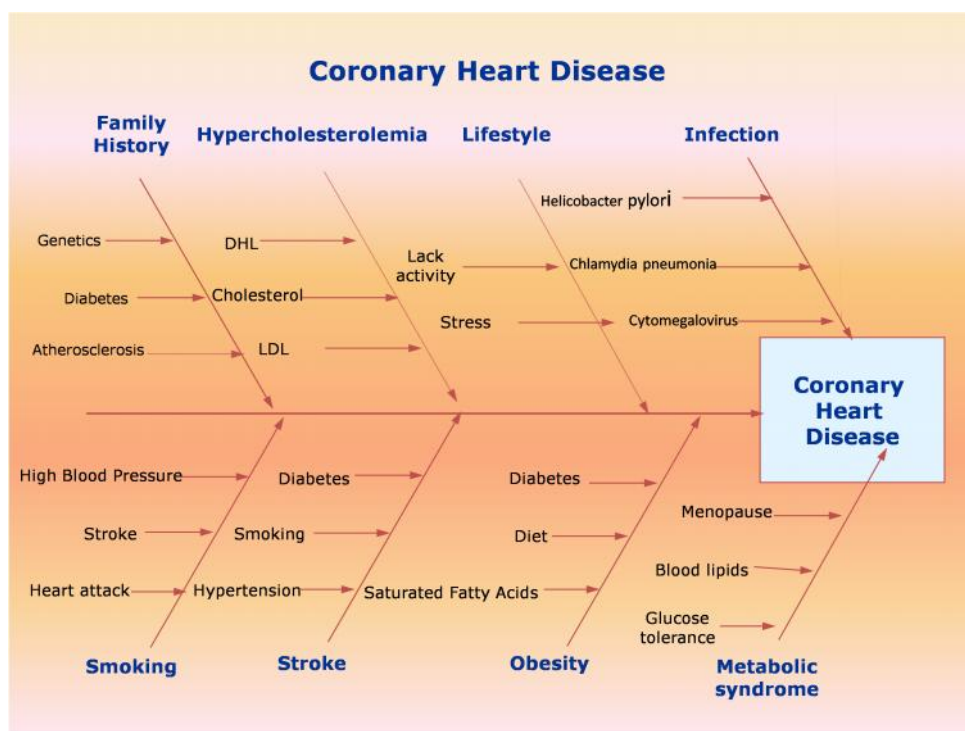


Figure 2. Coronary heart disease (CHD) critical disease factors.

3 FINDINGS AND DISCUSSION

3.1 CORONARY HEART DISEASE (CHD)

The research that has been done about coronary heart disease is definitely detailed and useful. This disease should be taken seriously because of many dangerous factors. I chose this topic because I am interested and it's very common disease in the world. It has proven coronary heart disease is the worldwide disease especially more prevalent in women than in men but traditionally same for both [1]. The finding that men in age 40-44 years every 8th man could get coronary heart disease but this rate is lower in younger women [2]. Also, it has been described coronary circulation comprise of coronary artery and vein the function of these provide oxygen and nutrient for myocardium and also remove harm or waste product. When this function has problem or is not working well until cause death [3]. We need to protect our health by doing exercise and eating more fruit and vegetables. It has been proven men and women have different structure or way and life cycle for being sick such as metabolically, therapy [6]. The mortality by coronary heart disease will increase in the world.

3.2 CHOLESTEROL

The research has been done involving cholesterol, and its main effect on coronary heart disease. This is completely true and has positive effect on cardio vascular system especially coronary heart disease because when the person eats more red meat and food containing high level of lipid. As a result, the amount of lipid accumulates in body, especially in coronary artery and constricts the artery. It has proven that high rate of cholesterol in the body has highly risk for coronary heart disease and leading cause of death [8]; [9]. The finding that men for prevention and reducing cholesterol in the body by medication using statin led. He believe statin led cause reduce rate of cholesterol thus cut down the risk of coronary heart disease; therefore, reduce death rates by coronary heart disease [10]; [12]. We know the body of human is very sensitive if we have a little bit problems we are feeling uncomfortable and pain. I totally agree with research because when the cholesterol increases in the body more than the normal rate the fat particle block oxygen and sufficient nutrient flow to the heart completely. As a result, the person feels fatigue and headache. It has been proven the remain amount of cholesterol before eating it has normal risk of coronary heart disease so independent decrease the HDL- cholesterol in the body [11]. We know before eating the rate of cholesterol usually decreases but when we eat the rate of cholesterol will change and increases.

3.2.1 DIABETES

Research has been done on the risk factors of coronary heart disease. In addition, diabetes has a common risk factor on coronary heart disease especially diabetes Type 2. This is true because we know when people have diabetes automatically they decrease physical activity; then oxidative stress in body happens and affects endothelial dysfunction particularly coronary artery. It has proven the person who has diabetes has greater risk of having CHD. [13]. I think this is true because we know if the patient who has coronary heart disease so they should reduce eating fat foods, doing exercise, taking medication, and surgery treat or reduce the risk of coronary heart disease. However, in those patients who have diabetes we cannot treat by surgery and prevention. The patient must be using medication for the rest his life. This author said people with diabetes have 2 to 4 time greater risk to coronary heart disease than patient has no diabetes and the rate of death in person has diabetes with coronary heart disease is 65-75% [4]; [14]. This is true because we know one problem better than two problems. It mean better to who has diabetes and coronary heart disease. It has been proven between two groups of patients. One has diabetes but not myocardial infraction before. The other group has myocardial infraction but they have not diabetes. As a result, in the first group, 43% have lower risk for growing coronary heart disease events compared with the second group [15]; [17]. As we know only one disease has little risk, but if we have two diseases at the same time, it will be more complicated. It has been proven the effect diabetes on coronary heart disease rate of death in female is higher than in males, statically women are 2.58, in men are 1.85 [16]. We know many factors cause the rate of death higher than men. For instance, women become pregnant, care more about her children and family and she has not enough time on herself, and stays at home thus increasing her weight.

3.3 DEPRESSION

This research has been done involving depression and that their effect on coronary heart disease. We know depression has direct effect on the whole body. Depression disturbs the physiology our bodies and secret many hormones. It has been proven depression increases the probabilities the patients will have coronary heart disease and death rates [18]. This completely makes sense because depression is associated with high level of cortisol, so this cortisol increases the blood pressure and heart beats. These are two types of depression, major and minor depression. More than 20% of coronary heart diseases have major depression. Major depression starts after one month of acute myocardial infraction [19]. We know

depression affects physiological, social and work. As we know many people when they have stress they try to decrease their stress less smoke, insomnia, drinking more, and loss of appetite by using those increases risk to coronary heart disease. It has been proven one of the most consequence of depression is an increased death rate in person already had coronary heart disease is beat to beat fluctuations in heart rate [20]. If we have depression, the physiology of our bodies will changes one of the changes in heart beat and heart rhythm, so it has negative effect on patients who have heart problem and might cause sudden death. It has been proven, that depression has more negative effects on those patient who have myocardial infraction than patients have not myocardial infraction [22]; [23]. This is true because we know when the person gets heart disease, the first advice is "Don't be stressed". The person should be relax and happy because if he is depressed the physiology all body release hormones increase heart beats and increase pressure on coronary artery, so the person will be get myocardial infraction again or sudden death.

3.4 HYPERTENSION

This research has been conducted about hypertension of coronary heart disease. Hypertension is measured by two things, which are systolic and diastolic. Hypertension has negative effect on many parts of body especially on the heart. It has been proven for control and treatment hypertension the main step is reducing the heart disease events (Perreault et al., 1999; Van Den Hoogen, Seidell, Menotti, & Kromhout, 2000; Wolf-Maier et al., 2003). I agree because we know hypertension means increase pressure so it overloads the heart artery which might rupture, causes heart failure. The author found the rate of death by hypertension is different from population to populations. For instance, the rate of death in USA and Northern Europe of 10000 people were more than 70 death per year, but the rate of death in Japan and Mediterranean Southern Europe of 10000 person was more than 20 death each year (P. C. van den Hoogen et al., 2000). This is totally make sense because we know every country has own culture. If people use more salt and lipid, the rate of hypertension is high because the people get over weight so the coronary heart disease increases and vice versa in other country. It has been proven the effect of hypertension changes according to age. The effect of systolic in young person of coronary heart disease is more powerful than diastolic in middle age (Stanley S. Franklin & Wong, 2013). We know in young age, the enough relax less, sleep less and work more, so it has a negative effect on heart. The author the found the rate of hypertension with coronary heart disease is different between men and women. During 14 years of survey of 323 men and 169 women first time got coronary heart disease. It shows in the severity and killing is more common in men than in women (Kannel, Schwartz, & McNamara, 1969). We know the hypertension appear earlier in 45 years old men but in women later. The second reason the rate of smoking and drinking more common in men.

3.5 INFECTION

The last factors appeared in organization is infection which are Chlamydia pneumonia, Helicobacter pylori, Cytomegalovirus.

3.6 SMOKING AND SMOKING

Stroke and smoking these are the most important factors effect on coronary heart disease because these are consists of High blood pressure, Heart attack, Diabetes. These have dangerous interact with coronary heart disease.

3.7 METABOLIC SYNDROME

These have dangerous interact with coronary heart disease. The role of metabolic syndrome shown in classified 10 factors which are recognized by menopause, blood lipids, and glucose tolerance.

3.8 ADDITIONAL FACTORS FOR CORONARY HEART DISEASE

Table 1. Additional factors for coronary heart disease

Additional Factors for Coronary Heart Disease	References
Overweight and obesity	[29], [30], [31], [32]
smoking	[33], [34], [35].
Lack of physical activity	[36], [37], [38].
Family history	(Nasir et al., 2004), [39], [40].
Metabolic syndrome	[41], [42], [43].
High density lipoprotein	[44],
hypercholesterolemia	[45]
diastolic blood pressure (DBP) with stroke	[46], [47], [32]
saturated fatty acids in the diet	[32]
lifestyle changes reverse coronary heart disease	[48]
(low-fat vegetarian diet, stopping smoking, stress management training, and moderate exercise)	[48]
Psychosocial factors	[49]
Menopause	[50]
Sex and age	[51]
Absence of an effect of liposuction on insulin action	[52]
Chronic Chlamydia pneumonia infection	[53]
Multivariate analysis	[54]
Tumor necrosis factor-alpha G-308 A polymorphism	[55]
Adiponectin	[56]
Estrogen replacement therapy	[57]
Hypertriglyceridemia	[58]
Plasma triglyceride	[59]
Prognostic	[60]
LDL/HDL-changes in subclinical hypothyroidism	[61]
infection with Helicobacter pylori	[62]
NT-proBNP	[63]
C-reactive protein	[64]
Use of calcium supplements	[65]
Four genetic polymorphisms of paraoxonase gene	[66]
Haptoglobin Genotype	[67]
Sex Hormones and Androgen	[68]
Homocysteine	[69]
Working hours, sleep duration	[70]
Flavonoid intake and long-term	[71]
Hyper-homocysteinemia and low pyridoxal phosphate common and independent reversible	[72]
Hyper uremia	[73]
Folate and vitamin B6 from diet and supplements	[74]
Omega-3	[75]
angiotensinogen gene T235 variant	[76]
Endothelial dysfunction, oxidative stress	[77]
Number and migratory activity of circulating endothelial progenitor cells inversely correlate	[78]
Dietary antioxidant flavonoids	[79]
Heterogeneity	[80]
Ultra-son graphically assessed carotid morphology	[81]
Dental disease	[82]
Arterial stiffness	[83]
Periodontitis	[84]
Calcification of the aortic arch	[85]
Abdominal adiposity	[86]
Very low levels of micro albuminuria	[87]
Frequent nut consumption	[88]
Vitamin E consumption	[89]
Fibrinogen, viscosity, and white blood cell count	[90]
Erectile dysfunction	[91]

3.9 DISCUSSION

There is much information about roles and effects these specific factors impact on coronary heart disease. The coronary heart disease is very complicated and common disease in the world. With mutuality of risk factors, we can reduce the mortality and morbidity of coronary heart disease. The aim or important of this model could be united with our planned model. Figure two shows the relation or conjunction of the above 10 factors categorized of considered level of effects – Hypercholesterolemia, lifestyle, infection, metabolic syndrome, obesity, high density lipoprotein, lack physical activity, family history, and stroke. This compartmentalization of factors is very useful for discussion. The main purpose of this topic is to find new ways to minimize the rate of death by coronary heart disease. Actually, this disease more complicated by having many factors effects on our bodies. Only two of the top 10 factors are connected with high level of cholesterol of coronary heart disease which are hypercholesterolemia and obesity. The hypercholesterolemia focuses on HDL, LDL, and Cholesterol. In addition, obesity focused on diet, diabetes, and saturated fatty acid. Other factors in additional Table One such as Dental disease, Arterial stiffness, Periodontitis, Calcification of the aortic arch, Abdominal adiposity, Very low levels of micro albuminuria, Frequent nut consumption, Vitamin E consumption, Fibrinogen, viscosity, and white blood cell count, Erectile dysfunction, Tumor necrosis factor-alpha G-308 A polymorphism, Adiponectin Estrogen replacement therapy, Hypertriglyceridemia, Plasma triglyceride, Prognostic, LDL/HDL-changes in subclinical hypothyroidism, NT-proBNP, C-reactive protein Use of calcium supplements, Four genetic polymorphisms of paraoxonase gene, Haptoglobin Genotype Sex Hormones and Androgen, Homocysteine, Working hours, sleep duration, Flavonoid intake and long term, Hyperhomocysteinemia and low pyridoxal phosphate common and independent reversible, Hyperuricemia, Folate and vitamin B6 from diet and supplements, Omega-3, angiotensinogen gene T235 variant, Endothelial dysfunction, oxidative stress, Number and migratory activity of circulating endothelial progenitor cells inversely correlate, Dietary antioxidant flavonoids, Heterogeneity, Ultrasonographically assessed carotid morphology, (low-fat vegetarian diet, stopping smoking, stress management training, and moderate exercise), Psychosocial factors, menopause, sex, and age ranked low or have not main effects on coronary heart disease so I don't mentioned in Table Two. Although these factors are important, that research focuses on the main factors and organized factors because they have greater or direct effect on coronary heart disease. Four out 10 factors have more important effects on coronary heart disease: - lifestyle, lack physical activity, obesity, and high density lipoprotein. These have direct effect on coronary heart disease. Another factor two of the top 10 factors are stroke and smoking. These are the most important factors that affect coronary heart disease because these are consistent with High blood pressure, Heart attack, Diabetes. These have dangerous interaction with coronary heart disease. The role of metabolic syndrome shown in 10 factors which recognized by menopause, blood lipids, and glucose tolerance. The last factors appeared in organization is infection which are Chlamydia pneumonia, Helicobacter pylori, Cytomegalovirus.

4 CONTRIBUTION AND NEW INSIGHT

This model exemplifies the factors that work to find or minimize the risk factor of coronary heart disease. The significant thing of this model is how to minimize the rate of death by coronary heart disease. CHD is a very dangerous disease of the integration between these factors: Cholesterol, diabetes, depression, hypertension, and other factors I showed in additional tables. Indeed, to control and minimize this disease many ways have been proven. Regarding cholesterol, I prefer to decrease this factor of eating those foods that it has less or low level of for example, red meat, animal products it has high level of fat instead of fatty food intake more vegetables and fruit. Another way to decrease or prevent this factor is not to drink alcohol. However, we are doing body exercise. When viewing the act of the diabetes factor, we can prevent or minimize this risk factor by losing weight, stop smoking, and eating low red meat because cholesterol has main effect for getting diabetes. Regarding depression, depression is joined with decrease exercise capability to perform in CHD patients and connect with people who have few physical activity especially in older and domicile people [19]. Thus the depression will be controlled by more relaxing, staying away from problems or trouble, physical activity, hanging out with relative, and laughter. Actually we cannot forget the effect of hypertension. High blood pressure is well set up risk factor of coronary heart disease, for treatment high blood pressure should reduction the load of coronary heart disease and doing better health life [27]. Thus the hypertension is main risk of coronary heart disease for control. This risk we can prevent our bodies from obesity, low salt intake, exercise, maintaining healthy cholesterol, and eating more sea products such as fish. Regarding other factors as I mentioned, the main things to avoid are overweight, smoking, drinking alcohol. Eating more fruits and vegetables than those foods that have high level fats, relax and getting enough sleep, more laugh, and spend more times at gym daily. Therefore, it could reduce the death rate and risk of this disease on the humanity by finding new technique for coronary heart surgery and make equipment to reduce rate of infection during surgery and publicizing on social media about risk of coronary heart disease till people know about this terrible disease.

5 CONCLUSION

Coronary heart disease is the most dangerous disease in the world wide. With this disease, the coronary artery will be constricted or narrowed thus the oxygen, blood, and other substances cannot flow to the heart completely. The common risk factors of coronary heart disease are cholesterol, diabetes, depression, and hypertension. The rate of coronary heart disease is different between man and women. On the other hand, the rate of mortality by coronary heart disease is different from place to place. In addition, the rate of getting of coronary heart disease changes according ages and in people have another disease or not. Coronary heart disease has been proven number one disease for killing people in the world especially in North Europa and North America. Family history has less effect on coronary heart disease

Cholesterol is major risk factor on coronary heart disease because the constriction in coronary artery can leads to lipid particles. As a result, it sudden death, stroke, and myocardial infraction happen. It has two types LDL and HDL, the accumulate of cholesterol caused by avoiding exercise , more eating red meat , more drink alcohol, more eating dairy products and low eating fruits and vegetables. With cholesterol many time the patient feels headache, heavily around neck, and fatigue. For control cholesterol in the body, we can take medication, exercise, and eat less animal products.

Diabetes is the very prevalent disease in the world particularly Type 2 mellitus has direct relation with coronary heart disease. If the person has diabetes the probability for getting coronary heart disease is more than the person has not diabetes about 5- 7 fold higher. The rate of diabetes is higher in women than men; thus the rate of death in women is higher than men. The main reason of diabetes is overweight and other cause of diabetes avoiding exercise, more eating sugar, the problem in pancreas while it cannot produce the insulin.

Depression is the other factor of coronary heart disease. Indeed, depression has direct effect on the whole body. When the person has depression, the physiology of body could change and dysfunction happens. The main part of the body at risk is the heart. In addition, depression is related with another disease. For example, most of people who have anxiety trying drinking, smoking, and getting medication. The good things to prevent depression are relaxing, staying away from problem, and laughing.

Hypertension is highly common factor due to mortality in those patients who have coronary heart disease in the world. Hypertension has two kinds' systolic blood pressure and diastolic blood pressure. The normal range of blood sugar in body is 120/90 mm hg. Hypertension is caused by eating more salt, obesity, eating more fatty food.

Overall, coronary heart disease is prevalent disease in the world so I believe we can prevent our bodies from this disease by doing more exercise, getting good sleep, eating healthy food such as fruits, vegetables, fish and more laugh. I read proverb that said "Happy heart is better than a full purse of money." So just laugh and enjoy your life.

REFERENCES

- [1] Tan, Y.Y., G.-C.M. Gast, and Y.T. van der Schouw, *Gender differences in risk factors for coronary heart disease*. Maturitas, 2010. **65**(2): p. 149-160.
- [2] Castelli, W., *Epidemiology of coronary heart disease: the Framingham study*. The American journal of medicine, 1984. **76**(2): p. 4-12.
- [3] Beltrame, J.F., R. Dreyer, and R. Tavella, *Epidemiology of coronary artery disease*. Coronary artery disease-current concepts in epidemiology, pathophysiology, diagnostics and treatment, 2012: p. 1-30.
- [4] Ali, M.K., K.V. Narayan, and N. Tandon, *Diabetes & coronary heart disease: current perspectives*. The Indian journal of medical research, 2010. **132**(5): p. 584.
- [5] Hertzner, N.R., et al., *Coronary artery disease in peripheral vascular patients. A classification of 1000 coronary angiograms and results of surgical management*. Annals of surgery, 1984. **199**(2): p. 223.
- [6] Wenger, N.K., *Coronary heart disease: the female heart is vulnerable*. Progress in Cardiovascular Diseases, 2003. **46**(3): p. 199-229.
- [7] Turpeinen, O., *Effect of cholesterol-lowering diet on mortality from coronary heart disease and other causes*. Circulation, 1979. **59**(1): p. 1-7.
- [8] Troisi, A., *Cholesterol in coronary heart disease and psychiatric disorders: same or opposite effects on morbidity risk?* Neuroscience & Biobehavioral Reviews, 2009. **33**(2): p. 125-132.
- [9] Ebrahim, S., et al., *Cholesterol and coronary heart disease: screening and treatment*. Quality in health care: QHC, 1998. **7**(4): p. 232.
- [10] Després, J.-P., et al., *HDL-cholesterol as a marker of coronary heart disease risk: the Quebec cardiovascular study*. Atherosclerosis, 2000. **153**(2): p. 263-272.
- [11] Varbo, A., et al., *Remnant cholesterol as a causal risk factor for ischemic heart disease*. Journal of the American College of Cardiology, 2013. **61**(4): p. 427-436.

- [12] Cromwell, W.C., *High-density lipoprotein associations with coronary heart disease: Does measurement of cholesterol content give the best result?* Journal of clinical lipidology, 2007. **1**(1): p. 57-64.
- [13] Saely, C.H. and H. Drexel, *Is type 2 diabetes really a coronary heart disease risk equivalent?* Vascular pharmacology, 2013. **59**(1): p. 11-18.
- [14] Hu, F.B., et al., *The impact of diabetes mellitus on mortality from all causes and coronary heart disease in women: 20 years of follow-up.* Archives of Internal Medicine, 2001. **161**(14): p. 1717-1723.
- [15] Bulughapitiya, U., et al., *Is diabetes a coronary risk equivalent? Systematic review and meta-analysis.* Diabetic Medicine, 2009. **26**(2): p. 142-148.
- [16] Lee, W.L., et al., *Impact of diabetes on coronary artery disease in women and men: a meta-analysis of prospective studies.* Diabetes care, 2000. **23**(7): p. 962-968.
- [17] Haffner, S.M., et al., *Mortality from coronary heart disease in subjects with type 2 diabetes and in nondiabetic subjects with and without prior myocardial infarction.* New England Journal of Medicine, 1998. **339**(4): p. 229-234.
- [18] Carney, R.M. and K.E. Freedland, *Depression in patients with coronary heart disease.* The American journal of medicine, 2008. **121**(11): p. S20-S27.
- [19] Carney, R.M., et al., *Depression as a risk factor for cardiac mortality and morbidity: a review of potential mechanisms.* Journal of psychosomatic research, 2002. **53**(4): p. 897-902.
- [20] Goldston, K. and A.J. Baillie, *Depression and coronary heart disease: a review of the epidemiological evidence, explanatory mechanisms and management approaches.* Clinical psychology review, 2008. **28**(2): p. 288-306.
- [21] Rugulies, R., *Depression as a predictor for coronary heart disease: a review and meta-analysis* 1 The full text of this article is available via AJPM Online at www.ajpm-online.net. American journal of preventive medicine, 2002. **23**(1): p. 51-61.
- [22] Rowan, P.J., et al., *Depressive symptoms have an independent, gradient risk for coronary heart disease incidence in a random, population-based sample.* Annals of epidemiology, 2005. **15**(4): p. 316-320.
- [23] Poole, L., C. Dickens, and A. Steptoe, *The puzzle of depression and acute coronary syndrome: reviewing the role of acute inflammation.* Journal of psychosomatic research, 2011. **71**(2): p. 61-68.
- [24] Perreault, S., et al., *Impact of treating hyperlipidemia or hypertension to reduce the risk of death from coronary artery disease.* Canadian Medical Association Journal, 1999. **160**(10): p. 1449-1455.
- [25] van den Hoogen, P.C., et al., *The relation between blood pressure and mortality due to coronary heart disease among men in different parts of the world.* New England Journal of Medicine, 2000. **342**(1): p. 1-8.
- [26] Franklin, S.S. and N.D. Wong, *Hypertension and Cardiovascular Disease: Contributions of the Framingham Heart Study.* Global Heart 2013. **8**(1): p. 49-57.
- [27] Franklin, S.S., et al., *Does the relation of blood pressure to coronary heart disease risk change with aging? The Framingham Heart Study.* Circulation, 2001. **103**(9): p. 1245-1249.
- [28] Kannel, W.B., M.J. Schwartz, and P.M. McNamara, *Blood pressure and risk of coronary heart disease: the Framingham study.* CHEST Journal, 1969. **56**(1): p. 43-52.
- [29] Manson, J.E., et al., *A prospective study of obesity and risk of coronary heart disease in women.* New England Journal of Medicine, 1990. **322**(13): p. 882-889.
- [30] Bibbins-Domingo, K., et al., *Adolescent overweight and future adult coronary heart disease.* New England Journal of Medicine, 2007. **357**(23): p. 2371-2379.
- [31] Li, T.Y., et al., *Obesity as compared with physical activity in predicting risk of coronary heart disease in women.* Circulation, 2006. **113**(4): p. 499-506.
- [32] Keys, A., *Coronary heart disease in seven countries.* Circulation, 1970. **41**(1): p. 186-195.
- [33] Critchley, J.A. and S. Capewell, *Mortality risk reduction associated with smoking cessation in patients with coronary heart disease: a systematic review.* Jama, 2003. **290**(1): p. 86-97.
- [34] He, J., et al., *Passive smoking and the risk of coronary heart disease—a meta-analysis of epidemiologic studies.* New England Journal of Medicine, 1999. **340**(12): p. 920-926.
- [35] Doyle, J.T., et al., *The relationship of cigarette smoking to coronary heart disease: The second report of the combined experience of the Albany, NY, and Framingham, Mass, studies.* Jama, 1964. **190**(10): p. 886-890.
- [36] Taylor, R.S., et al., *Exercise-based rehabilitation for patients with coronary heart disease: systematic review and meta-analysis of randomized controlled trials.* The American journal of medicine, 2004. **116**(10): p. 682-692.
- [37] Powell, K.E., et al., *Physical activity and the incidence of coronary heart disease.* Annual review of public health, 1987. **8**(1): p. 253-287.
- [38] Rodriguez, B.L., et al., *Physical activity and 23-year incidence of coronary heart disease morbidity and mortality among middle-aged men. The Honolulu Heart Program.* Circulation, 1994. **89**(6): p. 2540-2544.
- [39] Silberberg, J.S., et al., *Risk Associated with Various Definitions of Family History of Coronary Heart Disease The Newcastle Family History Study II.* American journal of epidemiology, 1998. **147**(12): p. 1133-1139.

- [40] Marenberg, M.E., et al., *Genetic susceptibility to death from coronary heart disease in a study of twins*. New England Journal of Medicine, 1994. **330**(15): p. 1041-1046.
- [41] Lakka, H.-M., et al., *The metabolic syndrome and total and cardiovascular disease mortality in middle-aged men*. Jama, 2002. **288**(21): p. 2709-2716.
- [42] Wannamethee, S.G., et al., *Metabolic syndrome vs Framingham Risk Score for prediction of coronary heart disease, stroke, and type 2 diabetes mellitus*. Archives of Internal Medicine, 2005. **165**(22): p. 2644-2650.
- [43] Sattar, N., et al., *Metabolic syndrome with and without C-reactive protein as a predictor of coronary heart disease and diabetes in the West of Scotland Coronary Prevention Study*. Circulation, 2003. **108**(4): p. 414-419.
- [44] Gordon, T., et al., *High density lipoprotein as a protective factor against coronary heart disease: the Framingham Study*. The American journal of medicine, 1977. **62**(5): p. 707-714.
- [45] Group, S.S.S.S., *Randomised trial of cholesterol lowering in 4444 patients with coronary heart disease: the Scandinavian Simvastatin Survival Study (4S)*. The Lancet, 1994. **344**(8934): p. 1383-1389.
- [46] MacMahon, S., et al., *Blood pressure, stroke, and coronary heart disease: part 1, prolonged differences in blood pressure: prospective observational studies corrected for the regression dilution bias*. The Lancet, 1990. **335**(8692): p. 765-774.
- [47] Wilson, P.W., et al., *Prediction of coronary heart disease using risk factor categories*. Circulation, 1998. **97**(18): p. 1837-1847.
- [48] Ornish, D., et al., *Can lifestyle changes reverse coronary heart disease?: The Lifestyle Heart Trial*. The Lancet, 1990. **336**(8708): p. 129-133.
- [49] Haynes, S., M. Feinleib, and W.B. Kannel, *The relationship of psychosocial factors to coronary heart disease in the Framingham Study. III. Eight-year incidence of coronary heart disease*. American journal of epidemiology, 1980. **111**(1): p. 37-58.
- [50] Matthews, K.A., et al., *Menopause and risk factors for coronary heart disease*. New England Journal of Medicine, 1989. **321**(10): p. 641-646.
- [51] Jousilahti, P., et al., *Sex, age, cardiovascular risk factors, and coronary heart disease A prospective follow-up study of 14 786 middle-aged men and women in Finland*. Circulation, 1999. **99**(9): p. 1165-1172.
- [52] Klein, S., et al., *Absence of an effect of liposuction on insulin action and risk factors for coronary heart disease*. New England Journal of Medicine, 2004. **350**(25): p. 2549-2557.
- [53] Saikku, P., et al., *Chronic Chlamydia pneumoniae infection as a risk factor for coronary heart disease in the Helsinki Heart Study*. Annals of internal medicine, 1992. **116**(4): p. 273-278.
- [54] Wilhelmsen, L., H. Wedel, and G. TIBBLIN, *Multivariate analysis of risk factors for coronary heart disease*. Circulation, 1973. **48**(5): p. 950-958.
- [55] Chu, H., et al., *Tumor necrosis factor-alpha G-308 A polymorphism and risk of coronary heart disease and myocardial infarction: A case-control study and meta-analysis*. Journal of Cardiovascular Disease Research, 2012. **3**(2): p. 84-90.
- [56] Ai, M., et al., *Adiponectin: An independent risk factor for coronary heart disease in men in the Framingham offspring Study*. Atherosclerosis, 2011. **217**(2): p. 543-548.
- [57] Stampfer, M.J. and G.A. Colditz, *Estrogen replacement therapy and coronary heart disease: a quantitative assessment of the epidemiologic evidence*. Preventive medicine, 1991. **20**(1): p. 47-63.
- [58] Fontbonne, A., et al., *Hypertriglyceridaemia as a risk factor of coronary heart disease mortality in subjects with impaired glucose tolerance or diabetes*. Diabetologia, 1989. **32**(5): p. 300-304.
- [59] Austin, M.A., *Plasma triglyceride as a risk factor for coronary heart disease. The epidemiologic evidence and beyond*. American journal of epidemiology, 1989. **129**(2): p. 249-259.
- [60] Schächinger, V., M.B. Britten, and A.M. Zeiher, *Prognostic impact of coronary vasodilator dysfunction on adverse long-term outcome of coronary heart disease*. Circulation, 2000. **101**(16): p. 1899-1906.
- [61] Althaus, B., et al., *LDL/HDL-CHANGES IN SUBCLINICAL HYPOTHYROIDISM: POSSIBLE RISK FACTORS FOR CORONARY HEART DISEASE*. Clinical endocrinology, 1988. **28**(2): p. 157-163.
- [62] Danesh, J. and R. Peto, *Risk factors for coronary heart disease and infection with Helicobacter pylori: meta-analysis of 18 studies*. Bmj, 1998. **316**(7138): p. 1130-1132.
- [63] Sattar, N., et al., *NT-proBNP is associated with coronary heart disease risk in healthy older women but fails to enhance prediction beyond established risk factors: Results from the British Women's Heart and Health Study*. Atherosclerosis, 2010. **209**(1): p. 295-299.
- [64] Mojiminiyi, O.A., et al., *Association of C-reactive protein with coronary heart disease risk factors in patients with type 2 diabetes mellitus*. Diabetes Research and Clinical Practice, 2002. **58**(1): p. 37-44.
- [65] Pentti, K., et al., *Use of calcium supplements and the risk of coronary heart disease in 52-62-year-old women: The Kuopio Osteoporosis Risk Factor and Prevention Study*. Maturitas, 2009. **63**(1): p. 73-78.

- [66] Wang, M., et al., *Four genetic polymorphisms of paraoxonase gene and risk of coronary heart disease: A meta-analysis based on 88 case-control studies*. *Atherosclerosis*, 2011. **214**(2): p. 377-385.
- [67] Cahill, L.E., et al., *Haptoglobin Genotype Is a Consistent Marker of Coronary Heart Disease Risk Among Individuals With Elevated Glycosylated Hemoglobin*. *Journal of the American College of Cardiology*, 2013. **61**(7): p. 728-737.
- [68] Cao, J., et al., *Sex Hormones and Androgen Receptor: Risk Factors of Coronary Heart Disease in Elderly Men*. *Chinese Medical Sciences Journal*, 2010. **25**(1): p. 44-49.
- [69] Shai, I., et al., *Homocysteine as a risk factor for coronary heart diseases and its association with inflammatory biomarkers, lipids and dietary factors*. *Atherosclerosis*, 2004. **177**(2): p. 375-381.
- [70] Cheng, Y., et al., *Working hours, sleep duration and the risk of acute coronary heart disease: A case-control study of middle-aged men in Taiwan*. *International Journal of Cardiology*, 2014. **171**(3): p. 419-422.
- [71] Hertog, M.G., et al., *Flavonoid intake and long-term risk of coronary heart disease and cancer in the seven countries study*. *Archives of Internal Medicine*, 1995. **155**(4): p. 381.
- [72] Robinson, K., et al., *Hyperhomocysteinemia and low pyridoxal phosphate common and independent reversible risk factors for coronary artery disease*. *Circulation*, 1995. **92**(10): p. 2825-2830.
- [73] Brand, F., et al., *Hyperuricemia as a risk factor of coronary heart disease: The Framingham Study*. *American journal of epidemiology*, 1985. **121**(1): p. 11-18.
- [74] Rimm, E.B., et al., *Folate and vitamin B6 from diet and supplements in relation to risk of coronary heart disease among women*. *Jama*, 1998. **279**(5): p. 359-364.
- [75] Harris, W.S. and C. von Schacky, *The Omega-3 Index: a new risk factor for death from coronary heart disease?* *Preventive medicine*, 2004. **39**(1): p. 212-220.
- [76] Katsuya, T., et al., *Association of angiotensinogen gene T235 variant with increased risk of coronary heart disease*. *The Lancet*, 1995. **345**(8965): p. 1600-1603.
- [77] Heitzer, T., et al., *Endothelial dysfunction, oxidative stress, and risk of cardiovascular events in patients with coronary artery disease*. *Circulation*, 2001. **104**(22): p. 2673-2678.
- [78] Vasa, M., et al., *Number and migratory activity of circulating endothelial progenitor cells inversely correlate with risk factors for coronary artery disease*. *Circulation research*, 2001. **89**(1): p. e1-e7.
- [79] Hertog, M.G., et al., *Dietary antioxidant flavonoids and risk of coronary heart disease: the Zutphen Elderly Study*. *The Lancet*, 1993. **342**(8878): p. 1007-1011.
- [80] Bhopal, R., et al., *Heterogeneity of coronary heart disease risk factors in Indian, Pakistani, Bangladeshi, and European origin populations: cross sectional study*. *Bmj*, 1999. **319**(7204): p. 215-220.
- [81] Salonen, J.T. and R. Salonen, *Ultrasonographically assessed carotid morphology and the risk of coronary heart disease*. *Arteriosclerosis, Thrombosis, and Vascular Biology*, 1991. **11**(5): p. 1245-1249.
- [82] DeStefano, F., et al., *Dental disease and risk of coronary heart disease and mortality*. *BMJ: British Medical Journal*, 1993. **306**(6879): p. 688.
- [83] Mattace-Raso, F.U., et al., *Arterial stiffness and risk of coronary heart disease and stroke the rotterdam study*. *Circulation*, 2006. **113**(5): p. 657-663.
- [84] Beck, J.D., et al., *Periodontitis: a risk factor for coronary heart disease?* *Annals of periodontology*, 1998. **3**(1): p. 127-141.
- [85] Iribarren, C., et al., *Calcification of the aortic arch: risk factors and association with coronary heart disease, stroke, and peripheral vascular disease*. *Jama*, 2000. **283**(21): p. 2810-2815.
- [86] Rexrode, K.M., et al., *Abdominal adiposity and coronary heart disease in women*. *Jama*, 1998. **280**(21): p. 1843-1848.
- [87] Klausen, K., et al., *Very low levels of microalbuminuria are associated with increased risk of coronary heart disease and death independently of renal function, hypertension, and diabetes*. *Circulation*, 2004. **110**(1): p. 32-35.
- [88] Hu, F.B., et al., *Frequent nut consumption and risk of coronary heart disease in women: prospective cohort study*. *Bmj*, 1998. **317**(7169): p. 1341-1345.
- [89] Rimm, E.B., et al., *Vitamin E consumption and the risk of coronary heart disease in men*. *New England Journal of Medicine*, 1993. **328**(20): p. 1450-1456.
- [90] Yarnell, J., et al., *Fibrinogen, viscosity, and white blood cell count are major risk factors for ischemic heart disease. The Caerphilly and Speedwell collaborative heart disease studies*. *Circulation*, 1991. **83**(3): p. 836-844.
- [91] Feldman, H.A., et al., *Erectile dysfunction and coronary risk factors: prospective results from the Massachusetts male aging study*. *Preventive medicine*, 2000. **30**(4): p. 328-338.

Determination of the Anti-nutrient Composition of *Ocimum gratissimum*, *Corchorus olitorius*, *Murraya koenigii* Spreng and *Cucurbita maxima*

J.C. Ifemeje, C. Egbuna, J.O. Eziokwudiaso, and F.C. Ezebuo

Department of Biochemistry, Faculty of Science,
Anambra State University Uli, Nigeria

Copyright © 2014 ISSR Journals. This is an open access article distributed under the **Creative Commons Attribution License**, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT: The present study investigates the anti-nutrient composition of *Ocimum gratissimum*, *Corchorus olitorius*, *Murraya koenigii* Spreng and *Cucurbita maxima* following standard methods. Anti-nutritional factors are chemical substances which act to reduce nutrient intake, digestion, absorption and utilization of nutrients which may accumulate in the body to toxic level if the diet is not varied. The qualitative analysis revealed the presence of flavonoids, cardiac glycosides, alkaloids, tannins and phenols in the plant leaves using methanol, ethanol, and petroleum ether as extraction solvents except for saponins in which water was used as the extraction solvent. The differences in mean values were statistically significant at $p < 0.05$. The highest level of anti-nutrients were found in the following order: flavonoids (7.20 ± 0.15 %) in *Cucurbita maxima*; cardiac glycosides (13.01 ± 0.03 %) in *Ocimum gratissimum*; alkaloids (8.82 ± 0.08 %) in *Ocimum gratissimum*; phytates (0.06 ± 0.00 %) in *Corchorus olitorius*; haemagglutinins (1.06 ± 0.00 mg/l) in *Cucurbita maxima*; saponins (9.26 ± 0.20 %) in *Cucurbita maxima*; tannins (1.45 ± 0.03 %) in *Corchorus olitorius*; oxalates (1.07 ± 0.07 %) in *Murraya koenigii*; and phenols (0.68 ± 0.02 mg/l) in *Corchorus olitorius*. However, the level of anti-nutrients in these plant leaves falls within safe level but should be consumed with care to prevent over-accumulation.

KEYWORDS: Anti-nutrients, *Ocimum gratissimum*, *Corchorus olitorius*, *Murraya koenigii* Spreng, *Cucurbita maxima*.

1 INTRODUCTION

Plants are known to be the chief producer of food substances since time immemorial. However, besides the basic nutrients known to be produced by plants which primarily helps in the generation of energy for body metabolism, growth and reproduction, plants produces chemical substances which acts to reduce nutrient intake, digestion, absorption and utilization of nutrients which may accumulate in the body to harmful level if the diet is not varied [1], [2].

In the most general sense, medicinal plants serves as resource for drugs in traditional systems of medicine, modern medicines, nutraceuticals, food supplements, folk medicines, pharmaceutical intermediates and chemical entities for synthetic drugs [3]. These plants contain bioactive compounds that exhibited physiological activities against bacteria and other microorganisms [4], [5].

It is however pertinent to state that, it is the anti-nutrients in plants that confer to them its medicinal properties. For instance, a 2011 study of girinimbine, a carbazole alkaloid isolated from *Murraya koenigii*, found that it inhibited the growth and induced apoptosis in human hepatocellular carcinoma, HepG2 cells *in vitro* [6]. It is in this light however that the following four plant leaves, *Ocimum gratissimum* (Common name: Scent leaf; family: lamiaceae), *Corchorus olitorius* (family: Malvaceae), *Murraya koenigii* (Common name: Curry; family: Rutaceae) and *Cucurbita maxima* (family: Cucurbitaceae) was analysed to determine the level of the antinutrient they contain.

2 MATERIALS AND METHODS

2.1 SAMPLE COLLECTION

The plant leaves were collected from nearby farmland close to Anambra State University, Uli, Nigeria. The leaves were identified at Biological Science Department of Anambra State University.

2.2 SAMPLE PREPARATION

Plant materials were washed separately under running tap water, followed by distilled water. The washed plant leaves was oven dried, then ground to a fine powder and stored.

2.3 METHODS FOR QUALITATIVE ANALYSIS

2.3.1 DETECTION OF FLAVONOIDS

Five ml of dilute ammonia solution were added to a portion of the aqueous filtrate of each plant extract followed by addition of concentrated H_2SO_4 . A yellow colouration observed in each extract indicated the presence of flavonoids. The yellow colouration disappeared on standing [4], [7].

2.3.2 DETECTION OF CARDIAC GLYCOSIDES (KELLER-KILLANI TEST)

Five ml of each extracts was treated with 2 ml of glacial acetic acid containing one drop of ferric chloride solution. This was underlaid with 1 ml of concentrated sulphuric acid. A brown ring of the interface indicates a deoxysugar characteristic of cardenolides. A violet ring may appear below the brown ring, while in the acetic acid layer, a greenish ring may form just gradually throughout thin layer [8].

2.3.3 DETECTION OF ALKALOIDS (HAGER'S TEST)

Extracts were dissolved individually in dilute Hydrochloric acid and filtered. Filtrates were treated with Hager's reagent (saturated picric acid solution). The presence of alkaloids is confirmed by the formation of yellow coloured precipitate [9].

2.3.4 DETECTION OF SAPONINS (FOAM TEST)

About 0.5 gm of extract was shaken with 2 ml of water. If foam produced persists for ten minutes it indicates the presence of saponins. Few drops of olive oil was added to 0.5g of the extract and vigorously shaken. Formation of soluble emulsion in the extract indicates the presence of saponin [10].

2.3.5 DETECTION OF TANNINS

First, about 1 ml of the ethanol extract was added in 2 ml of water in a test tube. 2 to 3 drops of diluted ferric chloride solution was added and observed for green to blue-green (cathechic tannins) or a blue-black (gallic tannins) coloration [11].

2.3.6 DETECTION OF PHENOLS: FERRIC CHLORIDE TEST

Extracts were treated with 3-4 drops of ferric chloride solution. Formation of bluish black colour indicates the presence of phenols [9].

2.4 METHODS FOR QUANTITATIVE ANALYSIS

2.4.1 DETERMINATION OF FLAVONOID

The method of Boham and Kocipai-Abyazan (1974) was used in which 10g of the plant sample was extracted with 100 ml of 80% aqueous methanol at room temperature and allow to stand for like 5 to 10 minutes. The whole solution was filtered

through whatman filter paper No. 42 (125 mm). The filtrate was later transferred into a crucible and evaporated to dryness and weighed to a constant weight. The percentage flavonoid was calculated by difference.

$$\% \text{ flavonoids} = \frac{W_2 - W_1}{Wt \text{ of sample}} \times 100$$

Where, W_1 = Weight of empty crucible

W_2 = Weight of crucible + residue

2.4.2 DETERMINATION OF PHYTATE

The phytate content were determined using the method of Young and Greaves (1940) as adopted by Reference [13]. Two hundred milligram (0.2 g) of the sample was weighed into different 250 ml conical flasks. Each sample was soaked in 100 ml of 2 % conc. HCL for 3hrs. The sample was then filtered. Fifty (50) mls of each filtrate was laced in 250 ml beaker and 100 ml distilled water added to each sample. Ten (10) ml of 0.3 % ammonium thiocyanate solution was added as indicator and titrated with standard iron (III) chloride solution which contained 0.00195 g iron per 1 ml.

$$\% \text{ Phytic acid} = \frac{\text{Titre value} \times 0.00195 \times 1.19}{2} \times 100$$

2.4.3 CARDIAC GLYCOSIDE

To 1 g of sample in a beaker, add 5 ml of aqueous methanol and allow to stand for 10 minutes. From the mixture take 1 ml of the extract to a 100 ml beaker and add 1 ml of 2 % solution of 3,5-DNS (Dinitro salicylic acid) and 1 ml of 5 % aqueous NaOH. Boil for 2 minutes in a water bath at 95 – 100°C until brick red precipitate is observed (Note: a change in colour from yellow to brick red indicates a positive result). Weigh an empty Whatman filter paper No. 42(125 mm) and use it to filter the boiled sample. Take the filter paper with the absorbed residue and dry in an oven at 50°C till dryness and reweigh the filter paper. The percentage cardiac glycoside was calculated.

$$\% \text{ Cardiac Glycosides} = \frac{(\text{Wt of filter paper} + \text{residue}) - (\text{Wt of filter paper})}{\text{Wt of sample}} \times 100$$

2.4.4 DETERMINATION OF HAEMAGLUTININ

Two (2g) of sample was placed in a beaker and 20 ml of 0.9 NaCl was added and allowed to stand for 1 hour. Do not filter. Divide the mixture into 4 centrifuge tubes and centrifuge at 2000 rpm (revolution per minute) for 10 minutes. Carefully decant the supernatant from the 4 centrifuge tube into a beaker and filter using Whatman filter paper No. 42(125 mm). The supernatant were collected as crude agglutination extract and absorbance read at 420 nm [14].

$$\text{Conc. of Sample} = \frac{\text{Absorbance of Sample} \times \text{Conc. of standard}}{\text{Absorbance of Standard}}$$

2.4.5 DETERMINATION OF ALKALOIDS

Five (5g) of the plant sample was placed in a 250ml beaker and 200ml of 10% acetic acid ($\text{CH}_3\text{CO}_2\text{H}$) in ethanol ($\text{C}_2\text{H}_5\text{OH}$) was added. The mixture was covered and allowed to stand for 4 hours at 25°C i.e. at room temperature. It was then filtered with filter paper No. 42 and the filtrate was concentrated on a water bath until it reaches a quarter of its original volume. Concentrated NH_4OH was added drop wise until precipitation was complete. The mixture was allowed to settle and the precipitate collected on a weighed filter paper and washed with dilute NH_4OH . The precipitate, alkaloid, was dried and weighed. The percentage alkaloid was calculated by difference [7], [15].

$$\% \text{ Alkaloids} = \frac{W_2 - W_1}{Wt \text{ of sample}} \times 100$$

Where, W_1 = Weight of empty filter paper
 W_2 = Weight of filter paper + Alkaloid

2.4.6 DETERMINATION OF TOTAL SAPONINS

Five (5g) of the sample was put into 20 % acetic acid in ethanol and allowed to stand in a water bath at 50°C for 24 hours. This was filtered and the extract was concentrated using a waterbath to one-quarter of the original volume. Concentrated NH_4OH was then added drop-wise to the extract until the precipitate was complete. The whole solution was allowed to settle and the precipitate was collected by filtration and weighed. The saponin content was weighed and calculated in percentage [15].

$$\% \text{ Saponins} = \frac{W_2 - W_1}{\text{Wt of sample}} \times 100$$

Where, W_1 = Weight of filter paper
 W_2 = Weight of filter paper + residue

2.4.7 DETERMINATION OF TOTAL TANNIN BY TITRATION

The Follin Denis titrating method as described by Reference [16] was used. To 20 g of the crushed sample in a sample conical flask was added 100 ml of petroleum ether and covered for 24 hours. The sample was then filtered and allowed to stand for 15 minutes allowing petroleum ether to evaporate. It was then re-extracted by soaking in 100 ml of 10 % acetic acid in ethanol for 4 hours. The sample was then filtered and the filtrate collected. 25 ml of NH_4OH were added to the filtrate to precipitate the alkaloids. The alkaloids were heated with electric hot plate to remove some of the NH_4OH still in solution. The remaining volume was measured to be 33 ml. 5 ml of this was taken and 20 ml of ethanol was added to it. It was titrated with 0.1 M NaOH using phenolphthalein as indicator until a pink end point is reached. Tannin content was then calculated in % ($C_1V_1 = C_2V_2$) molarity. Where, C_1 = Conc. of tannic acid, C_2 = Conc. of base, V_1 = volume of tannic acid and V_2 = Volume of base.

2.4.8 DETERMINATION OF OXALATE BY TITRATION METHOD

This determination involves three major steps viz digestion, oxalate precipitation, and permanganate titration [17].

1. Digestion

- 2 g of sample was suspended in 190 ml of distilled water in a 250 ml volumetric flask.
- 10 ml of 6M HCL was added and the suspension digested at 100°C for 1 hour.
- Cool and then make up to 250 ml mark before filtration.

2. Oxalate precipitation

Duplicate portions of 125 ml of the filtrate were measured into beakers and 4 drops of methyl red indicator added. This was followed by the addition of NH_4OH solution (dropwise) until the test solution changes from salmon pink colour to a faint yellow colour (pH 4-4.5). Each portion was then heated to 90°C, cooled and filtered to remove precipitate containing ferrous ion. The filtrate was again heated to 90°C and 10 ml of 5 % CaCl_2 solution was added while being stirred constantly. After heating, it is cooled and left overnight at 25°C. The solution is then centrifuged at 2500 rpm for 5 minutes. The supernatant is decanted and the precipitate completely dissolved in 10 ml of 20 % (v/v) H_2SO_4 solution.

3. Permanganate titration

At this point, the total filtration resulting from digestion of 2 g of flour was made up to 300 ml. Aliquots of 125 ml of the filtrate was heated until near boiling and then titrated against 0.05 M standardized KMnO_4 solution to a faint pink colour which persists for 30 sec. The calcium oxalate content was then calculated using the formula.

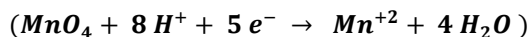
T = Titre value

Vme = Volume of mass equivalent (i.e. 1 ml of 0.05 M KMnO_4 solution is equivalent to 0.00225 g anhydrous oxalic acid).

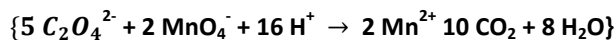
Df = Dilution factor V_t/A (2.4 where V_t is the total volume of titrate (300 ml) and A is the aliquot used (125 ml).

ME = The molar equivalent of KMnO_4 in oxalate (KMnO_4 redox +5 reaction).

Mf = The mass of sample used.



The equation for the reaction between oxalate and permanganate is



$$\text{Conc. of Oxalate} = \frac{T \times V_{\text{me}} \times D_f \times 10^5}{\text{ME} \times \text{Mf}} \text{ (mg/100g)}$$

2.4.9 DETERMINATION OF TOTAL PHENOLS BY SPECTROPHOTOMETRIC METHOD

The fat free sample was boiled with 50 ml of diethylether ($\text{CH}_3\text{CH}_2)_2\text{O}$. 5 ml of the boiled extract was pipetted into a 50 ml flask, then 10 ml of distilled water was added. After the addition of distilled water, 2 ml of ammonium hydroxide solution and 5 ml of concentrated amylalcohol ($\text{CH}_3(\text{CH}_2)_3\text{CH}_2\text{OH}$), were also added. The samples were made up to mark and left to react for 30 min for colour development. This was measured at 505 nm [8].

$$\text{Conc. of Sample (mg/l)} = \frac{\text{Absorbance of Sample} \times \text{Conc. of Sample}}{\text{Absorbance of Standard}}$$

3 STATISTICAL ANALYSIS AND DATA PROCESSING

One-way analysis of variance (ANOVA) was conducted on each of processing methods and Least Significant Difference (LSD) test at significant level of $p < 0.05$ was performed using SPSS version 17 software for windows to compare the difference between treatment means. The results were expressed as means \pm standard deviation of three separate determinations.

4 RESULTS AND DISCUSSION

The qualitative analysis for the four leaf extracts is shown in Table 1 which was carried out following standard procedures. Flavonoids were found to be present in all the ethanolic extracts. *Corchorus olitorius*, *Murraya koenigii*, and *Cucurbita maxima* contained cardiac glycosides with *Ocimum gratissimum* containing the highest cardiac glycoside which is in conformity with the results of the quantitative analysis presented in Table 2 as well as those reported by [2]. Alkaloids, tannins, saponins and phenols were also present in the leaf extracts.

The amount of phytochemicals found in the four leaf extracts was quantitatively determined by standard procedures and expressed as mean \pm standard deviation of three determination. However, analysis revealed that *Cucurbita maxima*, *Murraya koenigii* contained $7.20 \pm 0.15 \%$, $7.20 \pm 0.02 \%$ flavonoids whilst *Corchorus olitorius* and *Ocimum gratissimum* has $7.02 \pm 0.03 \%$ and $5.40 \pm 0.02 \%$ respectively. The relatively low toxicity of flavonoids compared to other active plant compounds like alkaloids means that many animals, including humans could ingest significant quantities in their diet. In vitro studies showed that flavonoids have anti-allergic, anti-inflammatory, anti-microbial [18] and anti-diarrheal activities [19].

Ocimum gratissimum contained the highest concentration of cardiac glycosides in the tune of $13.00 \pm 0.03 \%$ which justifies its use in the treatment of congestive heart failure and cardiac arrhythmia though the dosage must be controlled carefully, since the therapeutic dose is close to its toxic dose [20]. The alkaloids content of the plants leaf was found in the following order *Ocimum gratissimum* ($8.82 \pm 0.08 \%$), *Cucurbita maxima* ($8.40 \pm 0.10 \%$), *Muraya koenigii* ($7.60 \pm 0.02 \%$) and *Corchorus olitorius* as ($7.21 \pm 0.04 \%$). The result justified the medicinal value of *Ocimum gratissimum*. In higher concentration, alkaloids could be toxic especially when it exceeds the lethal dose of 20 mg/100g [14]. The highest level of phytate was found in *Corchorus olitorius* ($0.06 \pm 0.00 \%$) with *Ocimum gratissimum* ($0.01 \pm 0.00 \%$) as the least. For best health, phytate should be lowered as much as possible, ideally to 25 mg or less per 100 grams or to about 0.03 % of the phytate containing food eaten. At this level, micronutrient losses are minimized. Reference [14] stated that the lethal dose of phytate is 50-60 mg/kg.

Relatively low concentration of haemagglutinin was found in the extracts. The highest haemagglutinin content was found in *Cucurbita maxima* as 1.06 ± 0.00 mg/l which is far below the lethal dose of 50 mg/kg [14]. The highest saponins content was recorded in *Cucurbita maxima*. Generally saponins are toxic, but Reference [21] showed that consumption of saponins by human beings may be beneficial in reducing heart disease (by binding of saponins with plasma membrane and cholesterol).

The percentage concentration of tannin was recorded at the highest level in *Corchorus olitorius* as leaf extracts contained tannin in appreciable amount. The lethal dose of tannin was reported to be 30mg/kg [14]. The highest concentration of oxalate was found in the leaf of *Murraya koenigii* which serves as a caution in its consumption as oxalates chelates metals. The toxic dose was reported to be 2.5 g/kg [14]. The highest phenol content was found in *Corchorus olitorius* (0.68 ± 0.02 mg/l).

Table 1. Qualitative Analysis For Four Plant Leaves

	<i>Ocimum gratissimum</i>			<i>Corchorus olitorius</i>			<i>Murraya koenigii</i>			<i>Cucurbita maxima</i>		
	Met.	Eth.	Pet.	Met.	Eth.	Pet.	Met.	Eth.	Pet.	Met.	Eth.	Pet.
Flavonoids	-	+	-	+	+	-	-	+	-	-	+	-
Cardiac												
Glycosides	+++	++	+	-	++	++	+	++	+	+	++	-
Alkaloids	+	+	-	+	-	-	+	-	+	+	-	-
Tannins	+	++	+	++	+	-	-	++	+	+	++	-
Phenols	+	++	+	-	+	-	-	+	-	+	++	-
<i>For saponin screening, leaf extracts was gotten using distilled water only</i>												
Saponins	+++			++			+			++		

Key: -, Not present; +, present at low concentration; ++, present at moderate concentration; +++, present at high concentration.
Met. =Methanol, **Eth.** = Ethanol, **Pet.** = Petroleum ether.

Table 2. Quantitative Analysis For Four Plant Leaves

Phytochemicals	<i>Ocimum gratissimum</i>	<i>Corchorus olitorius</i>	<i>Murraya koenigii</i>	<i>Cucurbita maxima</i>
Flavonoids (%)	5.40 ± 0.02^d	7.02 ± 0.03^c	7.20 ± 0.02^a	7.20 ± 0.15^b
Cardiac Glycosides (%)	13.01 ± 0.03^a	8.03 ± 0.06^d	9.04 ± 0.05^c	11.05 ± 0.05^b
Alkaloids (%)	8.82 ± 0.08^a	7.20 ± 0.04^d	7.60 ± 0.02^c	8.40 ± 0.10^b
Phytates (%)	0.01 ± 0.00^d	0.06 ± 0.00^a	0.04 ± 0.00^b	0.03 ± 0.00^c
Haemagglutinins (mg/l)	0.51 ± 0.00^b	0.43 ± 0.00^c	0.29 ± 0.00^d	1.06 ± 0.00^a
Saponins (%)	5.24 ± 0.06^d	6.00 ± 0.00^c	6.40 ± 0.01^b	9.26 ± 0.20^a
Tannins (%)	0.86 ± 0.00^d	1.45 ± 0.03^a	0.97 ± 0.02^b	0.93 ± 0.01^c
Oxalates (%)	0.92 ± 0.12^b	0.17 ± 0.00^d	1.07 ± 0.07^a	0.19 ± 0.00^c
Phenols (mg/l)	0.42 ± 0.02^c	0.68 ± 0.02^a	0.48 ± 0.01^b	0.30 ± 0.00^d

Values were expressed as Mean \pm Standard Deviation of three Determinations. Means within a row followed by different superscript letters are statistically significant by LSD (Least Significance Difference) test at $p < 0.05$.

5 CONCLUSION AND RECOMMENDATION

The level of antinutrients found in the four leaf extracts are within safe level and the moderate consumption would be very vital in improving health conditions and could serve as a source for useful drugs. However, since no one method is completely efficient in determining the chemical composition for a particular phytochemical and the fact that environmental conditions could influence the level of the phytochemical in the plant, we recommend that research into this field should be carried out randomly as often as possible with adaptable methods within the reach of the investigator.

REFERENCES

- [1] Norman, N.P. *Food Science*. CBS Publishers and Distributors, P. 780, 1987.
- [2] F.I. Abdurahman, M.A. Tijani, and U. Osuji, Proximate content and chemical composition of *Ocimum viridis* Leaf and *Ocimum gratissimum* leaf. *International Research Journal of Pharmacy*, vol. 3, no.4, pp. 153-156, 2012.
- [3] N.S. Ncube, A.J. Afolayan, and A.I. Okoh, Assessment techniques of antimicrobial properties of natural compounds of plant origin: current methods and future trends. *African Journal of Biotechnology*, vol, 7, no 12, pp. 1797-1806, 2008.
- [4] Sofowora, A., *Medicinal plants and Traditional Medicine in Africa*. Spectrum Books Limited, Ibadan, Nigeria; P. 289, 1993.
- [5] D.E. Okwu, Evaluation of the chemical composition of indigenous species and flavouring agents. *Global Journal of Pure and Applied Sci.*, vol. 7, no. 3, pp. 455-459, 2001.
- [6] S. Syam, A.B. Abdul, M.A. Sukari, S. Mohan, S.I. Abdelwahab, and T.S. Wah, The Growth Suppressing Effects of Girinimbine on Hepg2 Involve Induction of Apoptosis and Cell Cycle Arrest. *Molecules*, vol 16, no. 8, pp. 7155–70, 2011.
- [7] J.B. Harborne, *Phytochemical methods*. Chapman and Hall, Ltd, London; pp. 49-188, (1973).
- [8] H.O. Edeoga, D.E. Okwu, and B.O. Mbabie, Phytochemical Constituents of some Nigerian Medical Plants. *Afr J Biotechnol*. Vol 4, pp. 685-688, 2005.
- [9] T. Prashant, K. Bimlesh, K. Mandeep, K. Gurpreet, and K. Harleen, Phytochemical Screening and Extraction: A Review. *Internationale Pharmaceutica Scientia (An International Peer Review Journal)*; vol 1, no. 1, pp. 98-106, 2011.
- [10] A. Odebiyi, and J.A. Sofowora, Phytochemical screening of nigerian medicinal plants parts II liodyia, vol. 403, pp. 234-246, 1978.
- [11] F.Z. Sabri, M. Belarbi, S. Sabri, and M.M.S. Alsayadi, Phytochemical Screening and Identification of some Compounds from Mallow. *J. Nat. Prod. Plant Resource*, vol. 2, no. 4, pp. 512-516, 2012.
- [12] B.A. Boham, and A.C. Kocipai, Flavonoids and condensed tannins from leaves of *Hawaiian vaccinium vaticulatum* and *V. calycinium*. *Pacific Sci.*; vol. 48 pp. 458-463, 1974.
- [13] G.M. Lucas, and P. Markakes, Phytic acid and other phosphorus compounds of navy bean (*Phaseolous vulgaris*). *J. Agric., Food Chem.*, vol. 23, pp. 13-15, 1975.
- [14] H.M. Inuwa, V.O. Aina, B.G.I. Aimola, and T. Amao, Comparative Determination of Antinutrient Factors in Groundnut Oil, Palm Oil. *Advanced Journal of Food Science and technology*, vol 3, no. 4, pp 275-279, 2011.
- [15] B. Obdoni, and P. Ochuko, Phytochemical studies and comparative efficacy of the crude extracts of some homostatic plants in Edo and Delta States of Nigeria. *Global J. Pure Appl. Sci.*, vol. 8, pp. 203–208, 2001.
- [16] D. Pearson, *Chemical Analysis of Foods*, 7th eds. Church Hill Living stone London; Pp. 7-11, 1976.
- [17] Oke, O.L., *Oxalic Acid in Plants and in Nutrition*, In: S. Karget Based (ed), World Review of Nutrition and Dietetics, p. 262, 1969.
- [18] T.P.T. Cushnie, and A.J. Lamb, Recent advances in understanding the antibacterial properties of flavonoids. *International Journal of Antimicrobial Agents*, vol. 38, no. 2, pp. 99–107, 2011.
- [19] M. Schuier, H. Sies, B. Illek, and H. Fischer, Cocoa-related flavonoids inhibit CFTR-mediated chloride transport across T84 human colon epithelia. *J. Nutr.* Vol. 135, no. 10, pp. 2320–2325, 2005.
- [20] Denwick, P.M. *Natural Products: A Biosynthetic Approach*, 2nd Edn. John Wiley and sons Ltd, England, pp. 241-243, 2002.
- [21] K.R. Price, I.T. Johnson, and G.R. Fenwick, The chemistry and biological significance of saponins in foods and feed stuffs. *CRC Critical Reviews Food Sci. Nut.*, vol. 26, pp. 27-35, 1987.

قلق المستقبل وعلاقته بدرجة التوافق مع الحياة الجامعية لدى عينة من طالبات جامعة الطائف بفرع تربة

[Future Anxiety And Its Relation With Adjustment Of University In A Sample Of Al-Taif University Students, Turbah's Branch]

Samia Bint Mohammed Bin Hawqan Alboqami

سامية بنت محمد بن حوقان البقمي

Educational postgraduate Program
King Abdulaziz University
Jeddah - Kingdom of Saudi Arabia

برنامج الدراسات العليا التربوية
جامعة الملك عبد العزيز
جدة - المملكة العربية السعودية

إشراف

Dr. Khadija Ahmed Alsaid Bekhait

أ/د. خديجة أحمد السيد بخيت

Professor
College of Education

أستاذ
كلية التربية

Dr. Mesoon Naem Mejahid Ouda

د. ميسون نعيم مجاهد عودة

Assistant Professor
King Abdulaziz University

أستاذ مساعد
جامعة الملك عبد العزيز

Dr. Khadija Mohammed Ameen Khouja

د. خديجة محمد أمين خوجه

Associate Professor
King Abdulaziz University

أستاذ مشارك
جامعة الملك عبد العزيز

مشروع بحثي مقدم لنيل درجة الماجستير في قسم علم النفس التربوي / التوجيه والإرشاد التربوي

الفصل الدراسي الثاني
رجب 1435هـ - مايو 2014م

ABSTRACT: The purpose of the present study is twofold (a) to investigate sort of relation between future anxiety and its relation with adjustment of university in a sample of Al-Taif university students, Turbah's branch, (b) to examine differences in female-students' scores shown by Future anxiety scale & Adjustment of University scale in view of SPECIALIZATION FIELD (literary or scientific section) VARIANT as well as GRADE (grade 1, grade 2 or grade 3 & etc) VARIANT. Thus, the researcher utilized the correlative descriptive and the Causal Comparative methodology. Current research applied Zainab M. Shuqair Future Anxiety Scale (2005) & Baker Adjustment of University scale (2008). A total of 200 female-students of faculty of arts and faculty of science were selected as a sample by Stratified Random sampling technique.

The Study Reached The Following Results:

1. There is a positive correlative relation of statistical significance at (0.01) level among life problems based- anxiety, health & death anxiety, future anxiety from one hand and emotional adjustment (from the other hand).
2. There is a passive correlative relation of statistical significance at (0.01) level among mental anxiety, anxiety of failure in future, future anxiety and goal attainment duty.
3. There are not any differences of statistical significance at (0.05) level in view of results of Future anxiety scale & Adjustment Of University scale and according to SPECIALIZATION FIELD and GRADE variant (Future despair dimension was excluded from future anxiety score).

The researcher recommended to establish Psychology Counseling center in universities to render counseling services for the benefit of students in a way that enable them to adjust with university and protecting them from psychological disorders.

KEYWORDS: Future Anxiety, Adjustment of University, Al-Taif University, Students.



نَرْفَعُ دَرَجَاتٍ مِّنْ نَّشَأٍ ﴿١﴾
وَفَوْقَ كُلِّ ذِي عِلْمٍ عَلِيمٌ ﴿٢﴾

سورة يوسف آية (٧٦)

الإهداء

أتقدم بإهداء هذا البحث عرفاناً بالجميل
إلى من أعطوا كلَّ العطاء
إلى من بذلوا و جادوا بسخاء.....
إلى من أفنوا عمرهم في سبيل تربيتي وتعليمي دون ثناء.....
إلى والدي ووالدتي أطال الله عمركما
إلى سندي وقوتي وملأني بعد الله....إخوتي وأخواتي
إلى كلِّ باحثٍ عن المعرفة والعلم
إلى هذا الصَّرح العلمي المتميز....جامعة الملك عبد العزيز
أسأل الله أن يسدد فيه الخطوات ويقلل فيه العثرات ويتقبله إنَّه جوادٌ كريمٌ..

الشكر والتقدير

الحمد لله على تمام فضله وإحسانه والشكر له على توفيقه وامتنانه والصلاة والسلام على محمد الداعي إلى رضوانه وعلى آله وأصحابه الذين ساروا على هديه وتبياناه وبعد:

أشكر الله وحده على توفيقه وإحسانه وفضله للانتهاج من هذا البحث سائلةً الله عزَّ وجلَّ أن يبارك فيه وأتني بالشكر لجامعة الملك عبد العزيز ممثلةً ببرنامجه الدراسات العليا التربوية الذي أتاح لي فرصة مواصلة دراستي الأكاديمية، كما أتقدم بالشكر الجزيل وعظيم الامتنان والتقدير إلى أستاذتي الفاضلة الدكتورة / خديجة أحمد السيد بخيت اعترافاً بفضلها وعلمها ولما بذلته لي من توجيه وآراء سديدة ولما غمرتني به من علم غزير وخلق فاضل نبيل أثناء إشرافها على هذا البحث، سائلةً الله عزَّ وجلَّ أن يرفع قدرها ويعلي منزلتها في الدنيا والآخرة، كما أتقدم بخالص الشكر والتقدير لسعادة الأستاذة الدكتورة / خديجة محمد خوجه وسعادة الدكتورة / ميسون عودة على تفضلهما بالموافقة على مناقشة هذا البحث وإثرائه بأرائهن السديدة وملاحظتهن العلمية القيمة . كما يسعدني أن أتقدم بوافر الشكر والتقدير لأستاذاتي أعضاء هيئة التدريس بقسم علم النفس التربوي على ما قدّموه من جهد مشكور أثناء دراستي بالقسم، كما أتقدم بجزيل الشكر والعرفان لزميلاتي في مرحلة الماجستير على تشجيعهن ومساندتهن كما لا يفوتني أن أقدم شكري وتقديري إلى والدي الغالي ووالدتي الغالية وإخوتي ذوي الفضل عليّ والذين تحمّلوا من أجلي الكثير على مدار سنوات دراستي وأسأل الله أن يجزيهم عني خير الجزاء . والشكر موصول لكل من وقف بجانبه وجهده ووقته في إتمام هذا البحث، وفي الختام أحمد الله تعالى الذي أعانني على إتمام هذا البحث، فإن أصبت فمن الله وإن أخطأت فمن نفسي وصلى الله على نبيّنا محمد وعلى آله وصحبه وسلّم تسليماً كثيراً والحمد لله رب العالمين .

مستخلص الدراسة

قلق المستقبل وعلاقته بدرجة التوافق مع الحياة الجامعية لدى عينة من طالبات جامعة الطائف بفرع تربية

هدفت الدراسة إلى تحديد نوع العلاقة بين قلق المستقبل ودرجة التوافق مع الحياة الجامعية لدى عينة من طالبات جامعة الطائف بفرع تربية، وتحديد الفروق في درجات الطالبات في كل من مقياس قلق المستقبل بأبعاده المختلفة ومقياس درجة التوافق مع الحياة الجامعية بأبعاده المختلفة يرجع إلى متغير التخصص الدراسي (العلمي / الأدبي)، والفرقة الدراسية (الأولى / الرابعة)، وطبقت مقياس (شقير، 2005) لقياس قلق المستقبل، ومقياس (بيكر و سبرك تعريب عبد السلام، 2008) لقياس درجة التوافق مع الحياة الجامعية، واختيرت عينة قوامها (200) طالبة من كلية الآداب وكلية العلوم، وتوصلت الدراسة إلى النتائج التالية :

- ❖ وجود علاقة ارتباطية موجبة ذات دلالة إحصائية عند مستوى معنوية 0.01 بين كل من القلق المتعلق بالمشكلات الحياتية، وقلق الصحة والموت، وقلق المستقبل ككل ؛ وبين التوافق العاطفي.
- ❖ وجود علاقة ارتباطية سالبة ذات دلالة إحصائية عند مستوى معنوية 0.01 بين كل من القلق الذهني، والقلق من الفشل في المستقبل، وقلق المستقبل ككل ؛ وبين الالتزام بتحقيق الأهداف .
- ❖ لا توجد فروق ذات دلالة إحصائية عند مستوى معنوية 0.05 بين متوسطات درجات أفراد عينة الدراسة في مقياس قلق المستقبل بأبعاده المختلفة و في مقياس التوافق مع الحياة الجامعية بأبعاده المختلفة تبعاً لمتغير التخصص الدراسي، وكذلك تبعاً لمتغير الفرقة الدراسية ماعدا بعد اليأس في المستقبل بالنسبة لمقياس قلق المستقبل وكان لصالح الفرقة الأولى.

وأوصت الباحثة بضرورة إنشاء مركز الإرشاد النفسي في الجامعة لتقديم الخدمات الإرشادية للطالبات من أجل توعيتهن ووقايتهن من الاضطرابات النفسية ولتحسين قدرتهن على التوافق مع الحياة الجامعية.

قائمة المحتويات

الفصل الأول: المدخل إلى الدراسة
أولاً : مقدّمة الدراسة
ثانياً: مشكلة الدراسة
ثالثاً: أهمية الدراسة
❖ الأهمية النظرية
❖ الأهمية التطبيقية
رابعاً: أهداف الدراسة
خامساً: مصطلحات الدراسة
الفصل الثاني : الإطار النظري
أولاً: قلق المستقبل
❖ مفهوم القلق
❖ تصنيفات القلق
❖ أعراض القلق
❖ مفهوم قلق المستقبل
❖ الطبيعة المعرفية لقلق المستقبل
❖ النظريات العلمية المفسرة لقلق المستقبل
❖ أسباب قلق المستقبل
❖ سمات ذوي قلق المستقبل
ثانياً: التوافق مع الحياة الجامعية
❖ مفهوم التوافق
❖ الخطوات الأساسية في عملية التوافق
❖ مجالات التوافق
❖ مستويات التوافق
❖ مفهوم التوافق مع الحياة الجامعية
❖ النظريات العلمية المفسرة للتوافق
❖ أبعاد التوافق مع الحياة الجامعية
أولاً: الدراسات التي تناولت قلق المستقبل
ثانياً: الدراسات التي تناولت التوافق مع الحياة الجامعية
ثالثاً: التعليق العام على الدراسات السابقة
رابعاً: فروض الدراسة
أولاً : منهج الدراسة
ثانياً: عينة الدراسة
ثالثاً: أدوات الدراسة
رابعاً: أساليب المعالجة الإحصائية
خامساً: إجراءات الدراسة
أولاً: نتائج الدراسة ومناقشتها وتفسيرها
❖ عرض وتحليل النتائج المتعلقة بالفرض الأول ومناقشتها
❖ عرض وتحليل النتائج المتعلقة بالفرض الثاني ومناقشتها
❖ عرض وتحليل النتائج المتعلقة بالفرض الثالث ومناقشتها
❖ عرض وتحليل النتائج المتعلقة بالفرض الرابع ومناقشتها
❖ عرض وتحليل النتائج المتعلقة بالفرض الخامس ومناقشتها
ثانياً: ملخص نتائج الدراسة
ثالثاً: توصيات الدراسة
رابعاً: البحوث والدراسات المقترحة

الفصل الأول

المدخل إلى الدراسة

أولاً : مقدّمة الدراسة

يعتبر الخوف والقلق من المستقبل من سمات هذا العصر، فالتغيرات السريعة المتلاحقة في شتى مناحي الحياة، ساهمت في جعل الإنسان يقف حائراً، قلقاً، يبحث عن الطمأنينة وسكينة النفس فلا يجدها.

ولقد المستقبل ظاهرة تستحق الدراسة، خاصة لدى طلاب الجامعة، لأن الحياة الجامعية تزخر بالظروف المثيرة للقلق، سواء على الصعيد الدراسي أو الاجتماعي، وتنعكس خطورة ظاهرة قلق المستقبل سلباً على إدراك طلاب الجامعة؛ لفاعليتهم وقدراتهم الذاتية وطموحهم المستقبلي مما يجعلهم عرضة للاضطرابات النفسية والسلوكية والتكيف غير الفعال. (المشيخي، 2009)

كما أن أهمية المرحلة الجامعية تكمن في أنها مرحلة حاسمة في حياة الطالب، حيث تتضح شخصيته خلال فترة إعداده الأكاديمي، ثم يخرج وهو مزود بخبرات نفسية ومهنية واجتماعية، تمكنه من وضع أهداف لمواجهة متطلبات الحياة، والمساهمة في نهضة الوطن وتقدمه.

وذكر الليل(2005) أن التوافق مع الحياة الجامعية يعد مطلباً أساسياً لنجاح الطلاب واستمرارهم في الدراسة؛ لاسيما أن التوافق مع الحياة الجامعية يعد مؤشراً على توافقيهم العام، أما سوء التوافق فيدل على أن هناك حاجات غير مشبعة لدى الطلاب داخل البيئة الجامعية، فينعكس أثر ذلك في تدني الأداء أثناء فترة التعلم وما بعدها.

وبواجه الطالب الجامعي تحديات كثيرة، مثل التوافق الأكاديمي والعاطفي والمهني، وكل هذه التحديات في ظل المشكلات الاقتصادية والأسرية، تبعث الإحساس بالقلق. (بدر، 1993)

ومما لاشك فيه أن القلق يؤثر بشكل كبير على الفرد ويحد من إمكانياته ويكون سبباً رئيسياً في عدم تحقيق أهدافه المستقبلية، و عدم تحقيق السعادة الهائلة للفرد وبالتالي يؤثر على علاقاته الاجتماعية وتوافقه النفسي والاجتماعي والمهني. (معشي، 2011)

ويعد التفكير الناتج عن قلق المستقبل سبباً مهماً في تزايد التوتر والاضطرابات، ونقص الأمن النفسي، والثقة بالنفس، وهذا يؤدي بدوره إلى ضعف العلاقات الاجتماعية.

ولاشك أن لحالة ضعف الأمن النفسي التي قد يصاب بها الطالب الجامعي آثاراً خطيرة، منها شعوره بتدني قدرته على ضبط الأحداث والتنبؤ بها، مما يدفعه إلى العجز والاستسلام وضعف الدافع للإنجاز لديه، فيميل إلى الانسحاب والانزلال والاكتئاب وينظر إلى العالم من حوله على أنه مصدر تهديد. (Seligman & Garber، 1989)

إن للقلق علاقة عكسية مع سعادة الفرد وراحته، ويؤدي إلى كثير من الاضطرابات الجسمية والنفسية والاجتماعية. (الصرايرة و الحجابيا، 2008)

لذا فإنه من الملاحظ أن دراسة القلق وعلاقته بكثير من المتغيرات، حظيت باهتمام من قبل الباحثين في المجالين النفسي والتربوي، فالكثير من الدراسات النفسية، تهتم بدراسة القلق، وتقدم نظريات تحاول تفسير مصادره وأسبابه ونتائجه، وتضعه في تصنيفات مختلفة. (حسان، 2009) ؛ ومنها دراسة الصبوه وآخرين (1991) التي توصلت إلى أن أهم المشكلات النفسية للطلاب سواء في التخصصات العلمية أو الإنسانية، والطلاب المتفوقين والمتأخرين دراسياً وطلاب السنة الأولى والنهاية، ولكلا الجنسين هي القلق من الامتحانات، يليها القلق من المستقبل، ثم الشعور بالذنب .

ولذلك من المهم، دراسة قلق المستقبل وعلاقته بحياة الفرد الجامعية، وما تتطلبه من التزامات وتوافق نفسي واجتماعي وأكاديمي. حيث يتميز الطلاب المتوافقون مع الحياة الجامعية بأبعادها المختلفة بالإيجابية، والنضج والثبات الانفعالي، والقدرة على مواجهة أحداث الحياة الضاغطة، ولديهم دافعية للإنجاز الأكاديمي. (عبد الجابر، فايد، 2010)

وعليه فإن توافق الطالب مع متطلبات الحياة الجامعية، يتأثر بمهاراته الشخصية، وقدراته العقلية، وظروفه الاجتماعية، ونظرته للمستقبل، وطبيعة الحياة الجامعية بما فيها من قوانين، وتعليمات وعلاقات اجتماعية وخدمات تساعد الطالب على التوافق معها. (Dupoux & Wolman، Estrada، 2006)

وفي ضوء ما سبق يمكن القول " إن القلق مشكلة حقيقية تترك الطلاب الجامعيين، وتؤثر على صحتهم النفسية، وتحد من قدراتهم، ودافعيتهم للتعلم، وتزيد من قلق المستقبل لديهم". (المصري، 2011)، وكل هذا قد يؤثر على توافق الطالب مع الحياة الجامعية التي تعد بالنسبة للطلاب تجربة جديدة مختلفة عن التجارب السابقة؛ ففيها الكثير من المشكلات والخبرات الجديدة، التي تتطلب منهم اجتيازها ومواجهتها والتكيف معها، كالتعرف على أنظمة الجامعة ولوائحها، واختيار التخصص والتكيف معه، والاختيار المهني والإعداد لمهنة المستقبل، ولاسيما وأن الجامعة تعطي طلبتها حرية أوسع ومسؤولية أكبر بعكس المدرسة. (حسن، صالح، 2006)، ولذا ترى الباحثة ضرورة إجراء هذه الدراسة، حيث لم يتم إجراؤها مسبقاً.

ثانياً : مشكلة الدراسة

تتضح مشكلة الدراسة من خلال أن " قلق المستقبل يمثل أحد أنواع القلق التي تؤثر على حياة الفرد، لذلك يعتبر قلق المستقبل موضوعاً خصباً ومن المواضيع الحديثة، حيث أن الإنسان بطبيعته، يتأمل وينظر ويخاف من عدم وضوح مستقبله مما يؤدي إلى إحباطه. (المصري، 2011)، و لقلّة التركيز من قبل الباحثين في مجال الإرشاد النفسي والتربوي على دور التوافق مع الحياة الجامعية خاصة، إن طلاب الجامعة أكثر عرضة لمواجهة الكثير من الضغوط النفسية، نتيجة للمواقف والأحداث الكثيرة والمتعددة التي يواجهونها في حياتهم الجامعية. (Constance، 2004)

وفي ظل الظروف المجتمعية والاقتصادية الحالية المتمثلة في زيادة متطلبات الحياة، وارتفاع تكاليف المعيشة، وقلة فرص العمل، وظهور مشكلة البطالة، أصبحت الفتيات الجامعيات في حيرة وقلق بشأن مستقبلهن، وهل سيكون هناك وظيفة، و زواج وتكوين أسرة؟؟، مما يؤدي إلى الشعور باليأس، والذي يؤثر على التوافق مع

الحياة الجامعية، ونظراً لعدم توفر مركز إرشادي للطالبات في الجامعة، ازدادت الحاجة لمثل هذه الدراسة، ومن هنا يشكّل قلق المستقبل وعلاقته بدرجة التوافق مع الحياة الجامعية مشكلة تستحق البحث والدراسة في البيئة الجامعية السعودية.

وتحدد مشكلة هذه الدراسة في الإجابة عن السؤال الرئيسي التالي:

- ما علاقة قلق المستقبل بدرجة التوافق مع الحياة الجامعية، لدى عينة من طالبات جامعة الطائف بفرع تربة ؟
و تتطلب الإجابة عن السؤال الرئيسي الإجابة عن الأسئلة الفرعية التالية:

- 1- ما نوع العلاقة بين درجات مقياس قلق المستقبل ودرجات مقياس التوافق مع الحياة الجامعية لدى عينة من طالبات جامعة الطائف بفرع تربة ؟
- 2- هل توجد فروق ذات دلالة إحصائية، بين متوسطات درجات مقياس قلق المستقبل بأبعاده المختلفة، لدى عينة الدراسة تبعاً لمتغيري التخصص الدراسي (العلمي - الأدبي) والفرقة الدراسية (الأولى - الرابعة)؟
- 3- هل توجد فروق ذات دلالة إحصائية، بين متوسطات درجات مقياس التوافق مع الحياة الجامعية بأبعاده المختلفة، لدى عينة الدراسة، تبعاً لمتغيري التخصص الدراسي (العلمي - الأدبي) و الفرقة الدراسية (الأولى - الرابعة)؟

ثالثاً : أهمية الدراسة

تستمد الدراسة أهميتها من خلال الموضوع الذي تتناوله والمتعلق بالتعرف على العلاقة بين قلق المستقبل ودرجة التوافق مع الحياة الجامعية لدى طالبات جامعة الطائف بفرع تربة ويمكن تحديد أهمية الدراسة في النقاط التالية:

❖ الأهمية النظرية :

- تأتي أهمية دراسة متغير التوافق مع الحياة الجامعية بأبعاده النفسية والاجتماعية بوصفه أمراً حيوياً ومفيداً، لأنه يعدّ من أكثر المؤشرات المتعلقة بصحة الطالبة النفسية حيث أن الطالبة تقضي مدة طويلة في الجامعة لا تقلّ عن أربع سنوات، وأن توافيقها مع مناخ الجامعة وشعورها بالرضا والارتياح يمكن أن ينعكس على إنتاجيتها .
- تكمن أهمية الدراسة، في أنها تهتم بشريحة مهمة في المجتمع السعودي، " الفتيات الجامعيات"، كونهن الركيزة الأساسية التي يتشكل منها مجتمع الغد بكل تفاصيله، مما يفرض على الباحثين التعرف على سماتهن وآمالهن ومخاوفهن، كما تكمن أهمية المرحلة الجامعية، في أنها البداية للاعتماد على الذات وتحمل المسؤولية .
- إنّ معرفة العلاقة بين قلق المستقبل ودرجة التوافق مع الحياة الجامعية ؛ لها أهمية كبرى في فهم سلوك الطالبات في إطار علمي، مما قد يسهم في تفسيره والتنبؤ به والتحكم فيه، مما يوفر قاعدة من المعلومات النفسية، التي يمكن أن تثرى المكتبة السعودية والعربية في هذا المجال.

❖ الأهمية التطبيقية:

- تنفيذ هذه الدراسة المرشحات، والمربيات في توفير البيئة المناسبة لمواجهة القلق والمساعدة على زيادة التوافق مع الحياة الجامعية، والتعرف على سمات الطالبات، ومخاوفهن والتغلب عليها، واستثمار إمكاناتهن على النحو الأفضل من خلال:
- ♦ إلقاء محاضرات وإقامة الأنشطة الهادفة لطالبات الجامعة من قبل المختصات في الإرشاد النفسي والتربوي، بهدف زرع روح الأمل والتفاؤل بالمستقبل .
- ♦ إقامة دورات وورش عمل لطالبات الجامعة، من قبل المرشحات والهيئة الإدارية والتدريسية، والتي تهدف إلى تبصير الطالبة بالمعلومات اللازمة عن المهن، ومتطلباتها والرغبة في العمل.
- الاستفادة مما تسفر عنه هذه الدراسة من نتائج في تصميم بعض البرامج الإرشادية من قبل المرشحات، والتي تهتم بتخفيف قلق المستقبل لدى طالبات الجامعة.
- الاستفادة مما تسفر عنه هذه الدراسة من نتائج في تصميم بعض البرامج الإرشادية من قبل المرشحات، والتي تهتم بتحسين درجة التوافق مع الحياة الجامعية لدى طالبات الجامعة.
- تأسيس مركز الإرشاد والتوجيه النفسي بالجامعة، من قبل المسؤولين في وزارة التعليم العالي، والذي يهدف إلى التعرف على المشكلات المستقبلية للطالبات، والتي تحول دون التوافق مع الحياة الجامعية ومساعدتهن على حلّها.
- إنشاء كراسٍ علمية في الجامعات من قبل وزارة التعليم العالي، والجهات الخيرية لدراسة وتقويم حاجات ومتطلبات توافق الطالبات مع الحياة الجامعية.

رابعاً : أهداف الدراسة

العلاقة بين "قلق المستقبل ودرجة التوافق مع الحياة الجامعية لدى عينة من طالبات جامعة الطائف بفرع تربة" ؛ تهدف إلى محاولة التعرف على:

- 1- نوع العلاقة بين درجات مقياس قلق المستقبل ودرجات مقياس التوافق مع الحياة الجامعية لدى عينة الدراسة .
- 2- الفروق في متوسطات درجات مقياس قلق المستقبل بأبعاده المختلفة، لدى طالبات الجامعة تبعاً لمتغيري التخصص الدراسي (العلمي - الأدبي) ، والفرقة الدراسية (الأولى - الرابعة).
- 3- الفروق في متوسطات درجات مقياس التوافق مع الحياة الجامعية بأبعاده المختلفة، لدى طالبات الجامعة تبعاً لمتغيري التخصص الدراسي (العلمي - الأدبي) ، والفرقة الدراسية (الأولى - الرابعة).

خامساً: مصطلحات الدراسة

❖ **قلق المستقبل** : مصطلح قلق المستقبل، من المصطلحات الحديثة نسبياً في مجال البحث العلمي . zaleski (1996)، ولقد تعددت تعريفات قلق المستقبل، حسب وجهات النظر التي يتبناها الباحثون، وفيما يلي عرض لبعض هذه التعريفات :

يعرّف معوض (1996) قلق المستقبل "بأنه القلق الناتج عن التفكير في المستقبل، والشخص الذي يعاني من قلق المستقبل، هو الشخص الذي يعاني التشاؤم من المستقبل، والاكتئاب، والأفكار الوسواسية، وقلق الموت، واليأس، كما أنه يتميز بحالة من السلبية، والانطواء والحزن، والشك والتثبيت، والنكوص وعدم الشعور بالأمن".

وتعرّف العجمي (2004) قلق المستقبل بأنه "قلق محدد يدرك الفرد أسبابه ودوافعه وتصاحبه صور من الخوف والشك والتوجس مما يحدث من تغيرات، سواء أكانت شخصية أم غير شخصية، ينتج من الشعور باليأس، وعدم الأمان، وعدم الثقة، من حيث التحكم بالنتائج والبيئة". (أبو الهدى، 2012)

وترى شقير (2005) بأن قلق المستقبل "خلل أو اضطراب نفسي المنشأ، ينجم عن خبرات ماضية غير سارة، مع تشويه وتحريف إدراكي معرفي للواقع وللذات، من خلال استحضار للذكريات، والخبرات الماضية غير السارة، مع تضخيم للسلبيات، بشكل يقلل من الإيجابيات الخاصة بالذات والواقع، تجعل صاحبها في حالة من التوتر وعدم الأمن، مما قد يدفعه لتدمير الذات، والعجز الواضح وتعميم الفشل وتوقع الكوارث، وتؤدي به إلى حالة من التشاؤم من المستقبل، وقلق التفكير في المستقبل، والخوف من المشكلات الاجتماعية والاقتصادية المستقبلية المتوقعة، والأفكار الوسواسية وقلق الموت واليأس".

التعريف الإجرائي لقلق المستقبل : تلتزم الباحثة بتعريف شقير.

ويقاس قلق المستقبل لدى طالبات الجامعة بالدرجة التي يحصلن عليها في مقياس قلق المستقبل

المستخدم في الدراسة الحالية وهو من إعداد (شقير، 2005).

❖ **التوافق مع الحياة الجامعية**: يمثل التوافق مع الحياة الجامعية أحد أبعاد التوافق العام لطلبة الجامعة. وتعرّف شوكت (2000) التوافق بأنه "سلوك، أو نشاط يقوم به الإنسان خاصة، والكائن الحي عامة، يهدف إلى تحقيق الفرد نجاحاً في حياته المختلفة".

ويقصد سوبر Super بالتوافق : " أنه التركيبة المكونة من الأنواع أو الجوانب الخاصة للتكيف، الذي يتخذ مظهرين هما: التوافق الذاتي والذي يتعلق بالتنظيم النفسي الذاتي للفرد، والتوافق الاجتماعي، ويعنى بالعلاقات بين الذات والآخرين، وهذان المظهران يعبران عن نفسيهما في مواقف الحياة المختلفة التي يوجد فيها الفرد، سواء في الأسرة، أو العمل، أو غيرهما". (الخالدي، 2002).

ويعرّف كل من بيكر وسيرك Baker& siryk (1999) التوافق مع الحياة الجامعية بأنه مفهوم متعدد الأبعاد، ينطوي على مجموعة من المتطلبات المتنوعة في النوع والدرجة، الأمر الذي يتطلب التأقلم معها، وهذه الأبعاد هي: التوافق الأكاديمي، والتوافق الاجتماعي، والتوافق العاطفي، والتوافق الشخصي، والتوافق المؤسسي" (al ,et ,Mahyuddin، 2009).

التعريف الإجرائي للتوافق مع الحياة الجامعية: يذكر عبدالسلام (2008) بأن "التوافق مع الحياة الجامعية مفهوم يشتمل على أربعة أبعاد رئيسية هي: التوافق الأكاديمي، و التوافق الاجتماعي، والتوافق العاطفي، والالتزام بتحقيق الأهداف، وتلتزم الباحثة بتعريف علي عبد السلام علي، ويقاس التوافق مع الحياة الجامعية لدى طالبات الجامعة، بالدرجة التي يحصلن عليها في مقياس التوافق مع الحياة الجامعية المستخدم في الدراسة الحالية، وهو من إعداد بيكر سيرك وترجمة عبدالسلام (2008).

طالبات جامعة الطائف: جميع الطالبات المسجلات والملتحقات بالدراسة في الفرقة الأولى والرابعة في جامعة الطائف بفرع تربة في الفصل الثاني للعام الدراسي 1435-1434هـ.

الفصل الثاني

الإطار النظري

يتضمن هذا الفصل، المفاهيم الأساسية للدراسة، والتي تضمنها عنوان الدراسة، "قلق المستقبل وعلاقته بدرجة التوافق مع الحياة الجامعية لدى عينة من طالبات جامعة الطائف بفرع تربية"، حيث تبين الباحثة مفهوم كل متغير على حدة، والمفاهيم المرتبطة به والنظريات المفسرة له.

أولاً : قلق المستقبل

يعدّ القلق عاملاً أساسياً من العوامل المؤثرة في شخصية الإنسان، ولا زال القلق من الموضوعات التي تحظى باهتمام الباحثين في العلوم النفسية لارتباطه بكل المشكلات النفسية .

ولا يمكن الحديث عن قلق المستقبل، إلا في ضوء فهم القلق بشكل عام، ولذا تحاول الباحثة أن تقوم بعرضه مهتمّة بكل مايتعلّق بموضوع الدراسة الحالية.

❖ مفهوم القلق :

القلق جزء طبيعي في كلّ آليات السلوك الإنساني، وعلامة على إنسانية الإنسان ويوجد عند جميع الناس في مواقف التّحدي ويصبح خطراً بازدياد درجته عن الحدّ الطبيعي .

يعرفه الداهري (2005) بأنّه "حالة نفسية تحدث حينما يشعر الفرد بوجود خطر يهدّده، ليحدّث له توتّر انفعالي تصاحبه اضطرابات فسيولوجية " .

ويذكر فراخ (2006) بأنّ القلق " شعور عامّ بالفزع والخوف من شرّ مرتقب وكارثة توشك أن تحدث، و استجابة لتهديد غير محدّد، كثيراً ما يصدر عن الصّراعات اللاشعورية، ومشاعر عدم الأمن والنزاعات الغريزية الممنوعة المنبئة من داخل النّفس " .

ويعرفه حسين (2007) بأنّه "حالة من التّوجس والهلع والخوف من حدوث تغيّرات غير مرغوب فيها لحياة الشّخص تجعله في حالة من الشّد النفسي والتّوتر والاضطراب، فالقلق هو أساس جميع الأمراض النفسية، والاختلالات الشخصية والاضطرابات السلوكية". وترى الباحثة أنّه بالرغم من اختلاف الباحثين في تعريف القلق وتنوّع التفسيرات، إلا أنّهم اتّفقوا على أنّ القلق هو نقطة بداية الاضطرابات والأمراض النفسية، وله تأثير واضح على صّحة إنتاجية الفرد .

❖ تصنيفات القلق : ذكر فايد (2003) أنّ القلق يصنّف إلى:

- **القلق الموضوعي العادي خارجي المنشأ:** يكون هذا القلق خارجياً، موجوداً فعلاً ويطلق عليه أحياناً اسم القلق الواقعي، وقد يطلق عليه القلق الدافع، أو القلق السويّ، وذلك لارتباط هذا النوع من القلق بموضوع حقيقيّ، ولذلك يكون القلق في هذه الحالة ردّ فعل مبرّر لموضوع خارجي، بحيث يهيئ الفرد نفسه للتعامل مع هذا الموضوع وتجنّب مخاطره .

- **القلق العصابي داخلي المنشأ :** وهو القلق الذي لا يدرك المصاب به مصدر علته، وكلّ ما هنالك أنّه يشعر بحالة من الخوف الغامض المنتشر غير المحدّد، وتعبّر أعراضه النفسيّة والفسيولوجية عن اضطراب داخلي يكون أشدّ بكثير ممّا يظهر في حالة القلق الموضوعي المألوف، الذي يمكن أن يوجد عند كلّ الناس.

وحسب التصنيف الدولي للأمراض صنّفت أشكال القلق إلى: اضطرابات الهلع، الخوف الاجتماعي، الخوف من الأماكن المكشوفة، القلق المعمّم .

❖ أعراض القلق :

- **الأعراض الجسمية :** وهي تشمل التغيّرات التي تحدث للجسم مثل برودة الأطراف، سرعة نبضات القلب ، ارتفاع ضغط الدم ، جفاف الحلق والشفتين، سرعة التّنفس.

- **الأعراض النفسية والاجتماعية :** مثل مشاعر الاكتئاب، التردّد في اتّخاذ القرارات، نقد الذات، العزلة والانطواء عن النّاس، سرعة اتّخاذ القرارات مهما كانت النتائج، صعوبة التّكيف مع الآخرين .(عثمان، 2004).

- **الأعراض المعرفية :** كما ذكرتها النوري (2012) عن إبراهيم (1994) وتتضمن الخصائص المعرفية الآتية :

♦ التّطرف في الأحكام : الشّخص المتوتر يفسّر المواقف باتجاه واحد، وهذا يجلب له القلق.

♦ يتبنى العصابيون اتجاهات ومعتقدات النفس، والحياة لا يقوم عليها دليل منطقي كالتسلطية، والجمود العقائدي، مما يحول بينهم وبين الحكم المستقل، واستخدام المنطق بدلاً من الانفعالات.

♦ ميل العصابين للاعتماد على الأقوياء ونماذج السلطة، مما يحولهم إلى أشخاص عاجزين عن

التّصرّف بحريّة انفعالية، عندما تتطلّب لغة الصّحة النفسية ذلك.

قلق المستقبل :

إنّ ظروف التغيّر التي تمرّ بها المجتمعات البشريّة قد تستثير قلق المستقبل لدى أفرادها ويظهر ذلك في مشاعر الخوف والتّوتر مما تخفيه الأيام القادمة، وهذا يدعوهم إلى إعادة النّظر بأهدافهم الحياتية ليتناسب مع ظروف التغيّر.

وقد ذكر المشيخي (2009) أنّ قلق المستقبل، يمثّل أحد أنواع القلق التي تشكّل خطورة في حياة الفرد، والتي تمثّل خوفاً من مجهول ينجم عن خبرات ماضية وحاضرة يعيشها الفرد وتجعله يشعر بعدم الأمن، ويتوقّع الخطر وعدم الاستقرار، وتودّي به إلى حالة من التّشاؤم واليأس، ويودّي به إلى اضطراب حقيقي وخطير مثل الاكتئاب، أو اضطراب عصبي خطير .

❖ **مفهوم قلق المستقبل :** قلق المستقبل خبرة انفعالية غير سارة، تحدث للفرد حالات من الخوف الغامض، والتنبؤ السلبي للأحداث التي سوف تقع، فيشعر بالتوتر والضيق والانقباض عند إسهاب التفكير فيها، مما يؤدي إلى ضعف في قدرة الفرد على تحقيق أهدافه وطموحاته، والشعور بأن الحياة غير جديرة بالاهتمام، والشعور أيضاً بالانزعاج، وعدم القدرة على التركيز والأمان نحو المستقبل . (عشري، 2004)

وتعرف سعود (2005) قلق المستقبل، " بأنه جزء من القلق العام المعم على المستقبل، يمتلك جذوره في الواقع الراهن ويتمثل في التشاؤم والعجز عن تحقيق الأهداف المهمة، وعدم السيطرة على الحاضر وعدم التأكد من المستقبل " .

ويشير عبد المحسن (2007) إلى أن قلق المستقبل هو " حالة من التوتر والتشاؤم يشعر بها الطالب الجامعي لندرة فرص العمل بعد التخرج " .

ويشير كرميان (2008) إلى أن قلق المستقبل هو " شعور انفعالي يتسم بالارتباك والضيق والغموض، وتوقع السوء والخوف من المستقبل، وضعف القدرة على التفاعل الاجتماعي " .

وفي ضوء ما تم استعراضه لمفهوم قلق المستقبل ترى الباحثة أن قلق المستقبل هو الشعور بعدم الارتياح والتفكير السلبي تجاه المستقبل وعدم الثقة بالنفس وفقدان الشعور بالأمن .

❖ **الطبيعة المعرفية لقلق المستقبل:** يفترض النموذج المعرفي للاضطرابات النفسية (نموذج بيك) الخاص بمرضى القلق، أن الأفكار التلقائية العابرة والتفسيرات وخيال مريض القلق، كل ذلك يتركز حول صور من الغضب وسوء التأويل لخبراته الشعورية في شكل الشعور بالخطر الجسدي والنفسي مع زيادة احتمال الأذى المتوقع في المستقبل، ومثل هذه الأفكار تؤدي إلى إثارة مشاعر الضيق والخوف . (محمد، 2010)

ويشير رواد الاتجاه المعرفي إلى أن التشويه المعرفي، وتشويه التفكير بالذات والعالم والمستقبل وراء نشأة واستمرار القلق، حيث يلجأ الشخص القلق إلى تضخيم السلبيات، والتقليل من شأن الإيجابيات، وتعميم الفشل وتوقع الكوارث ولوم الذات، وكل ذلك يرتبط بالتكوين المعرفي وكيفية إدراكه وتفسيره للأحداث، كما أن ذلك المحتوى المعرفي مسؤول عن انفعال الفرد وسلوكه والمستقبل . (العجمي، 2004)

وذكرت سعود (2005) أنه يمكن وصف قلق المستقبل من خلال المنحى المعرفي، على أنه إطار لمختلف العمليات المعرفية والمواقف الانفعالية، فالقلق هنا يترافق بتخمينات الخطر المتعلق بالمستقبل بناء على ما يتوافر في الواقع من معطيات، وعلى نوعية التصورات الشخصية، فبعض الأفراد هم أكثر قابلية لتخمين الحالات المستقبلية لكونها خطرة، لأنهم يملكون تصورات تتضمن معلومات عن المعنى الخطر للحالات وعن مقدرتهم المنخفضة في التعامل مع الخطر بشكل فاعل .

وترى الباحثة أن المكون الأساسي لقلق المستقبل، هو المكون المعرفي وأن قلق المستقبل يعود إلى تفكير خاطئ، وتشوهات معرفية، وسوء تفسير للأحداث، ويؤدي إلى زيادة الإحساس بالأعراض السلبية.

❖ النظريات العلمية المفسرة لقلق المستقبل :

بعد استعراض الباحثة للنظريات التقليدية أو الحديثة التي فسرت القلق، لم تجد نظرية فسرت قلق المستقبل بشكل خاص، وإنما كان تفسير القلق بالإشارة إليه بشكل موجز ومنها مايلي:

- **نظرية التحليل النفسي:** القلق من المنظور الفرويدي هو لبّ العصاب ومحوره، ويميز فرويد (1990) بين ثلاثة أنواع من القلق:

❖ **القلق الواقعي:** الذي ينتج من أخطار واقعية موجودة في العالم الخارجي للفرد .

❖ **القلق الأخلاقي :** وهو عبارة عن الخوف من الضمير، وينتج من الصراع مع الأنا الأعلى.

❖ **القلق العصابي :** وهو عبارة عن خوف من خروج رغبات الهو عن الانضباط، ولا يشمل الخوف من العقاب الذي ينتج عن ذلك . (القرشي، 2012)

ويفسر أدلر (Adler، 1996) القلق على " أنه وليد التفاعل الدينامي بين الفرد والمجتمع، ويرى أن الإنسان إذا حقق الانتصار للمجتمع الذي يعيش فيه، فإن هذا مدعاة لتقوية الروابط الاجتماعية التي تربط الفرد بالمحيطين به، وبالتالي إمكانية تغلبه على إحساسه بالنقص والعجز والقلق . (المصري، 2011) .

فعندما يشعر الفرد بالنقص، فإن هذا الشعور يدفعه للانطواء والبعد عن الآخرين، وهنا يصبح كائناً غير اجتماعي، ومن ثم يكون عرضةً للقلق حيث ينزع إلى محاولة التفوق للهروب من شعوره بالنقص، وهكذا يدخل في دائرة القلق . (شفيق، 2005)

- **النظرية المعرفية:** يفسر زaleski (1996) قلق المستقبل أنه حالة من عدم الراحة والانفعال، والخوف بشأن ما يمثله المستقبل الأكثر بعداً، وقدم بعد ذلك توضيحاً مهماً لما يتعلق بالجانب المعرفي الخاص بمفهوم القلق المستقبلي، على أن لقلق المستقبل مكونات معرفية قوية، أي أنه معرفي أكثر من كونه انفعالياً مؤكداً على الآليات الاستباقية المعرفية على أنها المصدر الأساسي لقلق المستقبل، حيث تشكل خصائص الأفكار واحدة من المقدمات المنطقية لقلق المستقبل، أي أن المعرفة أولاً ثم القلق، فيعتبر التمثيل المعرفي أساس قلق المستقبل، تترافق مع هذا التمثيل حالات عاطفية سلبية، ويؤكد ريتشارد لازاروس وزملاؤه (Lazarus، 1970) أهمية العوامل الموقفية في نشوء القلق، إذ ينظرون للتهديدات والضغط التي يواجهها الفرد، كمتغير يتدخل في عملية حدوث القلق والاستثارة .

وفي ضوء ما سبق فإن القلق من وجهة النظر المعرفية، ينشأ من خلل في التفكير الواقعي للموقف المثير للقلق لدى الفرد، بسبب أخطاء في عادات التفكير الواقعي في احتمال وشدة حدوث الخطر.

- **النظرية الإنسانية:** يرى أصحاب هذه النظرية أن القلق هو الخوف من المستقبل، وما يحمله من أحداث قد تهدد وجود الإنسان الكائن الوحيد الذي يدرك حتمية نهايته، وأنه معرض للموت في أي لحظة، ومن هنا فإن توقع فجائية حدوث الموت هو المثير الأساسي للقلق عند الإنسان، كما أن النظرية الإنسانية ترى أن القلق ينشأ من عدم التكافؤ بين الذات الواقعية، والذات المثالية، أي عندما يواجه الفرد بعض العوائق والصعوبات التي تقف أمام تحقيق أهدافه وطموحاته، أو عندما يواجه حدثاً يهدد بنيته الذاتية القائمة فعلاً، إذا فالمستقبل هو العامل الأساسي لإثارة حالة القلق عند الفرد من خلال التفكير بالمستقبل، فالشخصية في رأي روجرز تتألف من الكيان العضوي ومفهوم الذات، ولكل مكون من هذين المكونين حاجاته التي تتطلب الإشباع من أجل تحقيق الذات، فالتوتر الفسيولوجي الذي يصاب الشخص يكون ناتجاً عن ضغوط تلبيه الحاجات العضوية (الطعام، الشراب وغيرها) ؛ أما التوتر النفسي فهو ناتج عن ضغوط تلبيه الحاجات الخاصة ببناء الذات كالحاجة إلى (الشعور بالأمن النفسي، الحب)، والقلق في رأي روجرز، أعلى مستويات التوتر والذي يظهر من جراء التناقض الحاصل بين ضغوط الحاجات العضوية، وضغوط بناء الذات وإدراك الفرد .

أما ماسلو (Maslow)، (1972) فيشير إلى أن نمو الشخصية وتطورها يعتمد على الحاجات وتدرجها في الإشباع حسب أهميتها وضرورتها بالنسبة للفرد، وأن نوع البيئة التي يتعرض لها، تؤثر تأثيراً كبيراً على عملية نمو الشخصية، فالبيئة التي تكون مصدر تهديد للفرد، ولا تسمح له بإشباع حاجاته الأساسية، فإنها تعيق نموه، فيدرك العالم من حوله أنه عدائي أو خطير ومهدد، فيشعر بسوء التوافق. (حمزة، 2005).

تتبنى الباحثة أكثر النظريات تفسيراً للقلق حسب الدراسة الحالية، ويظهر ذلك في النظرية المعرفية، والنظرية الإنسانية، حيث أن القلق يرتبط بحاضر الفرد ومستقبله، والتغيرات التي تحدث في المستقبل تؤثر على أفكار الفرد، وتجعله يفكر تفكيراً لا عقلانياً، قد يسبب له بعض الاضطرابات الانفعالية ومن بينها القلق وسوء التوافق.

❖ **أسباب قلق المستقبل :** ذكر المشيخي (2009) أن قلق المستقبل يظهر من خلال رؤيتنا له بأنه مساحة غامضة، ومجال لوجهات نظر سلبية حول ما هو آت في الغد، والذي يمكن أن يظهر ويسود في فترة من الزمن، ويرتبط هذا القلق بحدث معين أو وضعيات شخصية، كتوقع أحداث أكثر فردية مثل المرض والمشكلات بين الأفراد، أو فقدان شخص قريب.

ويشير الغامدي (2012) إلى أن أسباب قلق المستقبل لدى الفرد تتمثل في :

- عدم القدرة على التكيف مع المشكلات التي تواجهه.
- الشعور بعدم الانتماء داخل الأسرة والمجتمع.
- نقص القدرة على التكهن بالمستقبل.
- الشعور بعدم الأمان والإحساس بالتمزق.
- عدم القدرة على الفصل بين أمنيته والتوقعات المبنية على الواقع.
- التفكك الأسري وعدم قدرة الوالدين والقائمين على رعايته على حل مشكلاته.

ويشير داينز (2006) إلى أن أسباب قلق المستقبل، هي التغيرات الاجتماعية في المجتمع، حيث أن رد الفعل الوجداني للتغيرات الأخلاقية والاجتماعية في المجتمع وضغوط الحياة العصرية، يولد مشاعر القلق والخوف من القصور، وتناقص الدور وضغوط الحياة، ومشكلات تكوين العلاقات مع الآخرين، وتشتمل هذه التغيرات المعتقدات الأخلاقية التي أعيد استخدامها في الماضي لتوجيه القرارات والتخوف المستمر من البطالة وإيقاع العصر الحديث والتغيرات السريعة في التطور التكنولوجي.

تذكر مسعود (2006) أن من أسباب قلق المستقبل نقص القدرة على التكهن بالمستقبل، وتدني مستوى القيم الأخلاقية، وتبني الأفكار اللاعقلانية.

ويشير إبراهيم (2006) إلى أن من أسباب قلق المستقبل النظرة السلبية للذات والأفكار اللاعقلانية اتجاه النفس والظروف السبئية المحيطة بالفرد والنظرة السلبية من قبل المحيطين به.

❖ **سمات ذوي قلق المستقبل:** يشير العنزي (2010) عن حسانين (2000) إلى مجموعة من السمات التي يتسم بها الأشخاص ذوي قلق المستقبل وأهمها:

- الهروب من الماضي والتركيز الشديد على أحداث الحاضر والانتظار السلبي لما قد يقع.
- الانسحاب من الأنشطة البناءة والطرق الروتينية في التعامل مع مواقف الحياة.
- المحافظة على الوضع الراهن باتخاذ إجراءات وقائية من أجل زيادة الفرص في المستقبل.
- التقليل من شأن الحالات السلبية باستخدام آليات دفاعية مثل الإزاحة والكبت.
- الانطواء والحزن الشديد والتردد، وظهور الانفعالات لأقل سبب.
- الخوف من التغيرات الاجتماعية المستقبلية.

ثانياً: التوافق مع الحياة الجامعية :

❖ **مفهوم التوافق :** تعددت مفاهيم التوافق لما له من أهمية في تحقيق طموحات الفرد وتحقيق، الشعور بالسعادة، ونعرض لمفهوم التوافق بصفة عامة والتوافق مع الحياة الجامعية بصفة خاصة، وأبعاده، فيمايلي:

ترى حجاب (2010) أن التوافق يعني " قدرة الإنسان على تغيير بيئته والقيام بدور إيجابي فيها وهو سلوك يهدف به الشخص إلى تحقيق نجاح في موقف معين، أو يقوم به لتحاشي الأضرار قدر الإمكان، ووصول الإنسان إلى مستوى أفضل من الصحة النفسية تغيب فيه الصراعات والتوترات وتتواجد معه علاقات إيجابية مع الآخر قدر المستطاع، وهو عملية مستمرة يعدل فيها الفرد ما يستطيع من سلوكه وبيئته الطبيعية والاجتماعية، مع تقبل ما لا يستطيع تعديله".

❖ **الخطوات الأساسية في عملية التوافق :**

- وجود دافع يدفع الإنسان إلى هدف خاص.
- وجود عائق يمنع من الوصول إلى الهدف ويحبط إشباع الدافع.
- قيام الإنسان بأعمال وحركات كثيرة للتغلب على العائق.
- الوصول إلى حل يمكن من التغلب على العائق ويؤدي إلى تحقيق الهدف وإشباع الدافع. (مجيد، 2012)

❖ **مجالات التوافق :** تتعدد مجالات التوافق فمنها التوافق العقلي والتوافق الدراسي، والتوافق المهني، والتوافق الجنسي، والتوافق الأسري، والتوافق السياسي أو الاقتصادي أو الديني، ويكون ذلك تبعاً لتعدد مواقف حياة الفرد، إلا أن معظم الباحثين في ميدان علم النفس يتفقون على أن بُعدي التوافق الأساسيين هما: البعد الشخصي (النفسي)، والبعد الاجتماعي، على اعتبار أن تلك المظاهر المتعددة يمكن ضمها إلى بعضها لتشكل عناصر البعدين الشخصي والاجتماعي. (عبدالسلام، 2008)

❖ **مستويات التوافق:** ذكر كل من أبي سكران (2009) ومجيد (2012) ثلاثة مستويات رئيسية للتوافق تتضمن:

- **التوافق على المستوى البيولوجي:** ويشير إلى أنّ التغير في الظروف ينبغي أن يقابله تغيير وتعديل السلوك بمعنى أنّه ينبغي على الكائن الحي أن يجد طرقاً جديدة لإشباع رغباته وإلا كان الموت حليفه، أي أنّ التوافق هنا إنّما هو عملية تتسم بالمرونة والتوافق المستمر مع الظروف المتغيرة .

- **التوافق على المستوى الاجتماعي:** وهو يعني علاقة حسنة بين الفرد والبيئة وهو تغيير للأفضل، فالفرد يولد ولديه أنواع شتى من الاستعدادات العصبية و الجسمية و النفسية، و كلها تحتاج إلى تهذيب وتقوم الأسرة بجزء ويقوم الاتصال والاحتكاك بالمجتمع بالجزء الآخر، أي أنّ البيئة تقدّم المادة الخام ، وتقدّم الثقافة القيم والمعايير.

- **التوافق على المستوى السيكولوجي:** هو إدراك لطبيعة علاقات الصراع التي يعيشها الفرد في علاقاته الاجتماعية والبيئية، وإنّ هذا الصراع يتولد معه توتر وقلق، وهو تجربة يغشاها الألم، لذلك فإنّ توافق الفرد إنّما يهدف إلى خفض التوتر وإزالة أسباب القلق، كذلك فالإنسان يرغب في إشباع دوافعه وإنّ هذا الإشباع يعتمد على البيئة، وهو لا يستطيع أن يُشبع جميع رغباته فهو يُشبع بعضها وعليه أن لا يطغى إشباع دوافع معينة على بقية الدوافع حتى يتحقق التوافق ؛ بل ويتحقق التكامل الذي يسمح للإنسان بتحقيق أقصى قدر من استغلال إمكانياته الرمزية والاجتماعية .

❖ **مفهوم التوافق مع الحياة الجامعية:** يذكر عبدالسلام (2008) عن عوض (1984) أنّ التوافق مع الحياة الجامعية "حالة تبدو في العملية الديناميكية المستمرة التي يقوم بها الطالب الجامعي لاستيعاب مواد الدراسة والنجاح فيها، وتحقيق التوافق بينه وبين البيئة الجامعية ومكوناتها الأساسية، وهي الأساتذة والمعلماء، والأنشطة الاجتماعية والثقافية، والرياضية والمواد الدراسية، وأسلوب التحصيل الدراسي" .

كذلك يعرف ماديان وزملاؤه، (al ,et ,Mahuddin 2010) التوافق مع الحياة الجامعية على أنّه "كل الجهود التي يقوم بها الطالب للتغلب على مختلف الضغوط والصعاب التي يواجهها في رحاب الجامعة" . ويعرف شيلدس (2002، Shields) التوافق مع الحياة الجامعية بأنّه " نجاح الطالب في إتمام أدواره الرسمية وغير الرسمية في الحياة الجامعية" .

❖ **النظريات العلمية المفسرة للتوافق:**

وعن تفسير التوافق ومكانته بين مختلف التوجهات النظرية، فيزخر التراث النفسي بمختلف التوجهات التي فسرت التوافق و من تلك التوجهات النظرية مايلي:

- **نظرية التحليل النفسي:** يعني التوافق عند (فرويد) بوجود الأنا القادرة على إيجاد الاتزان بين الأنا العليا والأنا، على الرغم من أنّه يرى أنّ بعض الحيل الدفاعية تؤدي إلى حدوث نوع من التوافق، ويرى أدلر (Adler) أنّ للتوافق مظهرين :التوافق السوي والتوافق غير السوي ويستدل عليهما من خلال متابعة الماثرة لدى الفرد، من أجل تحقيق التفوق وفق اتجاهين هما :اتجاه عصابي واتجاه معتدل . (أبو سكران، 2009)

- **النظرية السلوكية:** أما النظرية السلوكية يفسر روادها من أمثلة (واطسون) و(سكينر) عملية التوافق بأنها تتشكل بطريقة آلية عن طريق تلميحات أو إثباتات البيئة ، فالتوافق استجابات مكتسبة من خلال الخبرة التي تعرض لها الفرد والتي تؤهله للحصول على توقعات منطقية ؛ وعلى الإثابة فتكرار إثابة سلوك ما من شأنه أن يتحول إلى عادة، فالإنسان يتعلم السلوك السوي وغير السوي وتعزيز يقوي السلوك بنوعيه، والشخصية من وجهة نظر هذه المدرسة هي: مجموعة أساليب سلوكية متعلمة ثابتة نسبياً تميز الفرد عن غيره . (سفيان، 2004)

- **النظرية المعرفية:** يفسر أصحاب التوجه المعرفي التوافق في ضوء عدة نماذج نذكر منها النموذج الأكثر بروزاً في تفسير التوافق وهو نموذج إدراك وتقييم الفرد للمواقف الحياتية، فيرى كل من (Lazarus and Folkma) أنّ تقييم الفرد الأولي للموقف يحدّد أساليبه في التوافق حيث يتمّ تقييم الفرد للأحداث المسببة للضغط النفسي على أنّها مرهقة أو تفوق قدرته، وتعرضه للخطر في إطار علاقته بالبيئة وتقييمه المعرفي للضغط، وتنتج نتيجة ذلك استجابات مختلفة انفعالية وفسولوجية اتجاه الحدث الضاغط فقد يدرك شخصان الحدث على أنّه ضاغط لكن أحدهما يعتقد أنّ لديه مصادر وإمكانياته التي تساعده على التعامل معه، بينما لا يعتقد الشخص الآخر ذلك طبقاً لمصادر المواجهة الشخصية والمعرفية والاجتماعية والمادية لدى كلّ منهما . (حسين وسلامة، 2006)

وترى الباحثة أنّ نظرية التحليل النفسي تنظر إلى مفهوم التوافق على أنّه يحدث عندما تكون الأنا مسيطرة على الهو والأنا الأعلى، وإشباع الرغبات البيولوجية بالصورة التي تسمح بتجنب العقوبات الاجتماعية، وترى النظرية السلوكية أنّ مفهوم التوافق هو: اكتساب الفرد لمجموعة من العادات المناسبة والفعالة لمعاملة الآخر التي سبق أن تعلمها الفرد وأدّت إلى خفض التوتر إذا أشبعت دوافعه وحاجاته، ويؤكد أصحاب الاتجاه المعرفي على نموذج إدراك المواقف الحياتية حيث يرى أصحاب هذه النظرية أنّ تقييم الفرد الأولي للموقف يحدّد أساليبه في التوافق، وقد تكون سلبية أو ايجابية في إطار علاقته بالبيئة وتقييمه المعرفي للموقف .

❖ **أبعاد التوافق مع الحياة الجامعية :** يذكر عبد السلام (2008) أنّ هناك أبعاداً للتوافق مع الحياة الجامعية يمكن إجمالها فيما يلي:

- **التوافق الأكاديمي:** وهو قدرة الطالب على الوصول إلى حالة الرضا النفسي عن أدائه الأكاديمي، وإحساسه بحالة من التناغم في علاقاته مع أساتذته ومع البيئة الجامعية.

- **التوافق الاجتماعي :** حالة التوافق بين الفرد والبيئة المحيطة به وهي عملية ديناميكية مستمرة تهدف إلى تعديل سلوك الفرد في سبيل التغلب على الصعوبات التي تقف حائلاً بينه وبين إقامة علاقة ودية حميمة مع نفسه من جهة وبينه وبين البيئة المحيطة به من جهة أخرى .

- **التوافق العاطفي :** هو أي نشاط يقوم به الطالب الجامعي ويحقق له قدراً من الرضا عن الذات والثقة بالنفس، والقدرة والمهارة على إشباع حاجاته ودوافعه دون إحباط من البيئة المحيطة، فهو الإحساس بتقبل القيم والاتجاهات الجامعية والمشاركة في الأنشطة الجامعية المختلفة، ويهدف أيضاً إلى الكشف عن تحقيق أكبر قدر ممكن من التوافق في العلاقات العاطفية الإيجابية مع الجنس الآخر، والتفاعل الإيجابي معها.

- **الالتزام بتحقيق الأهداف :** قدرة الطالب على إشباع حاجاته ومتطلباته النفسية والاجتماعية والدراسية، وتحقيق النجاح في الأهداف التي وضعها أثناء دخول البيئة الجامعية من خلال المكونات الأساسية لها، من حيث الزملاء والأساتذة والأنشطة الاجتماعية والترفيهية.

الفصل الثالث

السَّابِقَةُ الدَّرَاسَات

قامت الباحثة بالاطلاع على العديد من الدراسات السابقة التي لها علاقة بموضوع الدراسة و متغيراتها، من أجل الاستفادة من الموضوعات التي أثارها الباحثون لتشكيل بعض المنطلقات التي يمكن البناء عليها، و من هذه الدراسات التي سيتم عرضها:

أولاً: الدراسات التي تناولت قلق المستقبل :

❖ دراسة القرشي (2012) بعنوان "العلاقة بين الدافع للإنجاز وقلق المستقبل لدى عينة من طلاب جامعة أم القرى"، ومن أهداف الدراسة التحقق من وجود فروق في قلق المستقبل لدى طلاب الجامعة طبقاً للمستوى الدراسي والتخصص، وتكونت عينة الدراسة من (300) طالب، واستخدم مقياس قلق المستقبل إعداد شقير(2005)، وتوصلت الدراسة إلى عدم وجود فروق دالة بين متوسطات قلق المستقبل ترجع لمتغير المستوى الدراسي (الأول – الرابع) ومتغير التخصص (علمي – أدبي).

❖ وفي دراسة النوري (2012) بعنوان " الإرهاب النفسي لدى طلبة الجامعة وعلاقته بقلق المستقبل " هدفت معرفة الفروق في قلق المستقبل لدى طلبة الجامعة في ضوء متغير التخصص الدراسي، واختيرت عينة قوامها (200) طالب، وقد استخدمت مقياس قلق المستقبل من إعداد المشيخي، واتبعت الاختبار التائي لعينة مستقلة، وأظهرت النتائج وجود فروق دالة في قلق المستقبل بالنسبة لمتغير التخصص ولصالح التخصص العلمي .

❖ وقدم رمضان(2010) دراسة بعنوان " قلق المستقبل وعلاقته ببعض المتغيرات لدى طلبة كليات التربية بجامعة الأنبار"، وهدفت الدراسة إلى تحديد فروق على مقياس قلق المستقبل تبعاً لمتغير التخصص، وتكونت عينة الدراسة من (195) طالباً، والاختبار التائي لعينة واحدة، وأشارت النتائج إلى وجود فروق في قلق المستقبل لدى طلبة المرحلة الرابعة وفقاً لمتغير التخصص ولصالح التخصص الإنساني.

❖ كما أجرت السبعوي (2010) دراسة بعنوان " قلق المستقبل لدى طلبة كلية التربية وعلاقته بالجنس والتخصص الدراسي"، وهدفت إلى التعرف على العلاقة بين متغير قلق المستقبل لدى طلاب كلية التربية، والتخصص الدراسي (علمي / أدبي)، وتكونت العينة من (578) طالباً وطالبة، واستخدمت معامل ارتباط بيرسون، وتوصلت إلى وجود علاقة ارتباطية دالة بين متغير قلق المستقبل ومتغير التخصص الدراسي، لصالح التخصص العلمي .

❖ وقام الثنيان (2009) بدراسة بعنوان " جودة الحياة وعلاقتها بقلق المستقبل لدى طلاب الجامعة" و هدفت إلى التعرف على الفروق في قلق المستقبل وفقاً للتخصص (علمي – إنساني)، وتكونت عينة الدراسة من (500) طالب وطالبة، طبق عليهم مقياس قلق المستقبل من إعداد الباحث، وكشفت النتائج عن وجود فروق دالة إحصائياً بين أفراد قلق المستقبل وفقاً للتخصص لصالح التخصص الإنساني .

❖ وهدفت دراسة المشيخي (٢٠٠٩) التي كانت بعنوان "قلق المستقبل وعلاقته بفاعلية الذات ومستوى الطموح لدى عينة من طلاب جامعة الطائف" إلى التعرف على الفروق بين طلاب التخصص العلمي والأدبي في درجات قلق المستقبل، والفروق بين طلاب السنة الأولى والسنة الرابعة في درجات قلق المستقبل، واتبعت المنهج الوصفي، وتكونت عينة الدراسة من (720) طالباً من طلاب جامعة الطائف وطبق عليهم مقياس قلق المستقبل من إعداد الباحث، وتوصلت إلى وجود فروق ذات دلالة إحصائية بين متوسطات درجات طلاب كلية العلوم وطلاب كلية الآداب على مقياس قلق المستقبل، وذلك لصالح طلاب كلية الآداب ووجود فروق ذات دلالة إحصائية، بين متوسطات درجات طلاب السنة الأولى وطلاب السنة الرابعة على مقياس قلق المستقبل، لصالح طلاب السنة الرابعة .

❖ وسعت دراسة مندوه (٢٠٠٦) بعنوان " العلاقة بين قلق المستقبل وبعض مظاهر التوافق الدراسي لدى طلاب الجامعة " إلى التعرف على الفروق بين طلاب الجامعة وفقاً لمتغير التخصص والفرقة الدراسية والتفاعل بينها في قلق المستقبل، وعلاقة قلق المستقبل بالتوافق الدراسي، وتكونت عينة الدراسة من (600) طالب، وطبق عليهم مقياس قلق المستقبل، ومقياس التوافق الدراسي من إعداد الباحث، وتوصلت الدراسة إلى وجود فروق ذات دلالة إحصائية بين طلاب التخصصات العلمية والأدبية في قلق المستقبل لصالح التخصصات الأدبية، و وجود فروق ذات دلالة إحصائية بين الفرق الدراسية من الفرقة الأولى إلى الفرقة الرابعة في قلق المستقبل لصالح طلاب الفرقة الرابعة، كما كشفت نتائج الدراسة عن وجود ارتباط سالب دال إحصائياً بين درجات الطلاب على مقياس قلق المستقبل بأبعاده المختلفة ودرجاتهم على مقياس التوافق الدراسي بأبعاده المختلفة.

❖ وقام كل من فرج و محمود (٢٠٠٦) بدراسة بعنوان " قلق المستقبل وعلاقته ببعض المتغيرات لدى طلبة كلية التربية بالإسكندرية " تهدف إلى التعرف على الفروق في قلق المستقبل، تبعاً للتخصص الدراسي (علمي وأدبي)، وكانت عينة الدراسة (242) طالباً وطالبة وتم تطبيق أدوات الدراسة وهي مقياس قلق المستقبل إعداد شقير، وتوصلت إلى عدم وجود فروق دالة إحصائية، بين التخصص العلمي والأدبي في قلق المستقبل.

ثانياً: الدراسات التي تناولت التوافق مع الحياة الجامعية :

❖ دراسة السويلم (2013) بعنوان " العلاقة بين الذكاءات المتعددة، والتوافق مع الحياة الجامعية لدى عينة من طالبات جامعة الحدود الشمالية"، ومن أهداف الدراسة التعرف على الفروق في مقياس درجة التوافق مع الحياة الجامعية ؛ وأبعاده، والفروق في متوسط درجات الطالبات في مقياس التوافق مع الحياة الجامعية في ضوء متغير التخصص الدراسي (العلمي – الأدبي)، على عينة مكونة من (90) طالبة، واستخدمت مقياس التوافق مع الحياة الجامعية من تعريب عبدالسلام (2008)، وكان من نتائجها أنه لا توجد فروق ذات دلالة إحصائية في درجة التوافق مع الحياة الجامعية وأبعاده، كما لا توجد فروق في متوسطات درجات التوافق مع الحياة الجامعية ومتغير التخصص الدراسي (العلمي – الأدبي).

❖ وفي دراسة فايد وعبد الجابر(2012) التي ذكر فيها أن كلاً من القومي وسلامة (2011) أجريا دراسة بعنوان " التوافق الجامعي لدى طلبة السنة النهائية بالجامعة في الأكاديمية الفلسطينية للعلوم الأمنية في أريحا " وهدفت إلى تحديد الفروق في التوافق الجامعي، تبعاً لمتغير التخصص الدراسي، واستخدم عينة بلغت (121) طالباً وطالبة، وطبق عليهم مقياس الليل للتوافق الجامعي، وتوصلت إلى عدم وجود فروق دالة إحصائية ترجع لمتغير التخصص الدراسي.

❖ وفي دراسة أجراها مورييس وآخرون al , el , Morris (2011) بعنوان " دور استخدام شبكة التواصل الاجتماعي الفيسبوك، بتكوين اتجاهات إيجابية نحو تقدير الذات، والتوافق مع الحياة الجامعية "هدفت إلى تحديد الفروق في التوافق مع الحياة الجامعية بين طلاب الفرقة الأولى والرابعة بالجامعة، وتكونت عينة الدراسة من

(70) طالباً جامعياً من الجنسين، وطُبِّقَ عليهم عدّة مقاييس منها مقياس التوافق الجامعي، وتوصلت الدراسة إلى عدم وجود فروق دالة بين المجموعتين في التوافق مع الحياة الجامعية.

❖ دراسة دانيال Danial (2010) بعنوان "التوافق الاجتماعي والأكاديمي لدى طلاب السنة الأولى" وهدفت إلى التعرف على الفروق في التوافق الاجتماعي والأكاديمي، في ضوء متغير المستوى الدراسي لطلاب الجامعة، وتكونت عينة الدراسة من (545) طالباً، وطُبِّقَ على العينة استبيانات خاصة بالتوافق الاجتماعي والأكاديمي، وتوصلت إلى وجود فروق دالة بين التوافق الاجتماعي والأكاديمي لصالح طلاب السنة الأولى.

❖ كما أجرت حجاب (2010) دراسة بعنوان "الفروق في التوافق مع الحياة الجامعية باختلاف طبيعة الشعب الدراسية بكلية التربية النوعية"، وهدفت إلى التعرف على الفروق بين متوسطات درجات طلاب الفرقة الرابعة في التوافق مع الحياة الجامعية؛ وتكونت عينة الدراسة من (100) طالب وطالبة من الفرقة الرابعة طبق عليهم مقياس التوافق مع الحياة الجامعية، تعريب عبد السلام (2008)، و توصلت إلى وجود فروق دالة إحصائياً بين متوسطات درجات طلاب الفرقة الرابعة في التوافق مع الحياة الجامعية بأبعاده المختلفة.

❖ وتناولت دراسة كل من حباب ومرق (2009) "واقع التوافق الجامعي لدى طلبة جامعة النجاح الوطنية في ضوء بعض المتغيرات"، كما هدفت إلى معرفة الفروق في واقع التوافق، تبعاً لمتغير التخصص (العلمي والادبي)، ولتحقيق أهداف الدراسة، استخدم الباحثان مقياس التوافق الجامعي أعدّه جمل الليل وتكونت عينة الدراسة من (854) طالباً وطالبة وأسفرت الدراسة عن عدم وجود فروق دالة في واقع التوافق، في كل من المجال الاجتماعي والأكاديمي والانضباطي تبعاً لمتغير التخصص الدراسي، ووجود فروق في المجال الانفعالي بين أفراد العينة، لصالح طلاب التخصص الأدبي .

❖ كذلك هدفت دراسة راموس ونيكولاس Romos & Nichlas (2007) التي كانت بعنوان العلاقة بين فاعلية الذات والتوافق مع الحياة الجامعية إلى معرفة الفروق في التوافق مع الحياة الجامعية؛ تبعاً للسنة الدراسية الأولى والرابعة، وأجريت الدراسة على عينة قوامها (192) طالباً طبق عليهم مقياس التوافق مع الحياة الجامعية، ودلت النتائج على أنّ طلاب السنة الأولى، لديهم توافق أعلى مع الحياة الجامعية .

ثالثاً: التعليق العام على الدراسات السابقة :

- تباينت أهداف الدراسات السابقة، فمنها ما هدف إلى التعرف على قلق المستقبل وعلاقته بالإرهاب النفسي، مثل دراسة النوري (2012) وقلق المستقبل وعلاقته بالدافع للإنجاز، مثل دراسة القرشي (2012).

- معظم الدراسات السابقة المتعلقة بقلق المستقبل تناولت في منهجيتها المنهج الوصفي في مجتمع الدراسة، و الدراسة الحالية ستستخدم المنهج الوصفي .

- يتضح أنّ معظم الدراسات قد طبقت على طلبة الجامعة، وهذا ما قامت به الباحثة في الدراسة الحالية، وأجريت على عينات مختلفة من حيث الحجم والمواصفات، كما استعانت بأدوات في قياس المتغير الأساسي "قلق المستقبل" .

- تباينت نتائج الدراسات بمسألة الفروق بين المستوى الدراسي في قلق المستقبل، حيث أشارت نتائج بعض الدراسات إلى عدم وجود فروق بين المستوى الدراسي في قلق المستقبل، منها دراسة القرشي (2012)، أما دراسة مندوة (2006) ودراسة المشيخي (2009) فقد أشارت إلى وجود فروق بين درجات المستوى الدراسي لصالح الفرقة الرابعة في قلق المستقبل .

- تباينت نتائج الدراسات بمسألة الفروق بين التخصص الدراسي (علمي-أدبي) في قلق المستقبل؛ حيث أشارت نتائج بعض الدراسات إلى عدم وجود فروق بين التخصص الدراسي في قلق المستقبل، منها دراسة القرشي (2012) و دراسة فرج ومحمود (2006)، أما دراسة النوري (2012)، والسبعوي (2010) فقد أشارت إلى وجود فروق بين درجات التخصص الدراسي لصالح التخصص العلمي في قلق المستقبل، وأشارت دراسة مندوة (2006)، والثنيان (2009)، ورمضان (2010)، والمشخي (2009) إلى وجود فروق في درجات قلق المستقبل لصالح التخصص الأدبي .

- تباينت نتائج الدراسات بمسألة الفروق بين المستوى الدراسي في التوافق مع الحياة الجامعية حيث أشارت نتائج بعض الدراسات إلى عدم وجود فروق بين المستوى الدراسي في درجة التوافق مع الحياة الجامعية مثل دراسة موريس (2011)، أما دراسة نيكولاس وراموس (2007) و دراسة دانيال (2010) أشارت إلى وجود فروق في التوافق الاجتماعي والأكاديمي لصالح الفرقة الأولى، وأما دراسة حجاب (2010) فقد أشارت إلى وجود فروق بين المستوى الدراسي لصالح الفرقة الرابعة في التوافق مع الحياة الجامعية .

- أشارت نتائج بعض الدراسات، إلى عدم وجود فروق بين التخصص الدراسي في درجة التوافق مع الحياة الجامعية، منها دراسة السويلم (2013)، و القدومي وسلامة (2011) في حين أشارت دراسات أخرى كدراسة حباب ومرق (2009)، إلى وجود فروق في بعد التوافق الانفعالي لصالح التخصص الأدبي.

- تتفق معظم الدراسات السابقة في المعالجات الإحصائية، حيث استخدمت المتوسطات الحسابية، واختبار (ت)، واختبار تحليل التباين الأحادي والثنائي، ومعامل ارتباط بيرسون، وستعتمد الباحثة في الدراسة الحالية، معامل بيرسون - اختبار .

- هناك دراسات تناولت العلاقة بين قلق المستقبل والتوافق الدراسي، الذي يعدّ أحد أبعاد التوافق مع الحياة الجامعية، والتي تمثل المتغير الثاني في الدراسة الحالية، مثل دراسة مندوة (2006).

- أثبتت دراسات قلق المستقبل، أنّ القلق من المستقبل ينتشر بين مرحلة الشباب بشكل أكثر من غيره من المراحل العمرية، وذلك من خلال العينات التي تمّ اختيارها في الدراسات السابقة.

- أثبتت دراسات قلق المستقبل أنّ العلاقة بين قلق المستقبل وبعض المتغيرات علاقة إيجابية مثل دراسة رمضان (2010).

- تنوعت المقاييس التي استخدمتها الدراسات السابقة و في الدراسة الحالية استخدمت الباحثة مقياس التوافق الجامعي من تعريب عبد السلام (2008) و مقياس شقير (2005).

وتتميز الدراسة الحالية عن الدراسات السابقة فيما يلي:

- ❖ لم تتناول الدراسات السابقة قلق المستقبل وعلاقته بدرجة التوافق مع الحياة الجامعية على عينة الطالبات الجامعيات ؛ مما دعا الباحثة إلى إجراء هذه الدراسة، وبهذا تعدّ الدراسة الأولى على حدّ علم الباحثة في البيئة المحلية.
- ❖ لقد استفادت الباحثة من الدراسات السابقة التي حصلت عليها في صياغة أسئلة الدراسة وتحديد أهدافها، وصياغة الفروض، واختيار المنهج المناسب، ودراسة واختيار الأساليب الإحصائية المناسبة لها، كما استفادت الباحثة من المعلومات والمفاهيم النظرية التي تناولتها هذه الدراسات في إثراء الإطار النظري الخاص بالدراسة الحالية .

رابعاً: فروض الدراسة :

في ضوء الإطار النظري والدراسات السابقة، قامت الباحثة بصياغة فروض الدراسة على النحو التالي:

الفرض الأول : توجد علاقة ارتباطية ذات دلالة إحصائية بين درجات مقياس قلق المستقبل ودرجات مقياس التوافق مع الحياة الجامعية، لدى عينة من طالبات جامعة الطائف بفرع تربة .

الفرض الثاني : توجد فروق ذات دلالة إحصائية بين متوسطات درجات مقياس قلق المستقبل بأبعاده المختلفة، لدى عينة الدراسة تبعاً لمتغير التخصص الدراسي (العلمي – الأدبي) .

الفرض الثالث: توجد فروق ذات دلالة إحصائية بين متوسطات درجات مقياس قلق المستقبل بأبعاده المختلفة لدى عينة الدراسة تبعاً لمتغير الفرقة الدراسية (الأولى – الرابعة) .

الفرض الرابع : توجد فروق ذات دلالة إحصائية، بين متوسطات درجات مقياس التوافق مع الحياة الجامعية بأبعاده المختلفة، لدى عينة الدراسة تبعاً لمتغير التخصص الدراسي (العلمي – الأدبي) .

الفرض الخامس: توجد فروق ذات دلالة إحصائية بين متوسطات درجات مقياس التوافق مع الحياة الجامعية بأبعاده المختلفة، لدى عينة الدراسة تبعاً لمتغير الفرقة الدراسية (الأولى –الرابعة).

الفصل الرابع

منهج وإجراءات الدراسة

يتناول هذا الفصل وصفاً تفصيلياً للإجراءات التي اتبعتها الباحثة في تنفيذ الدراسة، ومنها تعريف منهج الدراسة، ووصف مجتمع الدراسة، وتحديد عينة الدراسة، وأدوات الدراسة المستخدمة لجمع البيانات، والتأكد من صدقها وثباتها، وبيان إجراءات الدراسة، والأساليب الإحصائية التي استخدمت في معالجة النتائج، وفيما يلي وصف لهذه الإجراءات.

أولاً: منهج الدراسة

اتبعت الباحثة في هذه الدراسة المنهج الوصفي الارتباطي والسببي المقارن، لمناسبته لأهداف الدراسة، حيث أنّ المنهج الوصفي الارتباطي يقوم بوصف الظاهرة كما هي في الواقع، بوصفها وصفاً دقيقاً من خلال التعبير النوعي ودراسة العلاقات التي توجد بين هذه الظاهرة المراد دراستها، والظواهر الأخرى والتعبير عنها كمياً وكيفاً. (القرشي، 2012).

ثانياً: عينة الدراسة

تتكون عينة الدراسة الحالية، من طالبات كلية التربية والآداب، وكلية العلوم الطبية والتطبيقية بجامعة الطائف بفرع تربية مرحلة البكالوريوس، اللاتي يدرسن في الفرقة الأولى، ويقصد بهن طالبات السنة التحضيرية والفرقة الرابعة ويقصد بهن من سيتخرجن وعددهن (200) طالبة وتم اختيارهن بالطريقة العشوائية التطبيقية المتساوية بواقع (100) طالبة من كلية العلوم من أقسامها المختلفة و(100) طالبة من كلية التربية والآداب من أقسامها المختلفة.

جدول (1)

توزيع عينة الدراسة بشكل إجمالي

الفرقة الدراسية	التخصص	العدد
الأولى	علمي	50
الرابعة	أدبي	50
الأولى	علمي	50
الرابعة	أدبي	50

جدول (2)

أعداد طالبات الفرقة الأولى عينة الدراسة

الفرقة الدراسية	التخصص	العدد
الأولى	العلمي	50
الأولى	الأدبي	50

يوضح الجدول (2) الأعداد التفصيلية للطالبات اللاتي قمن بالإجابة عن مقياس قلق المستقبل ومقياس درجة التوافق مع الحياة الجامعية من طالبات الفرقة الأولى للقسم العلمي والأدبي.

جدول (3)

أعداد طالبات الفرقة الرابعة عينة الدراسة

الفرقة الدراسية	التخصص	الكلية	القسم	العدد	المجموع
الرابعة	العلمي	كلية العلوم الطبية التطبيقية	الرياضيات	25	50
			الكيمياء	17	
			المختبرات	8	
الرابعة	الأدبي	كلية التربية والآداب	اللغة الانجليزية	25	50
			اللغة العربية	2	
			دراسات إسلامية	19	
			رياض أطفال	4	

يوضح الجدول (3) الأعداد التفصيلية للطالبات اللاتي قمن بالإجابة عن بنود مقياس قلق المستقبل ومقياس درجة التوافق مع الحياة الجامعية من طالبات الفرقة الرابعة للأقسام العلمية والأدبية.

ثالثاً: أدوات الدراسة

تعرض الباحثة في هذا المقام وصفاً للأدوات المستخدمة في الدراسة، وذلك وفقاً لترتيبها حسب عنوان الدراسة، وهذه الأدوات هي:

❖ **مقياس قلق المستقبل:** إعداده (شقيير، ٢٠٠٥)، يهدف المقياس إلى معرفة رأي الفرد الشخصي بوضوح في المستقبل وذلك عن مقياس متدرج خماسي من (مرتفع جداً، مرتفع، متوسط، بسيط، منخفض)؛ وموضوع أمام هذه التقديرات خمس درجات هي (5-4-3-2-1) على الترتيب وذلك عندما يكون اتجاه البنود نحو قلق المستقبل سلبي، بينما تكون هذه التقديرات في اتجاه عكسي (1-2-3-4-5) عندما يكون اتجاه البنود نحو قلق المستقبل إيجابياً، وبذلك تشير الدرجة المرتفعة على المقياس إلى ارتفاع قلق المستقبل لدى الفرد، ويتكون المقياس من (٢٨) مفردة موزعة على خمسة أبعاد كالآتي:

- 1 - القلق المتعلق بالمشكلات الحياتية ويشمل أرقام المفردات (17-20-21-22-24).
- 2 - قلق الصحة وقلق الموت ويشمل أرقام المفردات (10-18-19-25-26).
- 3 - القلق الذهني (قلق التفكير في المستقبل) ويشمل (3-6-11-13-14-23-28).
- 4 - اليأس من المستقبل ويشمل أرقام المفردات (4-7-8-9-12-16).
- 5 - الخوف والقلق من الفشل في المستقبل ويشمل أرقام المفردات (1-2-5-15-27)، وبذلك تتراوح الدرجة الكلية للمقياس ما بين (1-112 درجة) ويتم تحديد المستويات طبقاً للآتي:

جدول (4)

مستويات قلق المستقبل

أرقام البنود	اتجاه التصحيح	مستويات قلق المستقبل
من 10-1	1-2-3-4-5	قلق مستقبل مرتفع جداً
		من 91-112 درجة
		قلق مستقبل مرتفع
		من 68-90 درجة
من 11-28	5-4-3-2-1	قلق مستقبل معتدل
		من 45-67 درجة
		قلق مستقبل بسيط
		من 22-44 درجة
		قلق مستقبل منخفض
		من 1-21 درجة
		الدرجة الكلية لقلق المستقبل
		112 درجة

وقامت معدة المقياس بتطبيقه على عينة من الجنسين، من فئات مختلفة وأعمار زمنية مختلفة، وتكونت عينة الذكور من (٣٦٠) وعينة الإناث من (٣٦٠) بحيث بلغت العينة الكلية للتقنين (٧٢٠).

- صدق وثبات المقياس لـ (شقيير، 2005):

• صدق المقياس:

وقد استخدمت معدة المقياس (زينب شقيير) الطرق الإحصائية التالية لحساب صدق المقياس:

♦ **الصدق الظاهري:** حيث تم عرض المقياس على مجموعة من المتخصصين في مجال الصحة النفسية والإرشاد النفسي.

♦ **صدق المحك:** حيث تم تطبيق المقياس على عينة قوامها (١٢٠) طالباً وطالبة (مناصفة بالفرقة الرابعة) بكلية التربية بطنطا وكان معامل الارتباط بين درجات المقياسين (0، 87-83، 0).

_ (0، 84) وهو ارتباط دال ومرتفع، مما يضمن صلاحية المقياس للاستخدام.

- **صدق المفردات :** تم حساب ارتباط كل بند بالدرجة الكلية للمقياس على عينة طلاب وطالبات الكلية (٢٠٠) وكانت معاملات الارتباط دالة.
- **طريقة الاتساق الداخلي (صدق التكوين) :** تم إيجاد معاملات الارتباط بين محاور المقياس الخمسة وبين بعضها بعضاً، وكذلك بين كل محور وبين الدرجة الكلية للمقياس، تراوحت معاملات الارتباط ما بين (0، 67 – 0، 93) وهذا يزيد من الاطمئنان على ارتفاع صدق المقياس لما وضع له.
- **صدق التمييز :** تبين أن قيمة " ف " جميعها دالة عند مستوى (0، 01) أي أن هناك فروقاً ذات دلالة إحصائية بين المجموعات الثنائية، مما يطمئن على صدقه وإمكانية استخدامه في القياس.

• ثبات المقياس:

قامت معدة المقياس (شقير) بحساب الثبات بعدة طرق:

- **طريقة إعادة تطبيق الاختبار :** تم تطبيقه على عينة من طلاب كلية التربية جامعة طنطا وعددها (٨٠) طالباً بالتساوي على مرتين بفصل زمني بينهما شهرًا، وبلغ معامل الارتباط بين التطبيقين (0، 84 – 0، 83 – 0، 81).

• طريقة التجزئة النصفية :

تم حسابه بطريقتين :

– باستخدام معادلة سبيرمان براون "Sperman – Brown" حيث معامل الارتباط بين البنود الزوجية والفردية (0، 82) وبلغ معامل الثبات (0، 82) وهو مرتفع ودال عند مستوى (0، 01) مما يطمئن على استخدام المقياس .

– تم تقسيم المقياس إلى مجموعتين من البنود، من 1-14، 15-28 وتم إيجاد معامل الارتباط بين درجات بنود المجموعتين، وبلغ (0، 81) وهو معامل ارتباط مرتفع ودال عند مستوى (0، 01).

- **طريقة كرونباخ (معامل ألفا) :** حيث تم حساب معامل ألفا على عينة من الذكور والإناث من طلاب الجامعة، مقدارها (١٠٠ مائة) طالب من الجنسين وبلغ معامل الثبات (0، 88 – 0، 91 – 0، 92) وهي معاملات ثبات مرتفعة للمقياس.

- التحقق من الشروط السيكومترية في الدراسة الحالية:

• صدق المقياس:

- **طريقة الاتساق الداخلي (صدق التكوين) :** الصدق البنائي يعتبر أحد مقاييس صدق الأداة الذي يقيس مدى تحقق الأهداف التي تريد الأداة الوصول إليها، ويبين مدى ارتباط كل مجال من مجالات الدراسة، بالدرجة الكلية لفقرات المقياس.

جدول (5)

معاملات ارتباط أبعاد مقياس قلق المستقبل ببعضها وبالدرجة الكلية

الدرجة الكلية	القلق والقلق من الفشل في المستقبل	اليأس من المستقبل	القلق الذهني (قلق التفكير في المستقبل)	قلق الصحة وقلق الموت	القلق المتعلق بالمشكلات الحياتية
84، 0**	49، 0**	34، 0**	55، 0**	74، 0**	
77، 0**	42، 0**	28، 0**	43، 0**		
79، 0**	56، 0**	47، 0**			
65، 0**	53، 0**				
75، 0**					

** دالة إحصائياً عند مستوى دلالة 0، 01 * دالة إحصائياً عند مستوى دلالة 0، 05

يتضح من النتائج الموضحة في جدول (5) أن جميع أبعاد مقياس قلق المستقبل مرتبطة ببعضها وبالدرجة الكلية للمقياس، حيث تم إيجاد معاملات الارتباط بين محاور المقياس الخمسة وبين بعضها البعض، وكذلك بين كل محور وبين الدرجة الكلية للمقياس، مما نتج عنها أن معاملات الارتباط تراوحت ما بين (0، 28 – 0، 84) وهذا يزيد من الاطمئنان على ارتفاع صدق المقياس لما وضع له.

- **صدق المقارنة الطرفية (الصدق التمييزي) :** قامت الباحثة بإجراء صدق المقارنة الطرفية (الصدق التمييزي)، حيث تم ترتيب أفراد العينة الاستطلاعية (50) طالباً ترتيباً تنازلياً حسب الدرجة الكلية التي حققتها كل منهن في استجابتها على الدرجة الكلية لمقياس قلق المستقبل، ثم تم اختيار أعلى 26 % من الدرجات (وعدهن 13 ثلاث عشرة طالبة)، وأدنى 26 % من الدرجات (وعدهن 13 ثلاث عشرة طالبة)، وأخيراً تم إجراء المقارنة بين درجات المجموعتين باستخدام اختبار مان-ويتني U قامت الباحثة بإجراء صدق المقارنة الطرفية (الصدق التمييزي)، حيث تم ترتيب أفراد العينة الاستطلاعية (50) خمسين طالبة ترتيباً تنازلياً حسب الدرجة الكلية التي حققتها كل منهن في استجابتها عن الدرجة الكلية لمقياس قلق المستقبل، ثم تم اختيار أعلى 26 % من الدرجات (وعدهن 13 ثلاث عشرة طالبة)، وأدنى 26 % من الدرجات (وعدهن 13 ثلاث عشرة طالبة)، وأخيراً تم إجراء المقارنة بين درجات المجموعتين باستخدام اختبار مان-ويتني U، وذلك لكون عدد الأفراد في كل مجموعة يساوي 13 ثلاث عشرة طالبة، وهو عدد قليل لا يجوز معه استخدام اختبار بارامتري كاختبار (ت)، بالإضافة لكون اختبار U

مصمم للتوزيعات الصغيرة، المتجانسة منها وغير المتجانسة (علام، ١٩٩٣) ؛ وتبين من النتائج وجود فروق دالة إحصائية عند مستوى دلالة أقل من 0.01 بين منخفضي ومرتفعي الدرجات على مقياس قلق المستقبل، الأمر الذي يدل على صلاحية المقياس للتمييز بين مستويات القلق لدى أفراد العينة.

• **ثبات أداة الدراسة :** استخدمت الباحثة طريقة كرونباخ (معامل ألفا) حيث تم حساب معامل ألفا على عينة من الدراسة وبلغ معامل الثبات (0، 86) وهو معامل ثبات مرتفع للمقياس، مما يعطي مؤشراً للباحثة على صلاحية استخدام المقياس في التطبيق الميداني .

❖ **مقياس درجة التوافق مع الحياة الجامعية :** استخدمت الباحثة المقياس الذي أعده بيكر وسيرك Baker & Siryk وتعريف وتقنين عبدالسلام (2008) وهو أداة للتقدير الذاتي، متعدد الأبعاد بهدف القياس الكمي لتوافق طلاب وطالبات الجامعة مع الحياة الجامعية، ويتكون المقياس في صورته النهائية من (36 عبارة) تقيس أربع أبعاد هي:

البعد الأول : التوافق الأكاديمي : ويتكون من 15 عبارة أرقامها (3-12-13-14-15-16-17-21-25-26-28-30-31-35-36) .

البعد الثاني : التوافق الاجتماعي : ويتكون من 5 عبارات أرقامها(4-7-19-24-29) .

البعد الثالث : التوافق العاطفي / الشخصي : ويتكون من 8 عبارات (2-6-8-9-18-20-23-27) .

البعد الرابع : الالتزام بتحقيق الأهداف : ويتكون من 8 ثنائي عبارات أرقامها (1-5-10-11-22-32-33-34) . (عبدالسلام، 2008) .

مفاتيح التصحيح : يجيب المفحوص على البنود باختيار الإجابة التي تتلاءم معه، طبقاً للإجابات الآتية : "تنطبق تماماً" وتأخذ ثلاث درجات ، و "تنطبق إلى حد ما " وتأخذ درجتين، و "لا تنطبق " وتأخذ درجة واحدة .

- **صدق وثبات المقياس لـ (عبدالسلام، 2008):**

• **صدق المقياس:**

♦ **الصدق الظاهري :** قام معرّب المقياس بتقنين هذا المقياس عام(2006) على عينة من طلاب الإعداد التربوي بجامعة أم القرى؛ وقد بلغ معامل الثبات عن طريق إعادة التطبيق (0، 70) ومعامل الثبات عن طريقة التجزئة النصفية(0، 61) .

♦ **الصدق العاملي:** تم حساب الصدق العاملي لمقياس التوافق مع الحياة الجامعية، على عينة قوامها ن=100 من طلاب الجامعة من الكليات النظرية والعلمية وبعض المعاهد العليا، وأظهرت النتائج تشبع الأبعاد الأربعة للمقياس على عامل واحد يستوعب (78، 9) من التباين .

جدول (6)

تشبع الأبعاد الأربعة لمقياس درجة التوافق مع الحياة الجامعية

الأبعاد	تشبعات العوامل	الاشتراكات
التوافق الأكاديمي	88 ، 0	82 ، 0
التوافق الاجتماعي	93 ، 0	73 ، 0
التوافق العاطفي	92 ، 0	84 ، 0
الالتزام بتحقيق الأهداف	89 ، 0	78 ، 0
الجزء الكامن	14 ، 3	
نسبة التباين	9 ، 78 %	

يتضح من الجدول (6) أن الأبعاد الأربعة للمقياس تشبع على عامل واحد مما يدل على أن درجة صدق المقياس مرتفعة (عبدالسلام، 2008).

• **ثبات المقياس:** قام معرّب المقياس بحساب الثبات والصدق على عينة قوامها ن=50 طالباً وطالبة جامعية في مصر وباستخدام معامل كرونباخ والتجزئة النصفية .

جدول (7)

التجزئة النصفية لمقياس درجة التوافق مع الحياة الجامعية

الأبعاد	معامل ثبات الفاكرونباخ	التجزئة النصفية	معادلة "جتمان"
التوافق الأكاديمي	74 ، 0	72 ، 0	75 ، 0
التوافق الاجتماعي	71 ، 0	74 ، 0	76 ، 0
التوافق العاطفي	86 ، 0	85 ، 0	83 ، 0
الالتزام بتحقيق الأهداف	87 ، 0	86 ، 0	84 ، 0

يشير الجدول (7) إلى أن معاملات ثبات المقياس مابين (0، 71- 0، 87) كلها معاملات ثبات مرتفعة، وتشير إلى تمتع المقياس بدرجة جيدة من الثبات.

- التحقق من الشروط السيكومترية في الدراسة الحالية:

• صدق المقياس:

• طريقة الاتساق الداخلي (صدق التكوين) : يعتبر الصدق البنائي أحد مقاييس صدق الأداة الذي يقيس مدى تحقق الأهداف التي تريد الأداة الوصول إليها، ويبين مدى ارتباط كل مجال من مجالات الدراسة بالدرجة الكلية لفقرات المقياس.

جدول (8)

معاملات ارتباط أبعاد مقياس درجة التوافق مع الحياة الجامعية ببعضها وبالدرجة الكلية

الدرجة الكلية	الالتزام بتحقيق الأهداف	التوافق العاطفي	التوافق الاجتماعي	التوافق الأكاديمي
79, 0**	39, 0**	14, 0*	25, 0**	
57, 0**	32, 0**	21, 0**		
49, 0**	63, 0**			
69, 0**				

** دالة إحصائياً عند مستوى دلالة 0, 01 * دالة إحصائياً عند مستوى دلالة 0, 05

يتضح من النتائج الموضحة في جدول (8) أن جميع أبعاد مقياس درجة التوافق مع الحياة الجامعية مرتبطة ببعضها وبالدرجة الكلية للمقياس، حيث تم إيجاد معاملات الارتباط بين محاور المقياس الأربعة وبين بعضها بعضاً، وكذلك بين كل محور وبين الدرجة الكلية للمقياس، مما نتج عنها أن معاملات الارتباط تراوحت ما بين (0, 15 – 0, 79) وهذا يزيد من الاطمئنان على ارتفاع صدق المقياس لما وضع له.

• صدق المقارنة الطرفية (الصدق التمييزي): قامت الباحثة بإجراء صدق المقارنة الطرفية (الصدق التمييزي)، حيث تم ترتيب أفراد العينة الاستطلاعية (50) خمسين طالبة ترتيباً تنازلياً حسب الدرجة الكلية التي حققتها كل منهن في استجابتها على الدرجة الكلية لمقياس التوافق مع الحياة الجامعية، ثم تم اختيار أعلى 26 % من الدرجات (وعدهن 13 طالبة)، وأدنى 26 % من الدرجات (وعدهن أيضاً 13 طالبة)، وأخيراً تم إجراء المقارنة بين درجات المجموعتين باستخدام اختبار مان-ويتني U، وذلك لكون عدد الأفراد في كل مجموعة يساوي 13 ثلاث عشرة طالبة، وهو عدد قليل لا يجوز معه استخدام اختبار بارامتري كاختبار (ت)، بالإضافة لكون اختبار U مصمم للتوزيعات الصغيرة، المتجانسة منها وغير المتجانسة (علام، 1993)، وتبين من النتائج وجود فروق دالة إحصائياً عند مستوى دلالة أقل من 0, 01 بين منخفضي ومرفعي الدرجات على مقياس التوافق مع الحياة الجامعية الأمر الذي يدل على صلاحية المقياس للتمييز بين مستويات التوافق مع الحياة الجامعية لدى أفراد العينة.

• ثبات أداة الدراسة: استخدمت الباحثة طريقة كرونباخ (معامل ألفا): حيث تم حساب معامل ألفا على عينة من الدراسة وبلغ معامل الثبات (0, 66) وهو معامل ثبات مرتفع للمقياس، مما يعطي مؤشراً للباحثة على صلاحية استخدام المقياس في التطبيق الميداني.

رابعاً: أساليب المعالجة الإحصائية :

لتحقيق أهداف الدراسة وتحليل البيانات التي تم تجميعها، فقد تم استخدام العديد من الأساليب الإحصائية المناسبة، باستخدام الحزم الإحصائية للعلوم الاجتماعية، والتي يرمز لها اختصاراً بالرمز (SPSS)، وذلك بعد أن تم ترميز وإدخال البيانات إلى الحاسب الآلي، ثم استخدام الأساليب الإحصائية التالية :

- 1- التأكد من صدق الاتساق الداخلي للمقياس، وذلك بإيجاد معامل "ارتباط بيرسون" بين كل مجال والدرجة الكلية للمقياس .
- 2- التأكد من ثبات المقياس، وذلك بإيجاد معامل الثبات بطريقة "الفا كرونباخ وطريقة التجزئة النصفية".
- 3- استخدام أسلوب معامل الارتباط بيرسون لقياس العلاقة الارتباطية بين المتغيرات.
- 4- اختبار (ت) T-test لمعرفة الفروق بين متوسطات درجات الطالبات في المتغيرات المعنية في الدراسة الحالية .

خامساً: إجراءات الدراسة:

قامت الباحثة باتباع الخطوات التالية في إعداد وتطبيق الدراسة:

- تسليط الضوء على ما ورد في التراث النفسي من أطر نظرية ودراسات وأبحاث سابقة، اهتمت بمجال موضوع الدراسة الحالية.
- تحديد الأدوات المناسبة ؛ حيث تم اختيار كل من : مقياس قلق المستقبل، إعداد شقير (2005) ملحق رقم(1)، ومقياس درجة التوافق مع الحياة الجامعية إعداد بيكر و سيرك ترجمة عبدالسلام (2008) ملحق رقم(2)، وتم التأكد من صدق وثبات أدوات الدراسة على البيئة السعودية من خلال مراجعة الدراسات السابقة .
- التحقق من صدق وثبات أدوات الدراسة بالطرق الإحصائية المناسبة كما تم توصيفها في أدوات الدراسة.
- اختيار عينة الدراسة الممثلة لمجتمع الدراسة بطريقة عشوائية طبقية متساوية ؛ كما تم توصيفها في عينة الدراسة.
- الحصول على خطاب رسمي من رئيسة برنامج الدراسات العليا التربوية بجامعة الملك عبد العزيز، موجّه لعميد جامعة الطائف بفرع تربة ؛ المتضمن تسهيل مهمة الباحثة في تطبيق المقياس .
- الحصول على موافقة وكالة الدراسات الجامعية لجامعة الطائف بفرع تربة على تطبيق مقاييس الدراسة، وتم الحصول على خطاب رسمي بذلك .
- تطبيق أدوات الدراسة للتحقق من فروض الدراسة في الفصل الدراسي الثاني من العام الجامعي 1435/1434 هـ على عينة الدراسة؛ والتي تبلغ (200) طالبة، وقد استغرق تطبيق المقياسين نصف ساعة للطالبة، بعد إلقاء التعليمات وتوضيح طريقة الاستجابة، وأهداف أدوات الدراسة وأهميتها، والفائدة المرجوة منها، حيث طبقت بصورة جماعية للطالبات .
- جمع البيانات وتفرغها لمعالجتها إحصائياً في ضوء فروض الدراسة .

- استخلاص النتائج وتفسيرها ومناقشتها .
- صياغة وتقديم التوصيات والمقترحات في ضوء نتائج الدراسة.
- إعداد ملخص الدراسة باللغتين العربية والانجليزية.

الفصل الخامس

نتائج الدراسة ومناقشتها

يسير هذا الفصل في انساق مع تساؤلات الدراسة، حيث يتضمن عرضاً وتحليلاً لنتائج الدراسة الميدانية، بعد تطبيق أداة الدراسة على العينة المختارة، ومعالجة البيانات إحصائياً مع الاستعانة بالدراسات السابقة في التعليق على النتائج، وملخص للدراسة وأهم النتائج التي توصلت إليها في الجانب العملي؛ بالإضافة إلى تقديم أهم التوصيات والمقترحات في ضوء نتائج الدراسة الحالية، وتسهيلاً لعرض نتائج الدراسة، قامت الباحثة بعرضها على النحو التالي:

أولاً: نتائج الدراسة ومناقشتها وتفسيرها

❖ **عرض وتحليل النتائج المتعلقة بالفرض الأول ومناقشتها:** للتحقق من صحة الفرض الأول الذي ينص على أنه " توجد علاقة ارتباطية ذات دلالة إحصائية بين درجات مقياس قلق المستقبل ودرجات مقياس التوافق مع الحياة الجامعية لدى عينة من طالبات جامعة الطائف بفرع تربة "، تم استخدام معامل ارتباط بيرسون وسوف نتناول الباحثة الجداول الآتية لعرض وتحليل النتائج الخاصة بالفرض الأول.

جدول (9)

العلاقة الارتباطية بين قلق المستقبل ودرجة التوافق مع الحياة الجامعية

أبعاد التوافق مع الحياة الجامعية	التوافق الأكاديمي	التوافق الاجتماعي	التوافق العاطفي	الالتزام بتحقيق الأهداف	التوافق مع الحياة الجامعية ككل
أبعاد قلق المستقبل					
القلق المتعلق بالمشكلات الحياتية	0، 13	0-، 02	0، 25**	0-، 14*	0، 09
قلق الصحة وقلق الموت	0، 08	0-، 02	0، 22**	0-، 10	0، 08
القلق الذهني (قلق التفكير في المستقبل)	0-، 11	0-، 11	0، 13	0-، 31**	0-، 16*
اليأس من المستقبل	0-، 03	0-، 13	0، 05	0-، 13	0-، 08
الخوف والقلق من الفشل في المستقبل	0، 01	0-، 04	0، 14	0-، 23**	0-، 06
قلق المستقبل ككل	0، 03	0-، 08	0، 21**	0-، 23**	0-، 03

*دالة إحصائية عند مستوى معنوية 0، 05

**دالة إحصائية عند مستوى معنوية 0، 01

يتضح من الجدول (9) الآتي:

• وجود علاقة ارتباطية سالبة ذات دلالة إحصائية عند مستوى 0، 05 بين القلق المتعلق بالمشكلات الحياتية؛ والالتزام بتحقيق الأهداف، حيث كانت قيمة معامل ارتباط بيرسون (0-، 14)، وذلك يدل على أنه إذا زاد القلق المتعلق بالمشكلات الحياتية، قلّ الالتزام بتحقيق الأهداف لدى أفراد العينة والعكس صحيح، حيث ترى الباحثة، أن مواجهة الطالبة لضغوط نفسية من البيئة التي تعيش فيها قد تسبب لها التوتر وعدم التكيف، والنظرية الإنسانية تعتبر الإحباط من أهم الأسباب المؤدية إلى التوتر النفسي، كما ويعتبر من المعوقات الأساسية لفهم الذات وعدم تحقيق الغاية الأساسية للفرد (زهران، 2003) إن قلق المستقبل يختلف في شدته تبعاً للفروق الاجتماعية والمؤثرة حتماً على نفسية الشخص، ومن أهمها المشكلات الاجتماعية التي يعاني منها الشخص منذ البداية، أي من مرحلة الطفولة، ألا وهي المشكلات الأسرية مثل حالة الطلاق، والعامل الاقتصادي هو الآخر له تأثير على مستوى قلق المستقبل للفرد، فكلما قلّ أو انخفض الدخل الشهري للفرد، كلما ارتفع مستوى القلق لديه، لأنه يمثل جزءاً من الحاجز الذي يحول دون تحقيق الأهداف والطموحات (المحاميد و السفاسفة، 2007)

• وجود علاقة ارتباطية موجبة ذات دلالة إحصائية عند مستوى 0، 01 بين القلق المتعلق بالمشكلات الحياتية، والتوافق العاطفي حيث كانت قيمة معامل ارتباط بيرسون (0، 25)، وذلك يدل على أنه إذا زاد القلق المتعلق بالمشكلات الحياتية، زاد التوافق العاطفي لدى أفراد العينة والعكس صحيح، وتفسر الباحثة ذلك، بأن طبيعة البيئة المحافظة التي تعيش فيها الطالبات قد تؤدي إلى تعرض الطالبة لبعض المشكلات في حياتها اليومية، و سبب بحثها عن المساندة الاجتماعية من المحيطين بها كمحاولة للتكيف مع المشكلات التي قد تواجهها و للتقليل من مشاعر القلق الناتجة عن تعرضها لهذه المشكلات ولزيادة ثققتها بنفسها بأنها قادرة على تجاوز هذه المشكلة، وهذا مدعاة لتقوية الروابط الاجتماعية التي تربط الطالبة بالمحيطين بها، وحسب الاتجاه الإنساني فإن الفرد له حاجات شخصية واجتماعية تتمثل بالترابط الأسري والترابط الاجتماعي للفرد بالآخرين وإثبات الذات، ويكون الشخص مقبولا اجتماعياً عندما يكون مألوفاً ومحبوفاً من قبل الآخرين، فهذا التآلف يجعله متفاعلاً ومتعاوناً مع أسرته ومع المجتمع متفانلاً سعيداً (المصري، 2010)

• وجود علاقة ارتباطية موجبة ذات دلالة إحصائية عند مستوى 0، 01 بين قلق الصحة وقلق الموت والتوافق العاطفي حيث كانت قيمة معامل ارتباط بيرسون (0، 22)، وذلك يدل على أنه إذا زاد قلق الصحة وقلق الموت زاد التوافق العاطفي لدى أفراد العينة والعكس صحيح، فحسب الاتجاه الإنساني إن توقع فجائية حدوث الموت هو المثير الأساسي للقلق عند الإنسان ومن هنا نجد أن الفرد يسعى إلى أن يكون متوافقاً عاطفياً، حيث أن التوتر النفسي في مفهوم روجرز ناتج عن ضغوط تلبية الحاجات الخاصة ببناء الذات؛ كالحاجة إلى الشعور بالأمن النفسي والحب ومن هنا يزداد تقدير الطالبة لذاتها واستجابتها نحو نفسها والآخرين.

• وجود علاقة ارتباطية سالبة ذات دلالة إحصائية عند مستوى 0، 01 بين القلق الذهني (قلق التفكير في المستقبل) والالتزام بتحقيق الأهداف، حيث كانت قيمة معامل ارتباط بيرسون (0-، 31)، وذلك يدل على أنه إذا زاد القلق الذهني (قلق التفكير في المستقبل)، قلّ الالتزام بتحقيق الأهداف لدى أفراد العينة والعكس صحيح، فالتفكير في المستقبل من الأمور التي تشغل بال الطالبة وعدم الوصول إلى تحقيق الأهداف التي وضعتها بداية دخولها للجامعة في ظل التغير السريع في المجتمع وأزمة البطالة قد يسبب لها القلق، وحسب النظرية المعرفية فإن ذلك يرجع إلى أساليب التفكير لدى الطالبة، فالطالبة التي لديها أفق واسع وتفكير متفائل، يصبح لديها الدافع للعمل والإقبال على الحياة؛ بينما الطالبة التي تفكيرها محدود يدفعها للهروب من الحياة، فالتفكير بالمستقبل يعتبر أحد العوامل الأساسية المسببة للقلق (العناني، 2000)

♦ وجود علاقة ارتباطية سالبة ذات دلالة إحصائية عند مستوى 0, 05 بين القلق الذهني (قلق التفكير في المستقبل) والتوافق مع الحياة الجامعية ككل، حيث كانت قيمة معامل ارتباط بيرسون (-0, 16)، ويدل ذلك على أنه إذا زاد القلق الذهني (قلق التفكير في المستقبل) قلّ التوافق مع الحياة الجامعية ككل لدى أفراد العينة، والعكس صحيح، حيث يؤكد أصحاب الاتجاه المعرفي على نموذج إدراك المواقف الحياتية حيث يرى أصحاب هذه النظرية أنّ تقييم الفرد الأولي للموقف يحدّد أساليبه في التوافق وقد تكون سلبية أو إيجابية في إطار علاقته بالبيئة وتقييمه المعرفي للموقف، كما أنّ زيادة القلق الذهني لدى الطالبات قد تجعلهن غير قادرات على اتباع التعليمات التدريسية، وتنظيم العمل داخل الجامعة، ممّا يؤثر على بيئة التعلم لديهن، ويؤكد بيك Beck أنّ الاضطرابات الانفعالية ما هي إلا نتائج اضطراب في تفكير الفرد وما يعتقد به من معتقدات وأفكار، والتي بواسطتها يمكن أن يفسر الأحداث من حوله. (حسين، 2007)

♦ وجود علاقة ارتباطية سالبة ذات دلالة إحصائية عند مستوى 0, 01 بين الخوف والقلق من الفشل في المستقبل؛ والالتزام بتحقيق الأهداف حيث كانت قيمة معامل ارتباط بيرسون (-0, 23)، ويدل ذلك على أنه إذا زاد الخوف والقلق من الفشل في المستقبل قلّ الالتزام بتحقيق الأهداف لدى أفراد العينة والعكس صحيح، وتفسر الباحثة هذه النتيجة، بأنّ المستقبل لدى الطالبات مرتبط بالقدرّة على بناء أهداف شخصية بعيدة المدى والالتزام بها والعمل على تحقيقها، وهو مكون أساسي لسلوك الطالبة، وحسب النظرية الإنسانية القلق ينشأ مما يتوقع الإنسان حدوثه، وعدم القدرة من الناحية النفسية على إنجاز الخطط المستقبلية بعيدة المدى، يرتبط بارتفاع مستوى قلق المستقبل وقد تصاب الطالبة بالإحباط، كما أنّ التردّد والشكّ والقلق من المستقبل كلها عوامل تؤثر بالسلب على الالتزام بالهدف وتحقيقه. (حسين، 2007)

♦ وجود علاقة ارتباطية موجبة ذات دلالة إحصائية عند مستوى 0, 01 بين قلق المستقبل ككل والتوافق العاطفي حيث كانت قيمة معامل ارتباط بيرسون (0, 21)، و يدل ذلك على أنه إذا زاد قلق المستقبل ككل، زاد التوافق العاطفي لدى أفراد العينة والعكس صحيح، إنّ تعرّض الطالبة للظروف المثيرة لقلق المستقبل، يجعلها تتفاعل مع البيئة المحيطة بها وفقاً لقدراتها وإمكاناتها لإشباع حاجاتها ورغباتها، والقدرة على مواجهة متطلبات الحياة. ومن العوامل المهمة لتعزيز الذات، نمو العلاقات الاجتماعية والدور السلوكي للأفراد، وهذا بدوره يعطي تغذية راجعة للفرد من أجل تعديل سلوكه نحو الأفضل. (حسين و عبد الأليمة، 2011).

♦ وجود علاقة ارتباطية سالبة ذات دلالة إحصائية عند مستوى معنوية 0, 01 بين قلق المستقبل ككل والالتزام بتحقيق الأهداف حيث كانت قيمة معامل ارتباط بيرسون (-0, 23)، وذلك يدل على أنه إذا زاد قلق المستقبل ككل، قلّ الالتزام بتحقيق الأهداف لدى أفراد العينة والعكس صحيح، وحسب النظرية الإنسانية الفرد الذي يشعر بالقلق يعيش مجموعة من المشاعر والأحاسيس غير المرغوبة ومنها التوتر وضعف التركيز، وهذا يعني بأنّ ازدياد مستوى قلق المستقبل يصاحبه انخفاض مستوى الطموح، فيعد أن كان المستقبل مصدراً للأهداف وتحقيق الأمال، قد يصبح مصدراً للخوف، وهذا المصدر يعدّ أساس قلق المستقبل ولاسيما عدم الحصول على عمل أو مهنة تحقق طموحاته وغاياته وتحقق له الرضا عن الحياة. (المصري، 2011)

❖ **عرض وتحليل النتائج المتعلقة بالفرض الثاني ومناقشتها :** للتحقق من صحة الفرض الثاني الذي ينص على أنه " توجد فروق ذات دلالة إحصائية بين متوسطات درجات مقياس قلق المستقبل بأبعاده المختلفة لدى عينة الدراسة تبعاً لمتغير التخصص الدراسي (العلمي - الأدبي) "، تمّ استخدام اختبار T – test لمقارنة متوسطات درجات عيّنتين في مقياس قلق المستقبل بأبعاده المختلفة، وسوف نتناول الباحثة الجداول الآتية لعرض وتحليل النتائج الخاصة بالفرض الثاني.

جدول(10)

نتائج اختبار T – test لدلالة الفروق بين متوسطات درجات عينة الدراسة في مقياس قلق المستقبل تبعاً للتخصص الدراسي

أبعاد قلق المستقبل	التخصص	المتوسط الحسابي	الانحراف المعياري	قيمة T	درجة الحرية	Sig	مستوى الدلالة
القلق المتعلق بالمشكلات الحياتية	أدبي	88, 2	04, 1	33, 0	198	74, 0	غير دالة
	علمي	84, 2	90, 0				
قلق الصحة وقلق الموت	أدبي	54, 2	81, 0	07, 0-	198	94, 0	غير دالة
	علمي	55, 2	80, 0				
القلق الذهني (قلق التفكير في المستقبل)	أدبي	41, 2	71, 0	49, 0-	198	62, 0	غير دالة
	علمي	45, 2	56, 0				
اليأس من المستقبل	أدبي	91, 1	62, 0	69, 0-	198	49, 0	غير دالة
	علمي	96, 1	55, 0				
الخوف والقلق من الفشل في المستقبل	أدبي	75, 1	67, 0	47, 1	198	14, 0	غير دالة
	علمي	63, 1	49, 0				
قلق المستقبل ككل	أدبي	29, 2	60, 0	05, 0	198	96, 0	غير دالة
	علمي	29, 2	49, 0				

- يوضح الجدول (10) أنّ قيمة الدلالة لكل أبعاد مقياس قلق المستقبل أكبر من 0, 05 ولذا فيمكن قبول الفرض الصفري الذي ينص على أنه " لا توجد فروق ذات دلالة إحصائية بين متوسطات درجات مقياس قلق المستقبل بأبعاده المختلفة لدى عينة الدراسة تبعاً لمتغير التخصص الدراسي (العلمي - الأدبي) "، وهذا يتفق مع دراسة القرشي (2012) و دراسة فرج ومحمود (2006)، وتعارض مع دراسة كل من النوري (2012)، والسبعوي (2010) فقد أشارت إلى وجود فروق بين درجات التخصص الدراسي لصالح التخصص العلمي في قلق المستقبل، وأشارت دراسة مندوة (2006)، والثنيان (2009)، ورمضان (2010)، والمشيخي (2009) إلى وجود فروق في درجات قلق المستقبل لصالح التخصص الأدبي، وتفسر الباحثة النتيجة نظراً لتشابه الظروف والعوامل الجامعية والأكاديمية والوظيفية والاقتصادية والسياسية والأمنية بين جميع الطالبات، ويمكن القول أنّ جميع مشكلات الطالبات تكاد تكون واحدة سواء من الأقسام الأدبية أو من الأقسام العلمية، فمشكلاتهن تدور حول الصعوبة في إيجاد فرصة عمل مناسبة، كما أنّ قلق المستقبل لدى جميع الطالبات الجامعيات لا يتوقف عند حدّ التخصص؛ بل كثرّت وتعددت أسبابه، لذلك من الضروري اهتمام المؤسسات التربوية بمناقشة مشكلات الطالبات، وأسلوب حياتهن والعمل على حلها. (القرشي، 2012)

❖ **عرض وتحليل النتائج المتعلقة بالفرض الثالث ومناقشتها :** للتحقق من صحة الفرض الثالث الذي ينص على أنه " توجد فروق ذات دلالة إحصائية بين متوسطات درجات مقياس قلق المستقبل بأبعاده المختلفة لدى عينة الدراسة تبعاً لمتغير الفرقة الدراسية (الأولى - الرابعة) "؛ تمّ استخدام اختبار T – test لمقارنة متوسطات درجات عيّنتين في مقياس قلق المستقبل بأبعاده المختلفة، وسوف نتناول الباحثة الجداول الآتية لعرض وتحليل النتائج الخاصة بالفرض الثالث.

جدول (11)

نتائج اختبار $T - test$ لدلالة الفروق بين متوسطات درجات عينة الدراسة في مقياس قلق المستقبل تبعاً للفرقة الدراسية

أبعاد قلق المستقبل	الفرقة	المتوسط الحسابي	الانحراف المعياري	قيمة T	درجة الحرية	Sig	الدلالة
القلق المتعلق بالمشكلات الحياتية	الفرقة الأولى	94 ، 2	89 ، 0	26 ، 1	197	21 ، 0	غير دالة
	الفرقة الرابعة	77 ، 2	05 ، 1				
قلق الصحة وقلق الموت	الفرقة الأولى	60 ، 2	82 ، 0	06 ، 1	198	29 ، 0	غير دالة
	الفرقة الرابعة	48 ، 2	78 ، 0				
القلق الذهني (قلق التفكير في المستقبل)	الفرقة الأولى	48 ، 2	59 ، 0	02 ، 1	198	31 ، 0	غير دالة
	الفرقة الرابعة	38 ، 2	68 ، 0				
اليأس من المستقبل	الفرقة الأولى	03 ، 2	59 ، 0	23 ، 2	198	03 ، 0	دالة
	الفرقة الرابعة	84 ، 1	57 ، 0				
الخوف والقلق من الفشل في المستقبل	الفرقة الأولى	75 ، 1	61 ، 0	42 ، 1	198	16 ، 0	غير دالة
	الفرقة الرابعة	63 ، 1	56 ، 0				
قلق المستقبل ككل	الفرقة الأولى	35 ، 2	52 ، 0	75 ، 1	198	08 ، 0	غير دالة
	الفرقة الرابعة	22 ، 2	56 ، 0				

يوضح جدول (11) أنَّ قيمة الدلالة لكلِّ أبعاد مقياس قلق المستقبل أكبر من 0، 05 ولذا فيمكن قبول الفرض الصفري، الذي ينص على أنَّه " لا توجد فروق ذات دلالة إحصائية بين متوسطات درجات مقياس قلق المستقبل بأبعاده المختلفة لدى عينة الدراسة ترجع إلى متغير الفرقة الدراسية (الأولى – الرابعة)"، بمعنى آخر لا توجد فروق بين طالبات الفرقة الرابعة وطالبات الفرقة الأولى في المظاهر السلوكية التالية : الإيمان بالقضاء والقدر، والذي يعود إلى الأساس الراسخ للدين في قلوب الطالبات، والخوف والقلق من المستقبل. القرشي (2012)، وهذا يتفق مع دراسة القرشي (2012)، أما دراسة مندوة (2006) ودراسة المشيخي (2009) فقد أشارت إلى وجود فروق بين درجات المستوى الدراسي لصالح الفرقة الرابعة في قلق المستقبل. فيما عدا بعد اليأس من المستقبل فقد كانت قيمة الدلالة له أقل من 0، 05 ولذا فيمكن قبول الفرض البديل الذي ينص على أنَّه توجد فروق ذات دلالة إحصائية عند مستوى 0، 05 بين متوسطات إجابات أفراد عينة الدراسة في بعد اليأس من المستقبل تبعاً لمتغير الفرقة الدراسية ؛ لصالح الفرقة الأولى، ويرجع السبب في ذلك إلى أن الطالبة الجامعية في بداية دخولها للجامعة قد تواجه ضغوطاً نفسية متعددة، منها ضغوط دراسية وانفعالية، وأخرى فسيولوجية، راجعة إلى طبيعة المرحلة الجامعية التي تقابل مرحلة المراهقة المتأخرة، وما لها من مطالب نمو خاصة بهذه المرحلة التي تتميز بالطاقة والنشاط والحيوية. (المصري، 2011)

❖ **عرض وتحليل النتائج المتعلقة بالفرض الرابع ومناقشتها:** للتحقق من صحة الفرض الرابع الذي ينص على أنَّه " توجد فروق ذات دلالة إحصائية بين متوسطات درجات مقياس التوافق مع الحياة الجامعية بأبعاده المختلفة لدى عينة الدراسة تبعاً لمتغير التخصص الدراسي (العلمي – الأدبي)"، تم استخدام اختبار $T - test$ لمقارنة متوسطات درجات عيّنتين في مقياس التوافق مع الحياة الجامعية بأبعاده المختلفة، وسوف تتناول الباحثة الجداول الآتية لعرض وتحليل النتائج الخاصة بالفرض الرابع.

جدول (12)

نتائج اختبار $T - test$ لدلالة الفروق بين متوسطات درجات عينة الدراسة في مقياس التوافق مع الحياة الجامعية تبعاً للتخصص الدراسي

أبعاد مقياس التوافق مع الحياة الجامعية	التخصص	المتوسط الحسابي	الانحراف المعياري	قيمة T	درجة الحرية	Sig	مستوى الدلالة
التوافق مع الحياة الجامعية ككل	أدبي	06 ، 2	20 ، 0	004 ، 0	198	99 ، 0	غير دالة
	علمي	06 ، 2	17 ، 0				
التوافق الأكاديمي	أدبي	00 ، 2	26 ، 0	1.20	198	23 ، 0	غير دالة
	علمي	95 ، 1	21 ، 0				
التوافق الاجتماعي	أدبي	08 ، 2	34 ، 0	97 ، 0	198	33 ، 0	غير دالة
	علمي	04 ، 2	29 ، 0				
التوافق العاطفي	أدبي	88 ، 1	28 ، 0	39 ، 0-	198	69 ، 0	غير دالة
	علمي	89 ، 1	28 ، 0				
الالتزام بتحقيق الأهداف	أدبي	34 ، 2	35 ، 0	85 ، 1-	198	07 ، 0	غير دالة
	علمي	42 ، 2	31 ، 0				

– يوضح جدول (12) أنَّ قيمة الدلالة لكلِّ أبعاد مقياس التوافق مع الحياة الجامعية أكبر من 0، 05 ولذا فيمكن قبول الفرض الصفري الذي ينص على أنَّه " لا توجد فروق ذات دلالة إحصائية بين متوسطات درجات مقياس التوافق مع الحياة الجامعية بأبعاده المختلفة لدى عينة الدراسة تبعاً لمتغير التخصص الدراسي (العلمي – الأدبي)"، وتتفق هذه النتيجة مع دراسة السويلم (2013) والقُدومي وسلامة (2011)، وتعزو الباحثة ذلك إلى أنَّ طالبات التخصص العلمي والأدبي من عينة الدراسة من نفس السن تقريباً وبالتالي الفروق بينهم لا تكون واضحة ؛ كذلك الحرية التي تعطى للطالبة في اختيار تخصصها بنفسها تعطيها مجالاً واسعاً للنجاح والإبداع فيه، وبما أنَّها دخلته بناء على رغبته الخاصة إذن فهي مقتنعة وتثار من أجل أن تحصل على درجة ومكانة أفضل، كما أن حاجة المجتمع للخريجات تكون للتخصصات العلمية والأدبية، وحاجة سوق العمل إلى كثير من التخصصات العلمية والأدبية، كل ذلك قلل من إمكانية وجود فروق بينهما في درجة التوافق مع الحياة الجامعية (حجاب، 2010).

❖ عرض وتحليل النتائج المتعلقة بالفرض الخامس ومناقشتها: للتحقق من صحة الفرض الخامس الذي ينص على أنه " توجد فروق ذات دلالة إحصائية بين متوسطات درجات مقياس التوافق مع الحياة الجامعية بأبعاده المختلفة لدى عينة الدراسة تبعاً لمتغير الفرقة الدراسية (الأولى – الرابعة) "؛ تم استخدام اختبار $T - test$ لمقارنة متوسطات درجات عيّنتين في مقياس التوافق مع الحياة الجامعية بأبعاده المختلفة، وسوف تتناول الباحثة الجداول الآتية لعرض وتحليل النتائج الخاصة بالفرض الخامس.

جدول (13)

نتائج اختبار $T - test$ لدلالة الفروق بين متوسطات درجات عينة الدراسة في مقياس التوافق مع الحياة الجامعية تبعاً للفرقة الدراسية

أبعاد مقياس التوافق مع الحياة الجامعية	الفرقة	المتوسط الحسابي	الانحراف المعياري	قيمة T	درجة الحرية	Sig	مستوى الدلالة
التوافق مع الحياة الجامعية ككل	الفرقة الأولى	05، 2	19، 0	25، 0-	198	80، 0	غير دالة
	الفرقة الرابعة	06، 2	18، 0				
التوافق الأكاديمي	الفرقة الأولى	97، 1	25، 0	59، 0-	198	56، 0	غير دالة
	الفرقة الرابعة	98، 1	23، 0				
التوافق الاجتماعي	الفرقة الأولى	06، 2	32، 0	15، 0	198	88، 0	غير دالة
	الفرقة الرابعة	05، 2	31، 0				
التوافق العاطفي	الفرقة الأولى	88، 1	27، 0	07، 0-	198	94، 0	غير دالة
	الفرقة الرابعة	89، 1	29، 0				
الالتزام بتحقيق الأهداف	الفرقة الأولى	39، 2	35، 0	15، 0	198	88، 0	غير دالة
	الفرقة الرابعة	2.38	31، 0				

- يوضح جدول (13) أن قيمة الدلالة لكل أبعاد مقياس التوافق مع الحياة الجامعية أكبر من 0، 05 ولذا فيمكن قبول الفرض الصفري الذي ينص على أنه " لا توجد فروق ذات دلالة إحصائية بين متوسطات درجات مقياس التوافق مع الحياة الجامعية بأبعاده المختلفة لدى عينة الدراسة تبعاً لمتغير الفرقة الدراسية (الأولى – الرابعة)"، وتتفق هذه النتيجة مع دراسة موريس (2011)، وتتعارض مع دراسة نيكولاس وراموس (2007) و دراسة دانيال (2010) حيث أشارت إلى وجود فروق في التوافق الاجتماعي والأكاديمي لصالح الفرقة الأولى، وأما دراسة حجاب (2010) فقد أشارت إلى وجود فروق بين المستوى الدراسي لصالح الفرقة الرابعة في التوافق مع الحياة الجامعية، وتعزو الباحثة ذلك نظراً لتشابه الظروف البيئية لطالبات الجامعة عينة الدراسة، فنجد أنه من الممكن للطالبة المستجدة وكذلك المتخرجة أن تصل إلى حالة الرضا النفسي عن أداؤها الأكاديمي، وعلاقتها بزميلات الدراسة والأساتذة والتغلب على أي عوائق تحول دون إقامة علاقات ودية بينها وبين نفسها ومع بيئتها، كما أن ظروف التقدم والتطور التكنولوجي، قد تساعد الطالبة ليكون لديها القدرة على التواصل مع أغلب الطالبات المتواجدات معها بالجامعة وهذا يزيد من توافقه وتعايشها مع الصعوبات التي ستواجهها نتيجة لانتقالها إلى بيئة جديدة مختلفة كلياً عن بيئة المدرسة، وكذلك انتقالها بعد التخرج إلى مرحلة العمل، وترى الباحثة أن الطالبة تستطيع أن تصل إلى درجة توافق جيدة مع الحياة الجامعية من خلال وجود دافع قوي نحو تحقيق الذات؛ وإثبات القدرة في الاعتماد على النفس وإقامة علاقات حسنة مع كل أفراد المجتمع الجامعي، وذلك بعد تلقيها الإرشاد والتوجيه التربوي والمهني قبل تخرجها من المرحلة الثانوية وعند بداية دخولها الجامعة وعند تخرجها منها، كل ذلك سيجعل الفروق في درجة التوافق مع الحياة الجامعية التي ترجع للفرقة (الأولى – الرابعة) فروقاً ضئيلة .

ثانياً: ملخص نتائج الدراسة

توصلت الدراسة الحالية للعديد من النتائج من أهمها:

❖ وجود علاقة ارتباطية موجبة ذات دلالة إحصائية عند مستوى معنوية 0.01 بين كل من القلق المتعلق بالمشكلات الحياتية، وقلق الصحة والموت، وقلق المستقبل ككل ؛ وبين التوافق العاطفي.

❖ وجود علاقة ارتباطية سالبة ذات دلالة إحصائية عند مستوى معنوية 0.01 بين كل من القلق الذهني (قلق التفكير في المستقبل)، والقلق من الفشل في المستقبل، وقلق المستقبل ككل ؛ وبين الالتزام بتحقيق الأهداف .

❖ لا توجد فروق ذات دلالة إحصائية عند مستوى معنوية 0.05 بين متوسطات درجات أفراد عينة الدراسة في مقياس قلق المستقبل بأبعاده المختلفة و في مقياس التوافق مع الحياة الجامعية بأبعاده المختلفة تبعاً لمتغير التخصص الدراسي، وكذلك تبعاً لمتغير الفرقة الدراسية ماعدا بعد اليأس في المستقبل بالنسبة لمقياس قلق المستقبل وكان لصالح الفرقة الأولى.

ثالثاً: توصيات الدراسة

بناء على النتائج التي توصلت إليها الدراسة الحالية "قلق المستقبل وعلاقته بدرجة التوافق مع الحياة الجامعية لدى عينة من طالبات جامعة الطائف بفرع تربية" توصي الباحثة بما يلي:

- ❖ اهتمام المرشدة النفسية بمساعدة الطالبات على إدراك مشكلاتهن الاجتماعية والاقتصادية، ومحاولة إيجاد حلول لها عن طريق البرامج الإرشادية المناسبة.
- ❖ تتعرف المرشدة النفسية على الاحتياجات النفسية والاجتماعية لطالبات الجامعة، عن طريق إجراء مجموعة من البحوث النفسية والاجتماعية عليهن وتهيئة البيئة المناسبة لمواجهة القلق والتغلب عليه وزيادة التوافق مع الحياة الجامعية.

- ❖ اهتمام لجنة التوجيه والإرشاد بالجامعة بإعداد البرامج الإرشادية للطالبات، والتي تساعد على تقوية وتعزيز الفاعلية الذاتية لدى طالبات المرحلة الجامعية وزرع روح التفاؤل والأمل بالمستقبل.
- ❖ إقامة الندوات والمحاضرات وفتح قنوات الحوار من قبل المرشدة النفسية مع الطالبات، من أجل توعيتهن ووقايتهن من الاضطرابات النفسية.
- ❖ إنشاء كراسٍ علمية في الجامعات من قبل وزارة التعليم العالي، والجهات الخيرية لدراسة وتقوية حاجات ومتطلبات توافق الطالبات مع الحياة الجامعية .
- ❖ قيام الباحثين والباحثات في مجال التوجيه والإرشاد التربوي بإجراء البحوث العلمية على مجتمع من الطالبات لبحث جوانب نفسية أخرى، كالتوافق الأكاديمي، وإجراء بحوث مشابهة للبحث الحالي على فئات اجتماعية أخرى.
- ❖ إنشاء مركز الإرشاد النفسي في الجامعة من قبل وزارة التعليم العالي للتعرف على المشكلات المستقبلية للطالبات، ولتقديم الخدمات الإرشادية للطالبات، بالصورة التي تساعدن على التوافق مع الحياة الجامعية .
- ❖ قيام المرشدات المهنيات بتوعية الطالبات نحو مستقبلهن من خلال إقامة الدورات وورش العمل للكشف عن إمكاناتهن الحقيقية، وتعليمهن مهارات التخطيط للمستقبل على أسس سليمة، حتى لا يقعن فريسة التوافق غير الفعال.

رابعاً: البحوث والدراسات المقترحة

- في ضوء النتائج التي تم التوصل إليها توصي الباحثة بإجراء ما يلي :
- ❖ دراسة حول قلق المستقبل، وعلاقته بالصحة النفسية لدى عينة من طالبات جامعة الطائف.
 - ❖ إجراء دراسة مشابهة حول القلق، وعلاقته بمتغيرات ديموغرافية ونفسية لم يتناولها البحث الحالي.
 - ❖ دراسة القلق والضغوط النفسية، وعلاقتهما بالتحصيل الدراسي لدى طالبات الجامعة.
 - ❖ دراسة قلق المستقبل وعلاقته بالانحياز الانفعالي لدى طالبات الجامعة.
 - ❖ دراسة التوافق مع الحياة الجامعية وعلاقته بالصلاية النفسية لدى طالبات الجامعة .
 - ❖ دراسة التوافق الجامعي، وعلاقته بالتفاؤل والتشاؤم، ومستوى الطموح لدى طالبات الجامعة.

المراجع

المصادر:

القرآن الكريم

1- المراجع العربية:

- إبراهيم، إبراهيم محمود (2006 م) . فاعلية الإرشاد العقلاني الانفعالي في خفض قلق المستقبل لدى طلاب التعليم الفني . رسالة ماجستير غير منشورة، جامعة أسيوط، كلية التربية.
- أبو سكران، عبدالله يوسف (2009 م) . التوافق النفسي والاجتماعي وعلاقته بمركز الضبط (الداخلي – الخارجي) للمعوقين حركياً بقطاع غزة . رسالة ماجستير غير منشورة . كلية التربية، جامعة غزة .
- أبو الهدى، إبراهيم محمود (2012 م) . قلق المستقبل وعلاقته بمعنى الحياة لدى عينة من الطلاب المصريين المقيمين بالخارج وأقرانهم البحرينيين. **مجلة الإرشاد النفسي، مصر**، ع33 ص ص 141-180.
- الأقصري، يوسف (2002 م) . **كيف تتخلص من الخوف والقلق من المستقبل ؟** . القاهرة : دار اللطائف للنشر والتوزيع.
- بدر، إسماعيل إبراهيم (1993 م) . تخفيف قلق المستقبل لدى طلبة الجامعة . **المجلة المصرية للدراسات النفسية**، مجلد 14 (ع 6)، ص8.
- الثيان، احمد عبدالله (2009 م) . جودة الحياة وقلق المستقبل لدى طلاب المرحلة الجامعية . رسالة دكتوراه غير منشورة، جامعة أم القرى .
- جمال الليل، محمد جعفر (2005 م) . بناء مقياس القلق العام للأطفال والمراهقين . سلسلة البحوث التربوية والنفسية، معهد البحوث العلمية، **مركز البحوث التربوية والنفسية**، ط(2)، جامعة أم القرى.
- حجاب، عنايات أحمد حجازي (2010 م) . الفروق في التوافق مع الحياة الجامعية باختلاف طبيعة الشعب الدراسية بكلية التربية النوعية . المؤتمر السنوي (العربي الخامس – الدولي الثاني)، في الفترة 14-15 ابريل، ص ص 326-358.
- حسان، منال رضا (2009 م) . الصلابة النفسية في علاقتها بقلق المستقبل لدى عينة من معلمات طفل ما قبل المدرسة بمحافظة الغربية . **مجلة كلية التربية** . جامعة طنطا - مصر . (ع 40) ص ص 18-226.
- حسن، ثائر رشيد ؛ صالح، مهدي صالح (2008 م) . تأثير برنامج إرشادي تعليمي لزيادة تكيف طالبات كلية التربية الرياضية مع الحياة الجامعية. **مجلة علوم التربية الرياضية** - العراق، مجلد (1)، (عدد 9) ص351 .
- حسين، طه عبد العظيم ؛ سلامة عبد العظيم (2006 م) . استراتيجيات إدارة الضغوط التربوية والنفسية . ط (1)، دار الفكر، عمان .
- حسين، عبد العظيم طه (2007 م) . **العلاج النفسي المعرفي** . مفاهيم وتطبيقات . ط1، الإسكندرية، دار الوفاء لدنيا الطباعة والنشر.
- حسين، علي عبد الحسن؛ عبد البية، حسين عبد الزهرة (2011) . التوافق النفسي والاجتماعي وعلاقته بتقدير الذات لدى طلبة كلية التربية الرياضية. **مجلة القادسية لعلوم التربية الرياضية**، مجلد (11)، ع (3)، ص ص 123-124 .
- حمزة، جمال مختار (2005 م) . قلق المستقبل لدى أبناء العاملين بالخارج . **مجلة العلوم التربوية**، جامعة القاهرة، العدد 1 .
- الخالدي، أديب (2002 م) . **مرجع في الصحة النفسية** . عربان، ليبيا :الدار العربية
- الداهري، صالح حسن (2005 م) . **مبادئ الصحة النفسية** . ط1، الأردن، دار وائل للنشر .
- داينز، روبين (2006 م) . **إدارة القلق** . القاهرة، ترجمة دار الفروق .
- رمضان، ماجد أحياب (2010 م) . قلق المستقبل وعلاقته ببعض المتغيرات لدى طلبة كليات التربية . **مجلة جامعة الأنبار للعلوم** - العراق . (ع 4) ص ص 151-300.
- زهران، حامد عبد السلام (2003 م) . **الصحة النفسية والعلاج النفسي** . ط4، القاهرة : عالم الكتب.
- السباعي، فضيلة (2010 م) . قلق المستقبل لدى طلبة كلية التربية وعلاقته بالجنس والتخصص الدراسي . **مجلة كلية التربية**، جامعة الموصل، ص ص 11-14 .
- سعود، ناهد شريف (2005 م) . قلق المستقبل وعلاقته بسمتي التقاؤل والتشاؤم . رسالة دكتوراه غير منشورة، جامعة دمشق، سوريا.
- سفيان، نبيل (2004 م) . **المختصر في الشخصية والإرشاد النفسي** . ط (1)، مطابع الدار الهندسية، مصر .
- السويلم، عتاب علي (2013 م) . العلاقة بين أنماط الذكاءات المتعددة ودرجة التوافق مع الحياة الجامعية . بحث ماجستير في التوجيه والإرشاد، جامعة الملك عبد العزيز، كلية الدراسات العليا التربوية ، جدة .
- شقيز، زينب محمود (2005 م) . **مقياس قلق المستقبل** . القاهرة : الأنجلو المصرية.
- شوكت، عواطف محمد (2000 م) . التوافق الدراسي لدى الطالبات المتزوجات وغير المتزوجات وعلاقته ببعدي الكفاية الشخصية والثبات الانفعالي. **مجلة دراسات نفسية**، مجلد 10 (ع 1) ص ص 99-107.
- الصبوة، محمد نجيب (1991 م) . مشكلات طلبة الكليات العلمية والإنسانية. **مركز البحوث والدراسات النفسية** . كلية الآداب، جامعة القاهرة.
- الصرابرة، راجي؛ الحجايا، نائل. (2008 م) . القلق على المستقبل المهني وعلاقته بالرضا عن الدراسة والمستوى الدراسي والمعدل التراكمي والنوع لدى طلبة كلية العلوم التربوية في جامعة الطفيلة التقنية . **مجلة كلية التربية**، جامعة عين شمس -مصر، مجلد 4 (ع 32) ص ص 613 – 646.
- عبد المحسن، مصطفى (2007 م) . فاعلية الإرشاد النفسي في خفض قلق المستقبل المهني لدى طلبة كلية التربية بأسيوط . رسالة ماجستير غير منشورة . جامعة أسيوط.
- العجمي، نجلاء محمد (2004 م) . بناء أداة لقياس قلق المستقبل لدى طلاب وطالبات جامعة الملك سعود. رسالة ماجستير غير منشورة، كلية التربية جامعة الملك سعود .
- عشري، محمود محي الدين (2004 م) . قلق المستقبل وعلاقته ببعض المتغيرات الثقافية . دراسة عبر حضارية مقارنة بين طلاب بعض كليات التربية بمصر وسلطنة عمان المؤتمر السنوي الحادي عشر للإرشاد النفسي بجامعة عين شمس، المجلد الأول . ص 139-178 .
- علام، صلاح الدين محمود (1993) . **الأساليب الإحصائية الاستدلالية البارامترية واللابارامترية في تحليل بيانات البحوث النفسية والتربوية** . دار الفكر العربي
- علي، عبد السلام علي (2008 م) . **دليل تطبيق مقياس التوافق مع الحياة الجامعية (ATCS)** . ط الثانية . القاهرة : مكتبة النهضة المصرية .
- العناني، حنان عبد الحميد (2000 م) . **الصحة النفسية** . الأردن: دار الفكر للطباعة والنشر.
- العنزي، خالد الحميدي (2010 م) . إدارة القبول- الرفض الوالدي والأفكار اللاعقلانية وقلق المستقبل لدى عينة من طالبات جامعة الحدود الشمالية . رسالة دكتوراه غير منشورة، كلية التربية، جامعة أم القرى.

- الغامدي، صالح يحيى (2012 م) . اختبار القدرات العامة وعلاقته بقلق المستقبل في ضوء بعض المتغيرات لدى عينة من طلاب المرحلة الثانوية بالملكة العربية السعودية . **مجلة كلية التربية ببنها**، ع (90)، ج (2)، ص ص 133-134.
- فايد، فريد علي ؛ قاسم، عبد المريد عبد الجابر محمد (2012 م). التوافق مع الحياة الجامعية وعلاقته باحتمالية التسرب الدراسي لدى عينة من طلاب الجامعة . **مجلة الإرشاد النفسي**، مصر، ع 32 ص ص 223-277 .
- فايد، حسين (2003 م) . **الاضطرابات السلوكية تشخيصها أسبابها علاجها** . دار طبية للنشر والتوزيع، القاهرة .
- فرج، محمد ؛ محمود، هويدة (2006 م) . قلق المستقبل وعلاقته ببعض المتغيرات لدى عينة من طلاب كلية التربية جامعة الإسكندرية . رسالة ماجستير غير منشورة، كلية التربية، جامعة الإسكندرية .
- القرشي، محمد بن عابد (2012 م) . الدافع للإنجاز وعلاقته بقلق المستقبل لدى عينة من طلاب جامعة أم القرى . رسالة ماجستير غير منشورة . كلية التربية، جامعة أم القرى، مكة المكرمة .
- كرميان، صلاح حميد (2008 م) . سمات الشخصية وعلاقتها بقلق المستقبل لدى العاملين بصورة مؤقتة من الجالية العراقية باستراليا . رسالة دكتوراه غير منشورة، الدنمارك .
- مجيد، سوسن شاكر (2012 م). التوافق النفسي وخطوات تحقيقه . **الحوار المتمدن**، ع (3740)، ص ص 12-18.
- المحاميد، شاكر عقلة ؛ السفاسفة، محمد إبراهيم (2007 م) . قلق المستقبل المهني لدى طلبة الجامعات الأردنية وعلاقته ببعض المتغيرات . **مجلة العلوم التربوية والنفسية**، كلية التربية - جامعة البحرين، المجلد 8، العدد 3.
- محمد، محمود مندوه (2006 م) . قلق المستقبل وعلاقته ببعض مظاهر التوافق الدراسي لدى طلاب الجامعة . **المجلة المصرية للدراسات النفسية** . جامعة عين شمس . (ع 16) ص ص 219-271.
- محمد، هبة مؤيد (2010 م) . قلق المستقبل عند الشباب وعلاقته ببعض المتغيرات . **مجلة البحوث التربوية النفسية** . جامعة بغداد . ع (27) ص ص 321-377.
- مسعود، سناء (2006 م) . بعض المتغيرات المرتبطة بقلق المستقبل لدى عينة من المراهقين دراسة تشخيصية . رسالة ماجستير غير منشورة، جامعة طنطا، مصر .
- المشيخي، غالب محمد علي (2009 م) . قلق المستقبل وعلاقته بكل من فاعلية الذات ومستوى الطموح لدى عينة من طلاب جامعة الطائف . رسالة دكتوراه غير منشورة، كلية التربية، جامعة أم القرى، مكة المكرمة .
- المصري، نيفين عبد الرحمن (2011 م) . قلق المستقبل وعلاقته بكل من فاعلية الذات ومستوى الطموح . رسالة ماجستير غير منشورة، كلية التربية، جامعة الأزهر بغزة .
- معشي، محمد بن علي مساوي (2012 م) . قلق المستقبل لدى الطالب المعلم وعلاقته ببعض المتغيرات " . دراسات تربوية نفسية . **مجلة كلية التربية بالزقازيق** - مصر، ع 75 ص ص 279-306.
- معوض، محمد عبد التواب (1996 م) . أثر كل من العلاج المعرفي والعلاج النفسي الديني في تخفيف قلق المستقبل لدى عينة من طلبة الجامعة . رسالة دكتوراه غير منشورة، كلية التربية، جامعة طنطا، طنطا .
- النوري، ابتسام سعدون محمد (2012 م) . الإرهاب النفسي لدى طلبة الجامعة وعلاقته بقلق المستقبل . **دراسات عربية في التربية وعلم النفس** - السعودية، ع (32) ص ص 211 - 266 .

2- المراجع الأجنبية:

- [1] Constance, H, (2004). Intergenerational Transmission of Depression test of an interpersonal stress Model in A community sample, **Journal of counseling and Clinical psychology**, 72 (3) pp 511-522.
- [2] Danial, J (2010). The Academic and Social Adjustment of First Generation College Students, Proquestllc, Ed.D. Dissertation, Seton Hall University. 133.AAT.
- [3] Estrada, L., Dupoux, E & Wolman, C. (2006). The Relationship between Locus of Control and Personal-Emotional adjustment and Social Adjustment to College Life in Students with and without Learning Disabilitie. **College Student Journal**, 40 (1), pp 43-54.
- [4] Mahyuddin, R, Abdullah, M, Elias, H, Uli, J (2009). Adjustment Amongst first year students in a Malaysian university . **European Journal of Social Sciences**, 8 (3), pp 496 – 505.
- [5] Morris, J, Costin, D Kalpidou, M (2011). The Relationship Between Face book and the Well-Being of Undergraduate College Students Cyber Psychology, **Behavior, and social networking** 14, (4), pp 183-189.
- [6] Ramos, S. & Nicholas, L. (2007). "Self-efficacy of first generation and non-first generation college students: the relationship with academic performance and college adjustment". **Journal of College Counseling** 10 (1), pp 6-18
- [7] Seligman, A., & Garber, D. (1989). **Children's Reaction To Trauma Hunter house**. New York: Book com.
- [8] Shields, N (2002) Anticipatory socialization, adjustment to university life, and perceived stress: generational and sibling effects, **Social Psychology of Education** (5), pp 365–392.
- [9] Zaleski, Z. (1996). Future Anxiety ; Concept Measurement and preliminary research . **Person individual difference**. vol.21(2) pp 165 -174.

ملحق رقم (1)

مقياس قلق المستقبل
إعداد
(زينب شقير)
أستاذ ورئيس قسم الصحة النفسية
كلية التربية- جامعة طنطا
2005



المملكة العربية السعودية
وزارة التعليم العالي
جامعة الملك عبد العزيز
قسم علم النفس التربوي
التوجيه والإرشاد التربوي

سلمها الله ..

أختي طالبة جامعة الطائف

وبعد :

السلام عليكم ورحمة الله وبركاته

يسعد الباحثة أن تضع بين يديك مقياس قلق المستقبل ومقياس درجة التوافق مع الحياة الجامعية لدراسة بعنوان : (قلق المستقبل وعلاقته بدرجة التوافق مع الحياة الجامعية لدى عينة من طالبات جامعة الطائف) , وتتطلب هذه الدراسة جمع المعلومات الصحيحة , وذلك من خلال مقياسين تضعهما الباحثة بين يديك .
أرجو التكرم بقراءة تعليمات كل مقياس , ثم الإجابة على فقراته بكل صراحة ودقة , والتعامل مع كل عبارة على حدة , وعدم ترك أي فقرة دون إجابة , مع العلم بأنه لا توجد لهذه العبارات إجابات صحيحة وأخرى خاطئة .
وتأكدي أن كل ما تدلين به من معلومات وإجابات ستعامل بسرية تامة , ولن تستخدم إلا لأغراض البحث العلمي .
شاكراً لك كريم تعاونك وحسن استجابتك وتقديرك للبحث العلمي .

الباحثة..

سامية بنت محمد بن حوقان البقمي

البيانات الأولية:

الاسم :
العمر :
التخصص :
الكلية :
كلية التربية والآداب ()
كلية العلوم الطبية التطبيقية ()
الفرقة الدراسية :
الأولى ()
الرابعة ()

التعليمات :

عزيزتي الطالبة...

فيما يأتي مجموعة من العبارات التي تعبّر بوضوح عن رأيك الشخصي اتجاه المستقبل، والمطلوب منك معرفة وجهة نظرك الشخصية بصراحة وأمانة وصدق، وإبراز رأيك ومشاعرك من خلال الإجابة على هذه العبارات بوضع علامة (√) أمام الدرجة أو الإجابة التي تريدينها بنفسك.

تذكّري أنه:

- ❖ لا توجد إجابة صحيحة وأخرى خاطئة.
- ❖ معلوماتك سرية للغاية.
- ❖ لا تتركي عبارة بدون إجابة.
- ❖ المقياس للدراسة وليس للتقييم الشخصي.

شكراً لتعاونك

مقياس قلق المستقبل

م	العبارة	معترض بشدة	معترض أحياناً	بدرجة متوسطة	عادة كثيراً	دائماً تماماً
1	أؤمن بالقضاء والقدر، وأنَّ القدر يحمل أخباراً سارة في المستقبل.					
2	التفوق يدفعني دائماً لمزيد من التفوق وأكافح لتحقيق مستقبل باهر.					
3	تراودني فكرة أنني قد أصبح شخصية عظيمة في المستقبل.					
4	عندي طموحات وأهداف واضحة في الحياة وأعمل لمستقبلي وفقاً لخطة رسمتها لنفسي، وأعرف كيف أحققها؟					
5	الالتزام الديني والأخلاقي والتمسك بمبادئ معينة يضمن للإنسان مستقبلاً آمناً.					
6	الأفضل أن تعمل لدنياك كأنك تعيش أبداً وتعمل لأخرتك كأنك تموت غداً.					
7	أشعر أنَّ الغد (المستقبل) سيكون يوماً ما مشرقاً، وستتحقق آمالي في الحياة					
8	أمل في الحياة كبير، لأن طول العمر يبلغ الأمل.					
9	يخبئ الزمن مفاجآت سارة، ولا يأس في الحياة ولا حياة مع اليأس.					
10	حياتي مملوءة بالحيوية والنشاط والرغبة في تحقيق الآمال.					
11	يتملكني الخوف والقلق والحيرة عندما أفكر في المستقبل وأنه لا حول ولا قوة لي في المستقبل					
12	يدفعني الفشل إلى اليأس وفقدان الأمل في تحقيق مستقبل أفضل.					
13	أنا من الذين يؤمنون بالحظ، ويتحركون على أساسه.					
14	أفضل طريقة للتعاشي مع الحياة هو عدم التفكير في المستقبل، وأترك الحياة تمشي على هواها فهي آخر همي.					
15	تمضي الحياة بشكل مزيف ومحزن ومخيف مما يجعلني أقلق وأخاف من المجهول.					
16	أشعر بالفراغ واليأس وفقدان الأمل في الحياة وأنه من الصعب إمكانية تحسينها مستقبلاً.					
17	أشعر بالانزعاج لاحتمال وقوع كارثة قريباً بسبب كثرة الحوادث هذه الأيام.					
18	أشعر بتغيرات مستمرة في مظهري (شكلي) تجعلني أخاف أن أكون غير جذابة أمام الآخرين مستقبلاً. (لا يتقبلني الآخرون)					
19	يبتابني شعور بالخوف والوهم من إصابتي بمرض خطير أو حادث في أي وقت.					
20	الحياة مملوءة بالعنف والإجرام تجعل الفرد يتوقع الخطر لنفسه في أي وقت.					
21	كثرة البطالة في المجتمع تهدد بحياة صعبة وسوء التوافق الأسري وعدم استقرار الحياة الزوجية مستقبلاً.					
22	غلاء المعيشة وانخفاض الدخل وانخفاض العائد المادي يقلقني على مستقبلي.					
23	المستقبل غامض ومبهم (مجهول) لدرجة تجعل (من الصعب) ومن الصعب أن يرسم الشخص أي خطة للأمور الهامة في مستقبله.					
24	ضغوط الحياة تجعل من الصعب أن أظل محتفظة بأملي في الحياة و أن أتفاعل بأنني سأكون في أحسن حال.					
25	أشعر بالقلق الشديد عندما أتخيل إصابتي في حادثٍ قد يحدث لي بالفعل أو يحدث لشخص بهمني.					
26	يغلب عليّ التفكير بالموت في أقرب وقت خاصة عندما أصاب بمرض أو يصاب أحد أقاربي.					
27	أنا غير راضية عن مستوى معيشتي بوجه عام مما يشعرني بالفشل في المستقبل.					
28	أشعر أنَّ الحياة عقيمة بلا هدف ولا معنى ولا مستقبل واضح.					

ملحق (2)

مقياس التوافق مع الحياة الجامعية

ATCS

بوهدن سيرك

روبرت بيكر

ROBERT BAKER & BOHAON SIRYK

تعريب وإعداد

علي عبد السلام علي

أستاذ ورئيس قسم علم النفس كلية الآداب – جامعة بنها

2008



البيانات الأولية:

الاسم : العمر : التخصص :

الكلية :

كلية التربية والآداب () كلية العلوم الطبية التطبيقية ()

الفرقة الدراسية :

الأولى () الرابعة ()

التعليمات :

عزيزتي الطالبة

يهتم هذا المقياس بقياس الجوانب الأكاديمية، والاجتماعية، والعاطفية / الشخصية، والالتزام بتحقيق الأهداف المستقبلية لطالبات وطالبات الجامعة، للوصول إلى تحقيق أقصى درجات التوافق مع الحياة الجامعية .

ولكي نصل بقياس دقيق لتحقيق التوافق مع الحياة الجامعية، يجب الإجابة عن كلّ سؤال بأمانة ودقة، ويجب أن تعرفي أنّه لا توجد إجابات صحيحة، وأخرى خاطئة.

وستجدين أمام كلّ سؤال الإجابات الآتية : تنطبق تماماً، وتنطبق إلى حد ما، ولا تنطبق فإذا كانت إجابتك "تنطبق تماماً" فضعي علامة (√) أمام العبارة التي تنطبق عليك تماماً وإذا كانت العبارة لا تنطبق عليك فضعي علامة (√) أمام العمود الخاص بذلك . وهكذا، ولا يوجد زمن محدد للإجابة، ولكن حاولي أن تجيبي بسرعة . أجبي بصراحة ولا تستشري أي شخص آخر أثناء إجابتك .

مقياس درجة التوافق مع الحياة الجامعية

م	العبارة	تتطبق تماماً	تتطبق إلى حد ما	لا تتطبق
1	أشعر بالراحة عندما أكون متواجدة بالكلية.			
2	أشعر أحياناً بالتوتر، واضطراب المزاج داخل الكلية.			
3	أواظب على حضور المحاضرات بانتظام.			
4	أقابل كثيراً من الطالبات، وأسعى لعمل صداقات معهن.			
5	عرفت لماذا أتواجد بالكلية، وماذا أريد منها.			
6	أشعر بعدم التوافق في عمل علاقات مع الجنس الآخر.			
7	أنا متوافقة مع الحياة الجامعية.			
8	أشعر بعدم الاستقرار العاطفي في علاقتي مع الجنس الآخر.			
9	أحاول الاعتماد على نفسي في حل المشكلات التي تواجهني داخل الجامعة.			
10	أنا مقتنعة الآن بقرار اختياري للكلية التي أدرس فيها.			
11	أحاول تحقيق أهدافي من خلال تفوقي في دراستي الجامعية.			
12	أنا غير راضية عن مستوى تحصيلي الدراسي.			
13	أهدافي وأمالي في الدراسة الجامعية تتسم بالوضوح.			
14	أشعر بفقدان الدافعية كي أستمّر في الدراسة الجامعية في الفترة الأخيرة.			
15	الحصول على الشهادة الجامعية هو أهم شيء بالنسبة لي.			
16	أنا راضية عن مقررات الدراسة الجامعية.			
17	أستمتع بتدوين المحاضرات الجامعية.			
18	أعتمد على بعض الزميلات في حلّ بعض المشكلات العاطفية مع الجنس الآخر.			
19	أنا مقتنعة بممارسة الأنشطة الرياضية والثقافية والترفيهية داخل الجامعة.			
20	أنا مقتنعة بدور مركز الخدمات النفسية داخل الجامعة في توجيه وإرشاد طلاب الجامعة.			
21	أواظب على زيارتي للمكتبة الجامعية لزيادة معلوماتي.			
22	أشعر أحياناً بالتردد في اختياري للتخصص الدراسي.			
23	أشعر أحياناً بمشكلات في النوم عند التفكير في مستقبلتي بعد انتهاء الدراسة الجامعية.			
24	أجد صعوبة في قضاء وقت فراغي داخل الجامعة.			
25	أشارك في الندوات والمؤتمرات العلمية التي تعقدها الجامعة.			
26	أحافظ على تدوين مذكراتي عن الحياة الجامعية.			
27	أشعر بعدم التركيز في ترتيب أفكاري.			
28	أجد متاعب كثيرة في عمل الواجبات الدراسية في المنزل.			
29	أشعر بالاختلاف عن بعض زميلات الدراسة في بعض الأفكار والأفعال التي يقمن بها.			
30	تواجهني بعض الصعوبات في تحصيل بعض المقررات الدراسية.			
31	أحب المقررات الدراسية ذات الطبيعة التطبيقية.			
32	أحاول تأهيل نفسي للعمل الذي أرغب في مزاولته بعد التخرج.			
33	ألتزم بكل إرشادات وتوجيهات أساتذة الجامعة.			
34	أتمنى الاستمرار في استكمال دراستي العليا بعد تخرجي من الجامعة.			
35	تربطني علاقات ودية مع بعض أعضاء هيئة التدريس بالجامعة.			
36	أختلف مع بعض زميلات الدراسة في بعض القضايا العلمية.			

ملحق رقم (3)

خطاب موجّه من جامعة الملك عبد العزيز إلى عميد جامعة الطائف بفرع تربية.

الرقم: التاريخ: المرفق:		المملكة العربية السعودية وزارة التعليم العالي جامعة الملك عبد العزيز شطر الطالبات		
نموذج تدريب طالبات للجهات المصدرة				
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>اسم الجهة: : جامعة الطائف فرع محافظة تربة</p> <p>معاينة / معيد جامعة الطائف فرع محافظة تربة</p> <p>السلام عليكم ورحمة الله وبركاته ...</p> </div> <div style="width: 45%; text-align: right;"> <p>بسم الله</p> </div> </div>				
<p>انطلاقاً من أهمية التعاون المتبادل بين الجامعة وبين مختلف قطاعات المجتمع ولحاجة بعض المواد لدراسات تطبيقية تتم عن طريق الزيارات الميدانية أو التدريب العملي للجهات التابعة لكم، فإننا نأمل من سعادتكم تسهيل قيام الطالبة باستكمال متطلبات موادها العلمية وفقاً للمعلومات الموضحة أدناه.</p>				
<p>الكلية / برنامج الدراسات العليا التربوية القسم العلمي / علم النفس التربوي _ ماجستير التوجيه والإرشاد التربوي</p> <p>تاريخ الزيارة: ١٤٣٥ / ٤ / ٥ هـ للفصل الدراسي: الأول <input checked="" type="checkbox"/> الثاني <input type="checkbox"/> صيفي</p> <p>الهدف من الزيارة: تسهيل مهامها العلمية في تطبيق موضوع البحث وذلك خلال الفصل الدراسي للعام (١٤٣٤ / ١٤٣٥ هـ)</p>				
الترتيب	أسماء الطالبات	الرقم الجامعي	رقم الجوال	ملاحظات
1	سامية محمد حوقان البقمي	١٣٠١٦١١	٠٥٠٤٥٤٤٣١٧	موضوع البحث للطالبة: قلق المستقبل وعلاقته بدرجة التوافق مع الحياة الجامعية لدى عينة من طالبات جامعة الطائف فرع محافظة تربة
العدد الكلي:		طالبة		
<div style="display: flex; justify-content: space-between; align-items: flex-end;"> <div style="width: 45%;"> <p>اسم المصدرة: د. / التوقيع: وكالة برنامج الدراسات العليا التربوية د. / التوقيع:</p> </div> <div style="width: 45%; text-align: right;"> <p>هاجرين ومقدريين معاونه ...</p> </div> </div>				



ملحق رقم (4)

خطاب موجه من وكالة الدراسات الجامعية لجامعة الطائف بفرع تربة إلى أعضاء الهيئة التدريسية والإدارية بالجامعة لتسهيل مهمة الباحثة .

بسم الله الرحمن الرحيم

الملك العربية السعودية
وزارة التعليم العالي
جامعة الطائف

الرقم :
التاريخ : ١٤٣٥/٤/٢٠
المرقعات :
الموضوع :

جامعة الطائف
TAIF UNIVERSITY
١٤٣٥ هـ - ٢٠١٣ م

سعادة أعضاء هيئة التدريس بالفرع والكادر الإداري

حفظه الله

السلام عليكم ورحمة الله وبركاته

نأمل التعاون مع المعلمة / سامية محمد حوقان بتطبيق مقاييس الدراسة وتسهيل مهمتها
للاطلاع وإكمال اللازم ..
ولساعدتكم جزيل الشكر ،،

وكالة الدراسات الجامعية بفرع الجامعة بتربة

د. فاطمة الراجحي

١٤٣٥/٤/٢٠



High Pressure Processing- Changes in Quality Characteristic of Various Food Material Processed Under High Pressure Technology

Ravi Shankar

Department of Food Process Engineering, Vaugh School of Agriculture Engineering and Technology,
Sam HigginBottom Institute of Agriculture, Technology and Sciences-Deemed University,
P.O Naini, Allahabad, U.P-211007, India

ABSTRACT: Consumers demand for quality of food has triggered the need for the development of a number of non-thermal approaches to food processing, of which high-pressure technology has proven to be very valuable. This review aims to identify the opportunities and challenges associated with this technology. In addition to discussing the effects of high pressure on food components, this review covers the combined effects of high pressure processing with: gamma irradiation, alternating current, ultrasound, and carbon dioxide or anti-microbial treatment. Further, the applications of this technology in various sectors— fruits and vegetables, dairy, and meat processing—have been dealt with extensively. The integration of high-pressure with other matured processing operations such as blanching, dehydration, osmotic dehydration, rehydration, frying, freezing / thawing and solid-liquid extraction has been shown to open up new processing options. The key challenges identified include: heat transfer problems and resulting non-uniformity in processing, obtaining reliable and reproducible data for process validation, lack of detailed knowledge about the interaction between high pressure, and a number of food constituents, packaging and statutory issues. The aim of this review is the different aspects and potential application of HPT and critically examines HPT related studies. Different types of food product (fruits and vegetables product, Dairy product, Meat product, Starch product etc.) are preserved and maintained the nutritional qualities for longer time.

KEYWORDS: HPT, HPP, Isostatic, Rheology, Sterilization, Pasteurization, Preservation, Operating Cost.

1 INTRODUCTION

Technology Demand for safe food available throughout the year has been increasing throughout the world with busy schedule and increasing consumer's knowledge about the products, so the food technologist has to work on technologies which can satisfy the consumer's demand of safe, fresh, varieties and less expensive foods. Consumers need to make aware of the safety of the technology used for preserved food. The food technologist need to work in the area for the adaptation of the best technology available with can preserve original quality of food as fresh procured and with minimum operating cost for those technological treatments.

"High pressure kills microorganisms and preserves food" was discovered way back in 1899 and has been used with success in chemical, ceramic, carbon allotropy, steel/alloy, composite materials and plastic industries for decades, it was only in late 1980's that its commercial benefits became available to the food processing industries. High pressure processing (HPP) is similar in concept to cold isostatic pressing of metals and ceramics, except that it demands much higher pressures, faster cycling, high capacity, and sanitation (Zimmerman and Bergman, 1993; Mertens and Deplace, 1993). Hite (1899) investigated the application of high pressure as a means of preserving milk, and later extended the study to preserve fruits and vegetables (Hite, Giddings, and Weakly, 1914). It then took almost eighty years for Japan to re-discover the application of high-pressure in food processing. The use of this technology has come about so quickly that it took only three years for two Japanese companies to launch products, which were processed using this technology. The ability of high pressure to inactivate microorganisms and spoilage catalyzing enzymes, whilst retaining other quality attributes, has encouraged Japanese and American food companies to introduce high pressure processed foods in the market (Mermelstein, 1997; Hendrickx, Ludikhuyze, Broeck, and Weemaes, 1998). The first high pressure processed foods were introduced to the Japanese market in 1990 by Meidi-ya, who have been marketing a line of jams, jellies, and sauces packaged and processed without application

of heat (Thakur and Nelson, 1998). Other products include fruit preparations, fruit juices, rice cakes, and raw squid in Japan; fruit juices, especially apple and orange juice, in France and Portugal; and guacamole and oysters in the USA (Hugas, Garcia, and Monfort, 2002). In addition to food preservation, high-pressure treatment can result in food products acquiring novel structure and texture, and hence can be used to develop new products (Hayashi, 1990) or increase the functionality of certain ingredients. Depending on the operating parameters and the scale of operation, the cost of high pressure treatment is typically around US\$ 0.05–0.5 per liter or kilogram, the lower value being comparable to the cost of thermal processing (Thakur and Nelson, 1998; Balasubramaniam, 2003).

The non-availability of suitable equipment encumbered early applications of high pressure. However, recent progress in equipment design has ensured worldwide recognition of the potential for such a technology in food processing (Gould, 1995; Galazka and Ledward, 1995; Balci and Wilbey, 1999). Today, high-pressure technology is acknowledged to have the promise of producing a very wide range of products, whilst simultaneously showing potential for creating a new generation of value added foods. In general, high-pressure technology can supplement conventional thermal processing for reducing microbial load, or substitute the use of chemical preservatives (Rastogi, Subramanian, and Raghavarao, 1994).

Over the past two decades, this technology has attracted considerable research attention, mainly relating to:

- i) the extension of keeping quality (Cheftel, 1995; Farkas and Hoover, 2001),
- ii) changing the physical and functional properties of food systems (Cheftel, 1992), and
- iii) exploiting the anomalous phase transitions of water under extreme pressures, e.g. lowering of freezing point with increasing pressures (Kalichevsky, Knorr, and Lillford, 1995; Knorr, Schlueter, and Heinz, 1998).

The key advantages of this technology can be summarized as follows:

1. it enables food processing at ambient temperature or even lower temperatures;
2. it enables instant transmittance of pressure throughout the system, irrespective of size and geometry, thereby making size reduction optional, which can be a great advantage;
3. it causes microbial death whilst virtually eliminating heat damage and the use of chemical preservatives/additives, thereby leading to improvements in the overall quality of foods; and
4. it can be used to create ingredients with novel functional properties. The effect of high pressure on microorganisms and proteins/ enzymes was observed to be similar to that of high temperature.

As mentioned above, high pressure processing enables transmittance of pressure rapidly and uniformly throughout the food. Consequently, the problems of spatial variations in preservation treatments associated with heat, microwave, or radiation penetration are not evident in pressure-processed products.

The application of high pressure increases the temperature of the liquid component of the food by approximately 3°C per 100 MPa. If the food contains a significant amount of fat, such as butter or cream, the temperature rise is greater (8–9°C/100 MPa) (Rasanayagam, Balasubramaniam, Ting, Sizer, Bush, and Anderson, 2003). Foods cool down to their original temperature on decompression if no heat is lost to (or gained from) the walls of the pressure vessel during the holding stage.

The temperature distribution during the pressure-holding period can change depending on heat transfer across the walls of the pressure vessel, which must be held at the desired temperature for achieving truly isothermal conditions. In the case of some proteins, a gel is formed when the rate of compression is slow, whereas a precipitate is formed when the rate is fast. High pressure can cause structural changes in structurally fragile foods containing entrapped air such as strawberries or lettuce. Cell deformation and cell damage can result in softening and cell serum loss. Compression may also shift the pH depending on the imposed pressure. Heremans (1995) indicated a lowering of pH in apple juice by 0.2 units per 100 MPa increase in pressure. In combined thermal and pressure treatment processes, Meyer (2000) proposed that the heat of compression could be used effectively, since the temperature of the product can be raised from 70–90°C to 105–120°C by a compression to 700 MPa, and brought back to the initial temperature by decompression.

As a thermodynamic parameter, pressure has far-reaching effects on the conformation of macromolecules, the transition temperature of lipids and water, and a number of chemical reactions (Cheftel, 1992; Tauscher, 1995). Phenomena that are accompanied by a decrease in volume are enhanced by pressure, and vice-versa (principle of Le Chatelier). Thus, under pressure, reaction equilibria are shifted towards the most compact state, and the reaction rate constant is increased or decreased, depending on whether the “activation volume” of the reaction (i.e. volume of the activation complex less volume of reactants) is negative or positive. It is likely that pressure also inhibits the availability of the activation energy required for some reactions, by affecting some other energy releasing enzymatic reactions (Farr, 1990). The compression energy of 1 litre of water at 400 MPa is 19.2 kJ, as compared to 20.9 kJ for heating 1 litre of water from 20 to 25°C. The low energy levels

involved in pressure processing may explain why covalent bonds of food constituents are usually less affected than weak interactions. Pressure can influence most biochemical reactions, since they often involve change in volume. High pressure controls certain enzymatic reactions. The effect of high pressure on protein/enzyme is reversible unlike temperature, in the range 100–400 MPa and is probably due to conformational changes and sub-unit dissociation and association process (Morild, 1981).

For both the pasteurization and sterilization processes, a combined treatment of high pressure and temperature are frequently considered to be most appropriate (Farr, 1990; Patterson, Quinn, Simpson, and Gilmour, 1995). Vegetative cells, including yeast and moulds, are pressure sensitive, i.e. they can be inactivated by pressures of ~300–600 MPa (Knorr, 1995; Patterson, Quinn, Simpson, and Gilmour, 1995). At high pressures, microbial death is considered to be due to permeabilization of cell membrane.

For instance, it was observed that in the case of *Saccharomyces cerevasia*, at pressures of about 400 MPa, the structure and cytoplasmic organelles were grossly deformed and large quantities of intracellular material leaked out, while at 500 MPa, the nucleus could no longer be recognized, and a loss of intracellular material was almost complete (Farr, 1990). Changes that are induced in the cell morphology of the microorganisms are reversible at low pressures, but irreversible at higher pressures where microbial death occurs due to permeabilization of the cell membrane. An increase in process temperature above ambient temperature, and to a lesser extent, a decrease below ambient temperature, increases the inactivation rates of microorganisms during high pressure processing. Temperatures in the range 45 to 50°C appear to increase the rate of inactivation of pathogens and spoilage microorganisms. Preservation of acid foods (pH≤4.6) is, therefore, the most obvious application of HPP as such. Moreover, pasteurization can be performed even under chilled conditions for heat sensitive products. Low temperature processing can help to retain nutritional quality and functionality of raw materials treated and could allow maintenance of low temperature during post harvest treatment, processing, storage, transportation, and distribution periods of the life cycle of the food system (Knorr, 1995).

Bacterial spores are highly pressure resistant, since pressures exceeding 1200 MPa may be needed for their inactivation (Knorr, 1995). The initiation of germination or inhibition of germinated bacterial spores and inactivation of piezo-resistive microorganisms can be achieved in combination with moderate heating or other pretreatments such as ultrasound. Process temperature in the range 90–121°C in conjunction with pressures of 500-800 MPa have been used to inactivate spores forming bacteria such as *Clostridium botulinum*. Thus, sterilization of low-acid foods (pH > 4.6), will most probably rely on a combination of high pressure and other forms of relatively mild treatments.

High-pressure application leads to the effective reduction of the activity of food quality related enzymes (oxidases), which ensures high quality and shelf stable products. Sometimes, food constituents offer piezo-resistance to enzymes. Further, high pressure affects only non-covalent bonds (hydrogen, ionic, and hydrophobic bonds), causes unfolding of protein chains, and has little effect on chemical constituents associated with desirable food qualities such as flavor, color, or nutritional content. Thus, in contrast to thermal processing, the application of high-pressure causes negligible impairment of nutritional values, taste, color flavor, or vitamin content (Hayashi, 1990). Small molecules such as amino acids, vitamins, and flavor compounds remain unaffected by high pressure, while the structure of the large molecules such as proteins, enzymes, polysaccharides, and nucleic acid may be altered (Balci and Wilbey, 1999). High pressure reduces the rate of browning reaction (Maillard reaction). It consists of two reactions, condensation reaction of amino compounds with carbonyl compounds, and successive browning reactions including melanoidin formation and polymerization processes. The condensation reaction shows no acceleration by high pressure (5–50 MPa at 50°C), because it suppresses the generation of stable free radicals derived from melanoidin, which are responsible for the browning reaction (Tamaoka, Itoh, and Hayashi, 1991). Gels induced by high pressure are found to be more glossy and transparent because of rearrangement of water molecules surrounding amino acid residues in a denatured state (Okamoto, Kawamura, and Hayashi, 1990). The capability and limitations of HPP have been extensively reviewed (Thakur and Nelson, 1998; Smelt, 1998; Cheftal, 1995; Knorr, 1995; Farr, 1990; Tiwari, Jayas, and Holley, 1999; Cheftel, Levy, and Dumay, 2000; Messens, Van Camp, and Huyghebaert, 1997; Ontero and Sanz, 2000; Hugas, Garriga, and Monfort, 2002; Lakshmanan, Piggott, and Paterson, 2003; Balasubramaniam, 2003; Matser, Krebbers, Berg, and Bartels, 2004; Hogan, Kelly, and Sun, 2005; Mor-Mur and Yuste, 2005).

Many of the early reviews primarily focused on the microbial efficacy of high-pressure processing. This review comprehensively covers the different types of products processed by high pressure technology alone or in combination with the other processes. It also discusses the effect of high pressure on food constituents such as enzymes and proteins. The applications of this technology in fruits and vegetable, dairy and animal product processing industries are covered. The effects of combining high-pressure treatment with other processing methods such as gamma-irradiation, alternating current,

ultrasound, carbon dioxide, and anti-microbial peptides have also been described. Special emphasis has been given to opportunities and challenges in high pressure processing of foods, which can potentially be explored and exploited.

Consumers demand high quality and convenient products with natural flavor and taste, and greatly appreciate the fresh appearance of minimally processed food. Besides, they look for safe and natural products without additives such as preservatives and humectants. In order to harmonize or blend all these demands without compromising the safety of the products, it is necessary to implement newer preservation technologies in the food industry.

2 HIGH PRESSURE PROCESSING

2.1 BASIC HPP PRINCIPLES

Various physical and chemical changes result from the application of pressure. Generally, physical compression during pressure treatment results in a volume reduction and an increase in temperature and energy (Heremans, 2003). In predicting the effect of HPP on foods, it is necessary to consider the net combined pressure-temperature effect of the process.

The following principles govern the behavior of foods under pressure.

- **Le Chatelier's principle.** Any phenomenon (phase transition, change in molecular configuration, chemical reaction) accompanied by a decrease in volume is enhanced by pressure. Accordingly, pressure shifts the system to that of lowest volume (Farkas and Hoover, 2000).
- **Principle of microscopic ordering.** At constant temperature, an increase in pressure increases the degree of ordering of molecules of a given substance. Therefore, pressure and temperature exert antagonistic forces on molecular structure and chemical reactions (Balny and Masson, 1993).
- **Isostatic principle.** Pressure is uniformly distributed throughout the entire sample, whether in direct contact with the pressurizing medium or insulated from it in a flexible container. Thus, the process time is independent of sample size and shape, assuming uniform thermal distribution within the sample. If a food product contains sufficient moisture, pressure will not damage the product at the macroscopic level as long as the pressure is applied uniformly in all directions. For example, a grape can be easily crushed if pressure is applied to it by placing it between two fingers and squeezing along one axis. In contrast, if the grape is exposed to a uniform pressure by submerging it in water inside a sealed flexible bottle and squeezing, the grape retains its shape no matter how hard the bottle is squeezed. In this case, the pressure transmitted from the bottle wall through the water is applied uniformly around the fruit. Similarly, pressure will not damage most foods processed by high pressure, providing the food does not have a porous structure containing air voids. Air pockets will collapse under pressure due to differences between the compressibility of air and water, and unless the food is perfectly elastic and consists of closed-cell foam from which air cannot escape, the food will not be restored to its original size and shape. As a result, foods like strawberries are crushed by HPP, but an air-filled balloon does not burst.

2.2 HIGH-PRESSURE EQUIPMENT

Although the principles of high pressure processing for microbial inactivation have been known since the late 1800s (Hite, 1899), it is only relatively recent developments in mechanical engineering that have permitted large high-pressure vessels to be constructed at reasonable cost with sufficient durability to withstand thousands of pressure cycles without failure. High-pressure processing systems were initially developed in the chemical and material process industries for applications such as making artificial diamonds and sintered materials from powders. It is only during the past two decades that the food industry has begun using pressure treatment for food preservation. HPP is primarily practiced as a batch process where pre-packaged food products are treated in a chamber surrounded by water or another pressure-transmitting fluid. Semi-continuous systems have been developed for pumpable foods where the product is compressed without a container and subsequently packaged "clean" or aseptically. The primary components of an HPP system include a pressure vessel; closure(s) for sealing the vessel; a device for holding the closure(s) in place while the vessel is under pressure (e.g., yoke); high-pressure intensifier pump(s); a system for controlling and monitoring the pressure and (optionally) temperature; and a product-handling system for transferring product to and from the pressure vessel. Normally, perforated baskets are used to insert and remove pre-packaged food products from the pressure vessels. Systems also have provisions for filtering and reusing the compression fluid (usually water or a food-grade solution).

Commercial batch vessels have internal volumes ranging from 30 to more than 600 liters. Avure Technologies, NC Hyperbaric, and Uhde are major suppliers of commercial-scale pressure equipment. Both horizontal and vertical pressure

vessel configurations are available. Commercial-scale, highpressure processing systems cost approximately \$500,000 to \$2.5 million, depending on equipment capacity and extent of automation. Currently, HPP treatment costs are quoted as ranging from 4–10 cents/lb, including operating cost and depreciation, and are not “orders of magnitude” higher than thermal processing—as is often thought (Sàiz et al., 2008). As demand for HPP equipment grows, innovation is expected to further reduce capital and operating costs.

A typical HPP process uses food products packaged in a high-barrier, flexible pouch or a plastic container. The packages are loaded into the high-pressure chamber. The vessel is sealed and the vessel is filled with a pressure transmitting fluid (normally water) and pressurized by the use of a high-pressure pump, which injects additional quantities of fluid. The packages of food, surrounded by the pressure-transmitting fluid, are subjected to the same pressure as exists in the vessel itself. After holding the product for the desired time at the target pressure, the vessel is decompressed by releasing the pressure-transmitting fluid (Farkas and Hoover, 2000). For most applications, products are held for 3–5 min at 600 MPa. Approximately 5–6 cycles/hr are possible, allowing time for compression, holding, decompression, loading, and unloading. Slightly higher cycle rates may be possible using fully automated loading and unloading systems. After pressure treatment, the processed product is removed from the vessel and stored/distributed in a conventional manner.

Liquid foods can be processed in a batch or semi-continuous mode. In the batch mode, the liquid product is pre-packaged and pressure-treated as described above for packaged foods. Semicontinuous operation requires two or more pressure vessels, each equipped with a free-floating piston that allows each vessel to be divided into two chambers. One chamber is used for the liquid food; the other for the pressure-transmitting fluid. The basic operation involves filling one chamber with the liquid food to be treated. The fill valve is closed and then pressure-transmitting fluid is pumped into the second chamber of the vessel on the opposite side of the floating piston. Pressurization of the fluid in this second chamber results in compression of the liquid food in the first. After an appropriate holding time, the pressure is released from the second chamber. The product discharge valve is opened to discharge the contents of the first chamber, and a low-pressure pump injects pressure-transmitting fluid into the second chamber, which pushes on the piston and expels the contents of the product chamber through the discharge valve. The treated liquid food is directed to a sterile tank from which sterile containers can be filled aseptically. Typically, three pressure vessels are used to create a semi-continuous system capable of delivering a continuous product output. This is accomplished by operating the three vessels such that one is loading, one is compressing, and one is discharging at any point in time (Farkas and Hoover, 2000).

The U.S. food industry has gained about 18 years of experience with commercial scale, high-pressure equipment since the introduction of high pressure pasteurization systems during the 1990s. In response to industrial demand for higher volume and throughput, high pressure equipment vendors have focused on improving equipment productivity. Developments have included a doubling of pressure vessel volumes, automated systems for package and vessel loading, and higher horsepower intensifiers to speed up the compression process. Tandem machines (Sàiz et al., 2008), where multiple vessels are serviced by a common bank of high-pressure pumps, have also become available. By sequencing the compression cycles of multiple vessels, it is possible to increase throughput and reduce capital costs by shortening the compression time (through use of multiple pumps) and utilizing the same pumps to pressurize the other vessels during a period of time when the pumps would normally be idle in a single vessel system. With two or more pressure vessels operating under typical food processing conditions, a throughput of approximately 20 million lb/yr is achievable.

2.3 COMMERCIAL APPLICATIONS

High-pressure processing provides a unique opportunity for food processors to develop a new generation of value-added food products having superior quality to those produced conventionally. Strawberry, apple, and kiwi jams represented the first wave of pressure-treated commercial products introduced into the Japanese market in 1990. Avocado based products, especially guacamole, were subsequently commercialized in the United States. Fresherized Foods (formerly Avomex) began the first industrial production of guacamole in North America in 1997. A decade later, by 2007, approximately 120 industrial HPP installations were in use worldwide for commercial scale food production (Sàiz et al., 2008). More than 80% of the equipment was installed after 2000, indicating an accelerated trend in HPP use. According to some industry estimates, high pressure food pasteurization currently represents a \$2 billion market (Hewson, 2008). North America (U.S., Canada, and Mexico), Europe (Spain, Italy, Portugal, France, UK, and Germany), Australia, and Asia (Japan, China, and S. Korea) lead the commercialization of high pressure technology. The total production of pressure-treated food products is steadily growing.

In 2008, it is estimated that 200,000 metric tons/yr (about 450 million lb/year) of pressure-treated products will be commercially available worldwide (Samson, 2008). The novel nature of HPP technology and high equipment costs have been barriers to commercialization, but increased consumer demand for fresher tasting foods containing fewer preservatives is

driving increased usage. HPP can preserve food products without heat or chemical preservatives, and its ability to ensure safety and significantly extend refrigerated shelf life has opened new market opportunities particularly in the area of “natural” preservative-free meat products. Hormel Foods, Kraft Foods, Perdue, Foster Farms, and Wellshire Farms are examples of meat processors that have successfully utilized the technology for a variety of ready-to eat, minimally processed meat products (Samson, 2008). Several seafood processors such as Motivati Seafoods have also employed HPP to improve food safety and shelf life of shellfish with the added benefit of facilitating the removal of flesh from the shell. Other market segments employing pressure treatment include juice, beverage, and vegetable products. The ability of HPP to deliver a “clean” ingredient statement, fresher flavor, and better nutrition provide a unique point of difference for producers. High pressure processing is a paradigm-shifting technology for the food industry that is on-trend with consumer interests. Its use will likely grow as cost declines and food manufacturers identify new applications where HPP can deliver product quality improvements that consumers appreciate and will pay for.

3 HIGH PRESSURE EFFECT ON ENZYMES AND PROTEINS

3.1 ENZYMES

Enzymes are a special class of proteins in which biological activity arises from active sites, brought together by a three-dimensional configuration of molecule. The changes in active site or protein denaturation can lead to loss of activity, or changes the functionality of the enzymes (Tsou, 1986). In addition to conformational changes, enzyme activity can be influenced by pressure-induced decompartmentalization (Butz, Koller, Tauscher, and Wolf, 1994; Gomes and Ledward, 1996). Pressure induced damage of membranes facilitates enzymesubstrate contact. The resulting reaction can either be accelerated or retarded by pressure (Butz, Koller, Tauscher, and Wolf, 1994; Gomes and Ledward, 1996; Morild, 1981). Hendrickx, Ludikhuyze, Broeck, and Weemaes (1998) and Ludikhuyze, Van

Loey, and Indrawati et al. (2003) reviewed the combined effect of pressure and temperature on enzymes related to the ity of fruits and vegetables, which comprises of kinetic information as well as process engineering aspects.

3.2 PROTEINS

High pressure denatures protein depending on the protein type, processing conditions, and the applied pressure. During the process of denaturation, the proteins may dissolve or precipitate on the application of high pressure. These changes are generally reversible in the pressure range 100–300 MPa and irreversible for the pressures higher than 300 MPa. Denaturation may be due to the destruction of hydrophobic and ion pair bonds, and unfolding of molecules. At higher pressure, oligomeric proteins tend to dissociate into subunits becoming vulnerable to proteolysis. Monomeric proteins do not show any changes in proteolysis with increase in pressure (Thakur and Nelson, 1998). High-pressure effects on proteins are related to the rupture on non-covalent interactions within protein molecules, and to the subsequent reformation of intra and inter molecular bonds within or between the molecules. Different types of interactions contribute to the secondary, tertiary, and quaternary structure of proteins. The quaternary structure is mainly held by hydrophobic interactions that are very sensitive to pressure. Significant changes in the tertiary structure are observed beyond 200 MPa. However, a reversible unfolding of small proteins such as ribonuclease A occurs at higher pressures (400 to 800 MPa), showing that the volume and compressibility changes during denaturation are not completely dominated by the hydrophobic effect. Denaturation is a complex process involving intermediate forms leading to multiple denatured products. Secondary structure changes take place at a very high pressure above 700 MPa, leading to irreversible denaturation (Balny and Masson, 1993). When the pressure increases to about 100 MPa, the denaturation temperature of the protein increases, whereas at higher pressures, the temperature of denaturation usually decreases. This results in the elliptical phase diagram of native denatured protein shown in Fig. 1. A practical consequence is that under elevated pressures, proteins denature usually at room temperature than at higher temperatures. The phase diagram also specifies the pressure-temperature range in which the protein maintains its native structure. Zone III specifies that at high temperatures, a rise in denaturation temperature is found with increasing pressure. Zone II indicates that below the maximum transition temperature, protein denaturation occurs at the lower temperatures under higher pressures. Zone III shows that below the temperature corresponding to the maximum transition pressure, protein denaturation occurs at lower pressures using lower temperatures (Messens, Van Camp, and Huyghebaert, 1997).

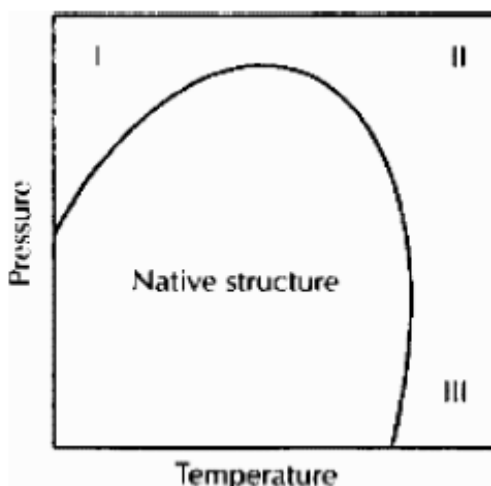


Fig. 1. General scheme for pressure-temperature phase diagram of proteins.(from Messens, Van Camp and Huyghebaert, 1997).

4 COMBINED EFFECT OF HIGH PRESSURE TREATMENT AND OTHER NON-THERMAL PROCESSING METHODS

Many researchers have combined the use of high pressure with other non-thermal operations in order to explore the possibility of synergy between processes. Such attempts are reviewed in this section.

4.1 GAMMA IRRADIATION

Crawford, Murano, Olson, and Shenoy (1996) studied the combined effect of high pressure and gamma-irradiation for inactivating *Clostridium sporogenes* spores in chicken breast. Application of high pressure reduced the radiation dose required to produce chicken meat with extended shelf life. The application of high pressure (600 MPa for 20 min at 80°C) reduced the irradiation doses required for one log reduction of *Clostridium sporogenes* from 4.2 kGy to 2.0 kGy. Mainville, Montpetit, Durand, and Farnworth (2001) studied the combined effect of irradiation and high pressure on microflora and microorganisms of kefir. The irradiation treatment of kefir at 5 kGy and highpressure treatment (400 MPa for 5 or 30 min) deactivated the bacteria and yeast in kefir, while leaving the proteins and lipids unchanged.

4.2 ALTERNATING CURRENT

The exposure of microbial cells and spores to an alternating current (50 Hz) resulted in the release of intracellular materials causing loss or denaturation of cellular components responsible for the normal functioning of the cell. The lethal damage to the microorganisms enhanced when the organisms are exposed to an alternating current before and after the pressure treatment. High-pressure treatment at 300 MPa for 10 min for *Escherichia coli* cells and 400 MPa for 30 min for *Bacillus subtilis* spores, after the alternating current treatment, resulted in reduced surviving fractions of both the organisms. The combined effect was also shown to reduce the tolerant level of microorganisms to other challenges (Shimada and Shimahara, 1985, 1987; Shimada, 1992).

4.3 ULTRASOUND

The pretreatment with ultrasonic waves (100 W/cm² for 25 min at 25°C) followed by high pressure (400 MPa for 25 min at 15°C) was shown to result in complete inactivation of *Rhodotulora rubra*. Neither ultrasonic nor high-pressure treatment alone was found to be effective (Knorr, 1995).

4.4 CARBON DIOXIDE AND ARGON

Heinz and Knorr (1995) reported a 3 log reduction of supercritical CO₂ pretreated cultures. The effect of the pretreatment on germination of *Bacillus subtilis* endospores was monitored. The combination of high pressure and mild heat treatment was the most effective in reducing germination (95% reduction), but no spore inactivation was observed. Park, Lee, and Park

(2002) studied the combination of high pressure carbon dioxide and high pressure as a non-thermal processing technique to enhance the safety and shelf life of carrot juice. The combined treatment of carbon dioxide (4.90 MPa) and high-pressure treatment (300 MPa) resulted in complete destruction of aerobes. The increase in high pressure to 600 MPa in the presence of carbon dioxide resulted in reduced activities of polyphenoloxidase (11.3%), lipoxygenase (8.8%), and pectin methylesterase (35.1%). Corwin and Shellhammer (2002) studied the combined effect of high-pressure treatment and CO₂ on the inactivation of pectinmethylesterase, polyphenoloxidase, *Lactobacillus plantarum*, and *Escherichia coli*. An interaction was found between CO₂ and pressure at 25 and 50°C for pectinmethylesterase and polyphenoloxidase, respectively. The activity of polyphenoloxidase was decreased by CO₂ at all pressure treatments. The interaction between CO₂ and pressure was significant for *Lactobacillus plantarum*, with a significant decrease in survivors due to the addition of CO₂ at all pressures studied. No significant effect on *E. coli* survivors was seen with CO₂ addition. Truong, Boff, Min, and Shellhammer (2002) demonstrated that the addition of CO₂ (0.18 MPa) during high pressure processing (600 MPa, 25°C) of fresh orange juice increases the rate of PME inactivation in Valencia orange juice. The treatment time due to CO₂ for achieving the equivalent reduction in PME activity was from 346 s to 111 s, but the overall degree of PME inactivation remained unaltered. Fujii, Ohtani, Watanabe, Ohgoshi, Fujii, and Honma (2002) studied the high-pressure inactivation of *Bacillus cereus* spores in water containing argon. At the pressure of 600 MPa, the addition of argon reportedly accelerated the inactivation of spores at 20°C, but had no effect on the inactivation at 40°C.

4.5 MICROBIAL PEPTIDES

The complex physicochemical environment of milk exerted a strong protective effect on *Escherichia coli* against high hydrostatic pressure inactivation, reducing inactivation from 7 logs at 400 MPa to only 3 logs at 700 MPa in 15 min at 20°C. A substantial improvement in inactivation efficiency at ambient temperature was achieved by the application of consecutive, short pressure treatments interrupted by brief decompressions. The combined effect of high pressure (500 MPa) and natural antimicrobial peptides (lysozyme, 400 µg/ml and nisin, 400 µg/ml) resulted in increased lethality for *Escherichia coli* in milk (Garcia, Masschalck, and Michiels, 1999).

5 OPPORTUNITIES FOR HIGH PRESSURE ASSISTED PROCESSING

The inclusion of high-pressure treatment as a processing step within certain manufacturing flow sheets can lead to novel products as well as new process development opportunities. For instance, high pressure can precede a number of process operations such as blanching, dehydration, rehydration, frying, and solid-liquid extraction. Alternatively, processes such as gelation, freezing, and thawing, can be carried out under high pressure. This section reports on the use of high pressures in the context of selected processing operations.

5.1 BLANCHING

Eshtiaghi and Knorr (1993) employed high pressure around ambient temperatures to develop a blanching process similar to hot water or steam blanching, but without thermal degradation; this also minimized problems associated with water disposal. The application of pressure (400 MPa, 15 min, 20°C) to the potato sample not only caused blanching but also resulted in a four-log cycle reduction in microbial count whilst retaining 85% of ascorbic acid. Complete inactivation of polyphenoloxidase was achieved under the above conditions when 0.5% citric acid solution was used as the blanching medium. The addition of 1% CaCl₂ solution to the medium also improved the texture and the density. The leaching of potassium from the high-pressure treated sample was comparable with a 3 min hot water blanching treatment (Eshtiaghi and Knorr, 1993). Thus, high-pressures can be used as a non-thermal blanching method.

5.2 DEHYDRATION AND OSMOTIC DEHYDRATION

The application of high hydrostatic pressure affects cell wall structure, leaving the cell more permeable, which leads to significant changes in the tissue architecture (Farr, 1990; Dornenburg and Knorr, 1994; Rastogi, Subramanian, and Raghavarao, 1994; Rastogi and Niranjana, 1998; Rastogi, Raghavarao, and Niranjana, 2005). Eshtiaghi, Stute, and Knorr (1994) reported that the application of pressure (600 MPa, 15 min at 70°C) resulted in no significant increase in the drying rate during fluidized bed drying of green beans and carrot. However, the drying rate significantly increased in the case of potato. This may be due to relatively limited permeabilization of carrot and beans cells as compared to potato. The effects of chemical pre-treatment (NaOH and HCl treatment) on the rates of dehydration of paprika were compared with products pre-treated by applying high pressure or high intensity electric field pulses. High-pressure (400 MPa for 10 min at 25°C) and high intensity electric field pulses (2.4 kV/cm, pulse width 300 µs, 10 pulses, pulse frequency 1 Hz) were found to result in drying

rates comparable with chemical pre-treatments. The latter pre-treatments, however, eliminated the use of chemicals (Ade-Omowaye, Rastogi, Angersbach, and Knorr, 2001). maximum value of diffusion coefficient observed represented an eight-fold increase over the values at ambient pressure.

The synergistic effect of cell permeabilization due to high pressure and osmotic stress as the dehydration proceeds was demonstrated more clearly in the case of potato (Rastogi, Angersbach, and Knorr, 2000a, 2000b, 2003). The moisture content was reduced and the solid content increased in the case of samples treated at 400MPa. The distribution of relative moisture (M/Mo) and solid (S/So) content as well as the cell permeabilization index (Z_p) indicate that the rate of change of moisture and solid content was very high at the interface and decreased towards the center (Rastogi, Angersbach, and Knorr, 2000a, 2000b, 2003).

5.3 REHYDRATION

Most dehydrated foods are rehydrated before consumption. Loss of solids during rehydration is a major problem associated with the use of dehydrated foods. Rastogi, Angersbach, Niranjana, and Knorr (2000c) have studied the transient variation of moisture and solid content during rehydration of dried pineapples, which were subjected to high pressure treatment prior to a two-stage drying process consisting of osmotic dehydration and finish-drying at 25°C. The diffusion coefficients for water infusion as well as for solute diffusion were found to be significantly lower in high-pressure pre-treated samples. The observed decrease in water diffusion coefficient was attributed to the permeabilization of cell membranes, which reduces the rehydration capacity (Rastogi and Niranjana, 1998). The solid infusion coefficient was also lower, and so was the release of the cellular components, which form a gel-network with divalent ions binding to de-esterified pectin (Basak and Ramaswamy, 1998; Eshtiaghi, Stute, and Knorr, 1994; Rastogi Angersbach, Niranjana, and Knorr, 2000c). Eshtiaghi, Stute, and Knorr (1994) reported that high-pressure treatment in conjunction with subsequent freezing could improve mass transfer during rehydration of dried plant products and enhance product quality.

Ahromit, Ledward, and Niranjana (2006) explored the use of high pressures (up to 600 MPa) to accelerate water uptake kinetics during soaking of glutinous rice. The results showed that the length and the diameter the of the rice were positively correlated with soaking time, pressure and temperature. The water uptake kinetics was shown to follow the well-known Fickian model. The overall rates of water uptake and the equilibrium moisture content were found to increase with pressure and temperature. Zhang, Ishida, and Isobe (2004) studied the effect of high pressure treatment (300–500 MPa for 0–380 min at 20°C) on the water uptake of soybeans and resulting changes in their microstructure. The NMR analysis indicated that water mobility in high-pressure soaked soybean was more restricted and its distribution was much more uniform than in controls. The SEM analysis revealed that high pressure changed the microstructures of the seed coat and hilum, which improved water absorption and disrupted the individual spherical protein body structures. Additionally, the DSC and SDS-PAGE analysis revealed that proteins were partially denatured during the high pressure soaking. Ibarz, Gonzalez, Barbosa-Canovas (2004) developed the kinetic models for water absorption and cooking time of chickpeas with and without prior high-pressure treatment (275–690 MPa). Soaking was carried out at 25°C for up to 23 h and cooking was achieved by immersion in boiling water until they became tender. As the soaking time increased, the cooking time decreased.

High-pressure treatment for 5 min led to reductions in cooking times equivalent to those achieved by soaking for 60–90 min. Ramaswamy, Balasubramaniam, and Sastry (2005) studied the effects of high pressure (33, 400 and 700 MPa for 3 min at 24 and 55°C) and irradiation (2 and 5 kGy) pre-treatments on hydration behavior of navy beans by soaking the treated beans in water at 24 and 55°C. Treating beans under moderate pressure (33 MPa) resulted in a high initial moisture uptake (0.59 to 1.02 kg/kg dry mass) and a reduced loss of soluble materials. The final moisture content after three hours of soaking was the highest in irradiated beans (5 kGy) followed by high-pressure treatment (33 MPa, 3 min at 55°C). Within the experimental range of the study, Peleg's model was found to satisfactorily describe the rate of water absorption of navy beans.

5.4 FRYING

A reduction of 40% in oil uptake during frying was observed, when thermally blanched frozen potatoes were replaced by high pressure blanched frozen potatoes. This may be due to a reduction in moisture content caused by compression and decompression (Rastogi and Niranjana, 1998), as well as the prevalence of different oil mass transfer mechanisms (Knorr, 1999).

5.5 SOLID LIQUID EXTRACTION

The application of high pressure leads to rearrangement in tissue architecture, which results in increased extractability even at ambient temperature. Extraction of caffeine from coffee using water could be increased by the application of high pressure as well as increase in temperature (Knorr, 1999). The effect of high pressure and temperature on caffeine extraction was compared to extraction at 100°C as well as atmospheric pressure. The caffeine yield was found to increase with temperature at a given pressure. The combination of very high pressures and lower temperatures could become a viable alternative to current industrial practice.

5.6 PRESSURE SHIFT FREEZING AND PRESSURE ASSISTED THAWING

Slow freezing may cause extensive structural damage due to the formation of larger ice crystals. It may also result in higher enzyme and microbial activities as well as increased oxidation rates, resulting from increased solute concentration and the insolubility of oxygen in ice. Rapid freezing using cryogenics induces cracking because of two effects: the initial decrease of volume due to cooling and the subsequent increase in volume due to freezing (Kalicevsky, Knorr, and Lillford, 1995). The reduction in freezing point under pressure causes super cooling upon pressure release and promotes rapid ice nucleation and growth throughout the sample, producing small ice crystals, rather than an ice front moving through the sample. Generally, thawing occurs more slowly than freezing, potentially allowing further damage to the sample. High pressure induced thawing reduces the loss of the water holding capacity and improves color and flavor preservation in fruit. Benet, Schlueter, and Knorr (2004) provided an extensive terminology for freezing and thawing processes including pressure-shift thawing.

5.7 GELATION AND RHEOLOGY

High pressure causes gelation of protein as well as polysaccharides. This phenomenon may be used for the modification of functional properties of foods. High pressure induced polysaccharide gels could be created during cold storage of pasteurized kiwi or strawberry puree (Knorr, 1999). Abbasi and Dickinson (2001) reported pressure-induced gelation of skim milk powder dispersions before and after high pressure treatment containing 9-15% casein in the presence of various sugars such as sucrose, glucose, and fructose. The gel like characteristics could be obtained after high-pressure treatment at much lower levels of casein. The gel behavior was independent of the type of sugars, duration, and intensity of pressure and process temperature. Pressure-induced gelation was inhibited at total sugar contents higher than 45–50%. Famelart, Chapron, Piot, Brule, and Durier (1998) showed that no gel formation was observed following high-pressure treatment (200 or 400 MPa for 10 or 30 min) of milk. Ultrafiltered and microfiltered milk concentrate could form gel, but the firmness of gels decreased with an increase in citrate concentration and increased with an increase in protein concentration and the maximum gel firmness was observed at pH 5.9. Whey concentrate formed gels at pH 9.0. The increase in the protein content of whey concentrate had no effect on the firmness of whey concentrate gels whereas increasing the pressure from 200 to 400 MPa resulted in firmer gels. Keim and Hinrichs (2004) indicated that the application of high pressure (600 MPa for 0–30 min at 30°C) formed stable gel of whey protein isolate. These workers also showed that the content of the native whey protein fractions alpha-lactalbumin and beta-lactoglobulin A and B, decreased and the amount of intermolecular disulfide bonds increased with prolonged pressure holding time. The gels became stronger and more elastic with increasing holding time.

Ahmed and Ramaswamy (2003) showed that both pressure and heat-induced glocomarcopeptide samples followed the Herschel-Bulkley model and indicated the presence of yield stress. It exhibited shear-thinning behavior. The consistency coefficient and apparent viscosity were reported to increase with pressure up to 300 MPa and after 300 MPa these values decreased. Dickinson and James (1998) studied the effect of high pressure and thermal treatment on flocculation and rheology of model oil-in-water emulsions stabilized by beta-lactoglobulin. HPP induced significant levels of flocculation in the model oil-in-water emulsions and altered the droplet size distribution and rheological behavior. The proportion of unadsorbed protein greatly influenced the extent of flocculation. Elevated pressure treatment (800 MPa for 60 min at ambient temperature) was found to be equivalent to relatively mild thermal treatment (65°C for 5 min). The changes in rheological properties of these systems following high-pressure treatment were attributed to pressure-induced denaturation and gelation of beta-lactoglobulin in the continuous phase of the emulsion (Dickinson and James, 1999). Arora, Chism, and Shellhammer (2003) studied the effect of high pressure treatment on the stability and the rheology of acidified model oil-in-water emulsions containing canola oil, whey protein isolate, polysorbate 60, soy lecithin, and xanthan. Exposure to high pressures up to 800 MPa for 5 min at 30°C did not significantly affect the equivalent surface mean diameter, flow behavior, and viscoelasticity.

The pressure treatment had a negligible effect on emulsion stability, whereas the presence of xanthan (0.2% w/w) resulted in improved stability. Soy lecithin-stabilized emulsions resulted in larger mean particles sizes and lower emulsion volume indices than the other emulsions, indicating that the potential instability and application of pressure further destabilized these emulsions. Ahmed and Ramaswamy (2004, 2005) demonstrated that under pressure xanthan gum displayed pseudoplastic behavior with yield stress, and the Herschel-Bulkley model could be used to describe the flow behavior. The application of pressure induced slight structural breakdown in the gum, which exhibited slight thixotropy at higher concentration. The consistency coefficient and apparent viscosity were affected by both the applied pressure and the concentration of the gum, whereas the flow behavior index and yield stress were affected by concentration.

6 SOME PRACTICAL CHALLENGES

Although HPP offers a number of opportunities, there are several challenges, which have to be addressed before a wider industrial application is considered.

6.1 HEAT TRANSFER UNDER HIGH PRESSURE AND PROCESS IN-HOMOGENEITIES

Most of the high-pressure applications in food are not only pressure dependent but also temperature dependent. In most studies available in literature, the contribution of temperature during the treatment has not been considered. The evolution of temperature is very important on account of its effect on food gelling, protein stability, fat migration, freezing etc. The main difficulty in monitoring or modeling heat transfer in high pressure processes is the lack of data on thermophysical properties under pressure. Denys, Van Loey, Hendrickx, and Tobback (1997) stated that the temperature history of a product under pressure is essential for the optimization and design of industrial processes.

6.1.1 THERMAL EFFECTS DURING HIGH PRESSURE PROCESSING

During high pressure processing, the temperature of food material increases as a result of physical compression. The pressure increase during the come-up time from an initial pressure P_s to P_1 increases the temperature. The magnitude of temperature increase, in part, depends upon the initial temperature, material compressibility and specific heat, and the target pressure. The maximum product temperature at process pressure is independent of the compression rate as long as heat transfer to the surroundings is negligible. It is further interesting to note that while the rate of temperature increase of the water-like substances is in phase with the change in pressure, fatty substances often exhibit a time delay of 30–60 s before reaching the maximum temperature (T_1). This may be attributed to the difference in their respective molecular structure (Rasanayagam, Balasubramaniam, Ting, Sizer, Bush, and Anderson, 2003). During the pressure holding time (P_1 to P_2), the temperature of the product

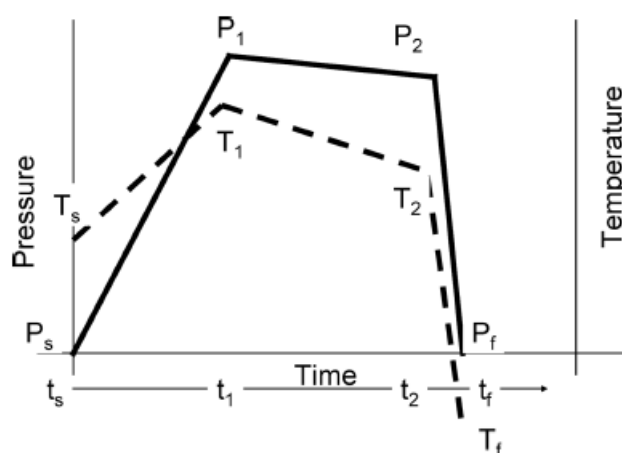


Fig. 2. Variation of pressure and temperature in a non-insulated high-pressure vessel

decreases from T1 to T2 due to heat loss through the pressure vessel. Immediately after depressurization, the product temperature returns to a value, slightly lower than the initial temperature. Thus, high pressure offers a unique way to increase the temperature of the product only during the treatment.

6.1.2 PRESSURE NONUNIFORMITY

Minerich and Labuza (2003) demonstrated that the process of homogeneity in pressure vessels is still an issue that needs attention. Using custom made copper tablets the authors demonstrated that the density of the tablet increased proportionately as the pressure increased between 400 and 600 MPa. The change in density of the tablet placed in the geometric center of a large food product, such as a ham, indicated that the ham received approximately 9 MPa less pressure than the processing system delivered ($P < 0.017$), challenging the assumption that all foods follow the isostatic rule. Authors, finding may have implications when determining the microbial lethality for large food items pasteurized or sterilized using high pressure. More research is needed to evaluate pressure uniformity within a larger pressure volume as well alternative approaches that can verify the above findings.

6.1.3 COMPRESSION HEATING OF FOOD MATERIALS

All compressible substances change temperature during physical compression and this is an unavoidable thermodynamic effect (Ting, Balasubramaniam, and Raghubeer, 2002). Water has the lowest compression heating values, while fats and oils have the highest. For example, at pressures normally encountered during HPP (400–1000 MPa), under adiabatic conditions near room temperature, water typically changes 3°C for every 100 MPa pressure change. Further, the compression heating value for water increases with temperature. Since water is the main ingredient in most foods, adiabatic temperature changes exhibited by most foods are very similar to that of water, except for oil and alcohol. Fats and oils show the highest compression heating values (6 to 8.7°C per 100 MPa) (Rasanayagam Balasubramaniam, Ting, Sizer, Bush, and Anderson, 2003). Similarly, the temperature of pressure transmitting fluid will also change after compression depending on its own thermal properties and will influence the temperature of the sample. This process can introduce additional temperature gradients in the product (Denys, Van Loey, and Hendrickx, 2000a). The difference between the temperature of a product (say, meat) and pressuring fluid (water), over a range of pressures under adiabatic compression, is shown in Fig. 10. This difference can also be attributed to the differences in the thermal properties. Balasubramanian and Balasubramaniam (2003) studied the apparent temperature increase of selected pressure-transmitting fluids (food-grade water-based glycol at different concentrations or 2% sodium benzoate solution) during HPP using a pilot scale food processor, together with the effects of these fluids on the inactivation of *Bacillus subtilis*. The highest temperature increase was reported for pressure-transmitting fluid containing 75% glycol,

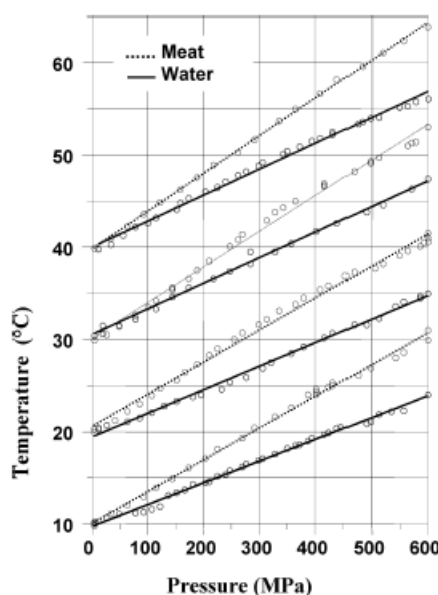


Fig. 3. Difference between the temperature of the product (meat) and pressuring fluid (water) over a range of pressure under adiabatic compression (Knorr, 2004).

whereas the fluid containing the highest amount of water (2% sodium benzoate solution) showed the lowest temperature increase, initial temperature, holding time, target pressure, compressibility, and rate of heat loss to the surroundings. Fluid properties such as thermal conductivity, viscosity, and specific heat also affected the temperature change. Change in pressure transmitting fluid temperature as a result of compression heating and subsequent heat transfer should be considered in HPP microbial inactivation.

7 APPLICATION OF HPT IN FOOD PRESERVATION

HPT finds application in food preservation in many ways. Some example of areas where HPT has more potential is discussed under the following headings.

7.1 FRUITS AND VEGETABLES

HPT does not depreciate the nutritional and sensory characteristics of food, and yet it maintains the shelf life. As compared the effect of HPT with water blanching on the microbial safety, quality (softness), and functionality (poly phenol oxidase (PPO) activity, leaching of potassium, and loss of ascorbic acid) of potato cubs. Total inactivation of microbes and PPO activity occurred at 200C (using dilute citric acid solution at 0.5 at 1.0 % as immersion medium). Water-balanced and high pressure treated potato cubes had similar softness but potassium leaching was reduced by 20 % in addition, ascorbic acid was better retained (90% at 50C to 35% at 500C) in high pressure treated vacuum packaged samples.

7.2 MEAT AND FISH INDUSTRY

Researchers have studied the application of HPT in the meat industry using several combinations of pressure, time and temperature. The high pressure inactivates *Citrobacter freundii*, *Pseudomonas fluorescens*, and *Listeria innocua* were completely inactivated at pressures more than 280,200 and 400 MPa, respectively at 200C. They also noticed a paler color in samples of minced beef treated at pressures more than 150 MPa, and grayish color in samples at pressures more than 350 MPa. Total inhibition of microorganisms occurred at 400-500 MPa. However, *pseudomonas spp.* was detected after 3-9 days at 30C, which means that they were not fully inactivated but stressed during HPT. Therefore, HPT should be coupled with some other treatment (e.g, moderate temperature of 500C) to eliminate viable *pseudomonas spp.* The effects of HPT on color and myoglobin content of minced beef samples packaged under vacuum, air or oxygen. They noticed a pink color of meat treated at 200-350 MPa (increase in lightness, color values) which turned Grey brown at 400-500 MPa (a decrease in L values). They suggested that meat discoloration during HPT is due to whitening effect of 200-300 MPa, caused by globin denaturation, heme displacement or release or oxidation of ferrous myoglobin to ferric myoglobin at 400 MPa.

Table 1. Application of HPT in Fruits and Vegetables.

Product	Pressure(MPa)	Holding time (min)	Temperature (°C)
Potato cubes	400	15	5-50
Chopped tomatoes	400,600 or 800	3.5-7.0	
Apricot nectar, distilled water	600-900	1-20	20
Jams			
White and red grape must	304-811	1-5	25
Angelica keiskei juice	0.01	7	25
Fresh apples, pears, bananas		6,15	25
Citrus juice	300-375	1-1.5	0-5
Orange juice	350	1	30
Vegetables juices ,carrot, cauli flower, spinach, tomatoes, strawberries	300,370	10	35
Guava puree	400,600	15	25
Extrac virgin olive and seed oils(grape seed, sunflower, soyaben, peanut	700	10	25

Table 2. Application of HPT in retention of sensory and nutritional characteristics of fruits and vegetables.

Product	Process and Quality attributes
Avocado puree	Prevent discoloration , Inhibit of undesirable browning reactions in presence of low pH
Banana puree	Prevent discoloration, reduction in polyphenol oxidase activity when combined with blanching
Black beans	Cooking ,increasing water absorption, reduced cooking time
Jam	Commercial production ,improved retention of colour and flavor of fresh fruit
Orange juice, Pink grape juice,	Preservation ,retention of colour and cloud stability during storage
Potato	Freezing ,reduction in freezing time in potato cylinder
Tomato juice	Juice production ,modification of physical and sensory properties

7.3 DAIRY AND EGG INDUSTRY

High pressure technology may also have application in the dairy and egg industries due to changes induced the functional properties of whey protein as well as in other milk components and native constituents. The pressure was applied to the protein before homogenization or to the emulsion prepared with native WPC. Functional properties of WPC were examined along with the relationship between stability of WPC emulsions and degree of adsorption of the protein emulsifier. They found that oil-in water emulsions (0.4 wt % protein, 20 vol % n-Tetradecane, pH 7) prepared with pressure treated WPC solutions gave a broader droplet size distribution than emulsions made with native untreated protein. An inverse relationship was obtained between emulsifying efficiency and applied pressure plus treatment time. Also, HPT had little effect on the stability of WPC emulsions made with native protein. The high pressure slightly improved the microbiological quality of milk without modifying lacto peroxidase activity (a native milk enzyme). β -lactalbumin and bovine serum albumin were pressure resistant (400 MPa for 60 min.). The increase in cheese yield was found (at 300 and 400 MPa) in conjunction with additional β -lactoglobulin and moisture retention. They concluded that HPT can improve the coagulation properties of milk and can increase moisture retention of fresh cheese.

Table 3. Application of high pressure technology in the Meat industry

Meat type	Pressure(MPa)	Holding time (min.)	Temperature (°C)
Minced beef muscle	230	20	4,25,35,50
Minced beef muscle	50-400	20	20
Minced beef muscle	200-450	20	
Minced beef muscle	200-500	20	25
Pork slurries	300	10	
Surimi pate	100-600	10	05
Minced macked meat	203	60	2-8
Creamed salamon	700	03	2 or 25
Freshly ground raw chicken meat	408-818	10	
Minced pork	800	20	20
Fresh beef	800-1000	20	25
Lamb meat	200	30	30
hams	300	5,15,25	20

Table 4. Application of HPT in Dairy and egg industry

Milk type	Pressure (MPa)	Holding time (min)	Temperature (°C)
Raw milk	100-400	10-60	20
Whey protein concebrtrate	200,400 or 800	10,20 or 40	20
Skim milk	310	0.05	25
Goat milk	500	10	25 or 50
Skim milk	250,450 or 800	10,20 or 40	25
Fresh goat milk cheese	400 or 500	5,10 or 15	2,10 or 25
Whipped and coffee cream	100-550	10	10-24
Milk	50-350	12	20

8 PACKAGING REQUIREMENTS OF HIGH PRESSURE PROCESSED FOODS

High-pressure technology involves different packaging considerations, based on whether a product is processed in-container or packaged after processing. Continuous or semi-continuous systems are used in the case of pumpable products, which are aseptically packaged after pressure treatment. On the other hand, flexible or partially rigid packaging is best suited for batch in container processing. The effectiveness of HPP is greatly influenced by the physical and mechanical properties of the packaging material. The packaging material must be able to withstand the operating pressures, have good sealing properties, and the ability to prevent quality deterioration during the application of pressure. At least one interface of the package should be flexible enough to transmit the pressure. Thus, rigid metal, glass, or plastic containers cannot be used. The headspace must also be minimized while sealing the package, in order to ensure efficient utilization of the package as well as space within the pressure vessel. This also minimizes the time taken to reach the target pressure.

Nachamanson (1995) showed that film barrier properties and structural characteristics of polymer based packaging material were unaffected when at pressures of 400 MPa, when exposed for 30 min at 25°C. Masuda, Saito, Iwanami, and Hirai (1992) examined the effect of high pressure on water vapor and oxygen permeability, tensile strength, and heat seal performance of gas barrier composite films. Dobias, Voldrich, Marek, and Chudackova (2004) examined the suitability of several homogeneous and multi-layered packaging for: changes in mechanical properties (tensile and seal strengths), transparency, water vapor permeability, migration characteristics into fatty food simulants, and transfer of water and olive oil into the materials; a pressure of 600 MPa was applied for 60 min. HPP was particularly found to affect the sealability of single layered films and the overall migration. Schauwecker, Balasubramaniam, Sadler, Pascall, and Adhikari (2002) investigated the migration of 1,2-propanediol (PG) through selected food packaging films exposed to HPP. No detectable PG migration into the Polyester/Nylon/Al/PP meal ready- to eat (MRE) type pouches was observed. PG migration into the Nylon/EVOH/PE (EVOH) pouches was similar at 30, 50, and 75°C after ten minutes under atmospheric pressure. However, the PG migration into the EVOH pouches significantly decreased when treated with high pressure at 30, 50, and 75°C. At 75, and 50°C, the PG migration was significantly higher than the amounts detected at 30°C. Visible signs of delamination between the polypropylene (PP) and aluminum (Al) layers were observed in the MRE pouches processed at ≥ 200 MPa and 90°C for ten minutes. This delamination appeared to occur between the PP and Al layers. The Differential scanning calorimetric analyses and Fourier Transform Infrared (FTIR) spectra were similar for the high-pressure treated pouches when compared to their respective controls. This indicated that there was no HPP induced molecular changes to the treated pouches.

Caner, Hernandez, Pascall, and Riemer (2003) used C mode scanning acoustic microscopy (C SAM) and scanning electron microscopy (SEM) to examine structural damage to films and found no marked changes. However, structural damage to the metallized PET was identified. Goetz and Weissner (2002) studied the permeation and migration of volatile compounds through plastics used in food packaging. The extent of permeation and migration was found to depend on pressure and time; some reversible structural changes were also detected. Caner, Hernandez, and Pascall (2000) studied the permeance and transmission rates of water vapor, CO₂, and O₂ of various laminated flexible films exposed to high pressure processing. Prolonged exposure had a greater effect on the permeance of inorganic layers in some films, than lower pressure/time combinations. Metallized PET was most adversely affected by high pressure, the water vapor transmission being more severely affected than gas transmission. The increase in permeance of all most films was less than 11%, making them suitable for use in high pressure processing. The permeance of metallized PET, on the other hand, increased by 150% hence it was deemed to be unsuitable. Caner, Hernandez, Pascall, Balasubramaniam, and Harte (2004) studied the effect of high-pressure processing on the sorption behavior of D-limonene in selected packaging materials such as monolayer polypropylene, multilayer polyethylene/ nylon/ethylene vinyl alcohol/ polyethylene, and metallized PET/ethylenevinyl acetate/linear LDPE films. It was shown that with the exception of the metallized PET/ethylenevinyl acetate/linear LDPE films, high-pressure processing did not markedly affect D-limonene in the liquid simulated foods or the packaging films. Caner, Hernandez, and Harte (2004) reviewed the effects of high-pressure processing on packaging materials, the commercial applications of HPP in food processing, packaging materials suitable for high pressure processing, effects of HPP on barrier properties of packaging films, and mechanical properties of flexible packaging films after high pressure processing.

Lambert, Demazeau, Largeteau, Bouvier, Laborde, and Cabannes (2000) studied the effect of high pressure on tensile strength, heat seal strength, delamination, film structure, oxygen barrier permeability, water vapor barrier permeability, and migration characteristics. They observed that the package prepared by cast coextrusion was susceptible to de-lamination, whereas the packages prepared by tubular extrusion were more robust in terms of barrier properties, migration, and overall integrity. Kuebel, Ludwig, Marx, and Tauscher (1996) showed that systems containing the aroma compounds p-cymene and acetophenone were quickly absorbed by packaging films, leading to a rapid reduction in aroma concentration. It was observed that the distribution of aroma compounds was a function of polarity. Under elevated pressures, the concentration

of aroma compounds decreased less than under atmospheric pressure. High pressure raised the diffusion barrier of polymers, probably due to the transition of the material into a glassy state.

Rubio, Lagarón, Muñoz, Almenar, Catalá, Gavara, and Pascall (2005) studied the effect of high-pressure treatments (400 and 800 MPa, 5 and 10 min, 40, and 75°C) on EVOH-based packaging materials and they were compared with the morphological effects produced by sterilization (120°C, 20 min). The oxygen barrier and morphological properties of the treated packaging structures were analyzed and compared with those of the untreated samples. The results indicated that high-pressure treatment scarcely affects packaging materials, especially when compared to the detrimental consequences of retorting.

9 EFFECT OF HIGH PRESSURE ON TOXINS, ALLERGENS, AND NUTRIENTS

Information relating to the effects of high pressure on toxins, allergens, and nutrients are rare. There are no published reports available on the toxicity of high-pressure processed foods. It is well known that high pressure processed food can modify the activity of some enzymes and the structure of some proteins. Although covalent bonds are not affected, hydrogen bonds as well as hydrophobic and intermolecular interactions may be modified or destroyed. Allergenicity is a key concern in the safety assessment of novel foods. The incidence of food allergies is rapidly increasing, as is their severity and the number of foods involved. In heat-treated products, protein denaturation reduces the allergenicity of many foods, but heat-denatured proteins can also present new antigenic sites. New studies on the putative allergenicity of high-pressure processed foods may be needed.

10 REGULATORY ASPECTS

Developing methods and techniques for validating any process can be challenging. For example, the U.S. Food and Drug regulations for pasteurization (21 CFR 131.3 and 21 CFR 1240.61) and sterilization (21 CFR 108, 113 and 114) primarily stipulate minimum temperature and time requirements for processing foods. Such information does not exist for high-pressure processed products and it is important to establish microbiological criteria for safe production of foods by HPP (Sizer, Balasubramaniam, and Ting, 2002). In the United States, the Food, Drug, and Cosmetic Act (FD&C Act), which requires all foods to be processed, packaged, and held under sanitary conditions, is the basis by which FDA promulgates specific regulations. Currently, high pressure pasteurized products (such guacamole and oysters etc.), distributed under refrigerated conditions. Similar to thermally pasteurized products, high pressure pasteurized products are required to be processed under GMP conditions and relevant commodity specific regulations (e.g., juice HACCP, Pasteurized Milk Ordinance (PMO), Sea Food HACCP etc). The potential for temperature abuse during refrigerated storage and distribution has to be carefully evaluated and minimized. Processors must also work with equipment vendors to ensure that any part of the pressure vessel, which may have incidental contact with the food, is only made from approved materials. Currently, high pressure sterilized low-acid shelf stable products are not commercially sold in the United States. However, various laboratories worldwide are conducting research which can aid in establishing criteria for the production of safe high pressure processed low-acid foods.

In EU countries, the national regulations relating to the application of the precautionary principle for new products have been replaced by a EU regulation for novel foods and ingredients (CE 258/97), which came into force in 1997. This legislation for “novel foods” establishes an evaluation and a license system, compulsory for all new foods and processes. High pressure processed foods are deemed to be “new” as well as “novel.” In order to simplify the regulation, it was recently admitted that any new product could be treated at a national regulation level, if it is possible to show that the product is substantially equivalent to a product already on the market.

11 CONCLUSION

In the coming years, HPP is likely to be used commercially with increasing demand, increasing production in turn lowering operating cost. Destruction of microorganisms and inactivation of enzymes at low or moderate temperatures without changing organoleptic and nutritional properties shows that high-pressure technology has the potential to be used in the development of a new generation of value added foods. HPP is not likely to replace traditional processing methods. Furthermore, predictable changes in functional characteristics of proteins and complex carbohydrates (where little work has been done), mean that there are some exciting avenues of work in HPT treatment of foods that remains to be explored. Although a lot of research has been conducted in the area of high pressure technology a lot remains to be done in terms of understanding the critical limits of the process and the extent to which this might ensure appropriate treatment of food material. The critical process factors in HPT include pressure, time at pressure, time to achieve treatment pressure,

decompression time, treatment temperature (including adiabatic heating), product initial temperature, vessel temperature distribution at pressure, product pH, product composition, product water activity, packaging material integrity and concurrent processing aids. Nevertheless, their novel physico-chemical and sensory properties offer exciting opportunities for industry. The combination of HPP with other processing options such as heat, gamma-irradiation, ultrasound, carbon dioxide, and anti-microbial peptides, can lower the pressures required. The process can be integrated to other processes such as blanching, dehydration, osmotic dehydration, rehydration, frying, extraction, gelation, freezing, and thawing. High capital expenditure may limit its application initially but this will be offset by lower operating costs since the energy used to pressurize is less than the energies used in thermal processing and other benefits with respect to product originality. With further progress of technology and its commercialization, it is expected that the cost of the equipment will come down in the near future and the high-pressure processed safe and nutritious products will be available to all consumers at an affordable cost.

ACKNOWLEDGEMENT

We are appreciative of the SHIATS University for its continuous support in the development of important technologies for the future use. The effort of higher authorities to promote the technologies has been very valuable in the promotion of new technologies. A special thanks goes to the dean and head of department for believing in our dream to develop new technologies. Many people have contributed either directly or indirectly to make this work a reality.

REFERENCES

- [1] Lopez FR, Carrascosa AV, Olano A (1996) The effect of high pressure whey protein denaturation and cheese making properties of raw milk. *J Dairy Sci* 79: 929-936.
- [2] Kunio K, Masao I, Yasuhiro Y, Kunihiro O, Takayuki F, et al. (1994) Comparison of keeping quality between pressure processed jam and heat processed changes in flavor components, hue and nutrients during storage. *Bio Sci Biotech Biochem* 58: 1386-1391.
- [3] Tauscher BK (1998) Effects of high and chemical reactions effects on nutrients pressure treatment to nutritive substances and natural pigments & fresh novel foods by high pressure. VTT symposium 186. Technical research center for Finland Helsinki, Finland.
- [4] Tauscher BK (1999) High pressure and chemical reactions effects on nutrients and pigments. *Emerging food Sci Tech Tempere Finland* 58: 22-24.
- [5] Cheftel JC (1995) Review: High pressure microbial inactivation and food preservation. *Food Sci Technol Int* 1: 75-90.
- [6] Leadly CE, Williams A (1997) High pressure technology of food and drinks an over-view of recent developments and future potential in: *New Technologies Bull.No.14*, Mar CCFRA, Chipping Campden, Glos, UK.
- [7] Bridgman PW (1914) The coagulation of albumen by pressure. *J Biol Chem* 19: 511-512.
- [8] Erkmén O, Karatas S (1997) Effects of high hydrostatics pressure on *Staphylococcus aureus* in milk. *J Food Eng* 33: 257-262.
- [9] Adapa S, Schmidt KA, Toledo R (1997) Functional properties of skim milk processed with continuous high pressure throttling. *J Dairy Sci* 80: 1941-1948.
- [10] Buchheim W, Frede E (1996) Use of high pressure treatment to influence the crystallization of emulsified fats. *Lebensm U Milchwirts* 117: 228-237.
- [11] Butz P, Edenharter R, Fister H, Tauscher B (1997) The influence of high pressure technology on anti mutagenic activities of fruits and vegetables juices. *Food Res Int* 30: 287-291.
- [12] Carlez A, Chefel JC, Veciana NT (1995) Changes in colour and myoglobin of minced beef due to high pressure processing. *LWT Food Sci Technol* 28: 528-538.
- [13] Lee DU, Park JY, Kang JI, Yeo IH (1996) Effect on high hydrostatic pressure on the shelf life and sensory characteristics of angelica keiskei juice. *Korean J Food Sci Technol* 28: 105-108.
- [14] Donshi G, Ferrari G, Matteo MD (1996) High pressure stabilization of orange juice evaluation of the effect of process conditions. *Ital J Food Sci* 8: 99-106.
- [15] Eshtiaghi MN, Knorr D (1993) Potato cubes response to water blanching and high hydrostatics pressure. *J Food Sci* 58: 1371-1374.
- [16] Felipe X, Capellas M, Lawm AJR (1997) Comparison of the effect of high pressure treatment and heat pasteurization on the whey proteins in goat's milk. *J Agri Food Chem* 45: 627-631.

- [17] Gaucheron F, Famelart MH, Mariette F, Raulot K, Michel F, et al. (1997) Combined effects of temperature and high pressure treatment on physiological characteristics of skim milk. *Food Chem* 59: 439-447.
- [18] Yen G, Lin H (1996) Comparison of high pressure treatment and thermal pasteurization effect on the quality and shelf life of guava puree. *Int J Food Sci technol* 31: 205-213.
- [19] Hite BH (1999) The effect of pressure in the preservation of milk bulletin of the west virginia University Agricultural Experiment Station 58: 15-35.
- [20] Kloczko I, Radomski M (1996) Preservation of fruits & vegetables and juices by high hydrostatics pressure. *Przemysl Spozywczy* 50: 25-26.
- [21] O'brien JK, Marshall RT (1996) Microbiological quality of raw ground chicken processed at high isostatic pressure. *J food Prt* 59: 146-150.
- [22] Pehessson PE (1996) Application of high pressure pasteurization to citrus processing in: Institute of Food technologies. *Ann Meet Book of Abstracts*: 108.
- [23] Shigehisa T, Ohmori T, Saito A, Taji S, Hayashi R (1991) Effects of high hydrostatics pressure on characteristics of pork slurries and inactivation of microorganisms associated with meat products. *Int J food Microbiol* 12: 207- 215.
- [24] Marta C, Montserrat MM, Esther S, Reyes P, Buenaventura G (1996) Population's aerobic mesophils and inoculated *E.Coli* during storage of fresh goat's milk cheese treated with pressure. *J Food Prot* 59: 582-587.
- [25] Carlez A, Chefel JC, Rose JP, Richard N, Saldana JL, et al. (1992) Effect of high pressure and bactiostatic agents on the destruction of *Citrobacter freundii* in minced beef muscle in Balny, Hayashir.
- [26] Carlez A, Chefel JC, Rosec JP, Richard N (1993) High pressure inactivation of *Citrobacter freundii*, *Pseudomonas fluorescens* and *Listeria innocua* in inoculated minced beef muscle. *LWT-Food Sci Technol* 26: 357-363.
- [27] Balasubramaniam, V.M., and Farkas, D. 2008. High Pressure Processing. *Food Sci. and Technol. Int.* In press.
- [28] Balasubramaniam, V.M., Ting, E.Y., Stewart, C.M., and Robbins, J.A. 2004. Recommended laboratory practices for conducting high pressure microbial inactivation experiments. *Innovative Food Sci. and Emerging Technol.* 5(3): 299-306.
- [29] Balny, C. and Masson, P. 1993. Effects of high pressure on proteins. *Food Rev. Int.* 9(4): 611-628. Black, E.P., Setlow, P., Hocking, A.D.,
- [30] Stewart, C.M., Kelly, A.L., and Hoover, D.G. 2007. Response of spores to high-pressure processing. *Comp. Rev. Food Sci. Food Safety* 6(4): 103-119. Cheftel, J.C. 1995. Review: High pressure, microbial inactivation, and food preservation. *Food Sci. and Technol. Int.* 1: 75-90.
- [31] Rastogi N.K, Raghavarao K.S.M.S, Balasubramaniam V. M, Niranjana K and Knorr D 2007. Opportunities and Challenges in High Pressure Processing of Foods. *J. Food Science and Nutrition*, 47:69-112
- [32] Kadam PS, Jadhav B A, Salve R V and Machewad G M 2012. Review on the High Pressure Technology (HPT) for Food Preservation. *J. Food Process Technol*, 3:1 :1-5
- [33] Hayman, M., Baxter, I., Oriordan, P.J., and Stewart, C.M. 2004. Effects of high-pressure processing on the safety, quality, and shelf life of ready-to-eat meats. *J. of Food Prot.* 67(8): 1709-1718.
- [34] H., Adams, R.M., Farkas, D.F., and Morrissey, M.T. 2002. Use of High-pressure Processing for Oyster shucking and shelf-life extension. *J. Food Sci.* 67(2): 640-645.
- [35] Heremans, K. 2003. The effect of high pressure on biomaterials. In "Ultra High Pressure Treatments of Foods" ed. Marc E.G. Hendrickx and Dietrich Knorr. pp. 23-52. Kluwer Academic/ Plenum Publishers, New York.
- [36] Hite, B.H. 1899. The effect of pressure in the preservation of milk. Washington, Va. Univ., Agriculture Experiment Station, Bulletin, 58: 15-35.
- [37] Hogan, E., Kelly, A., and Sun, D.W. 2005. High pressure processing of foods: An overview. In "Emerging technologies for food processing" ed. Sun, D.W., pp. 3-32. Elsevier Academic Press, London.
- [38] Margosch, D., Ehrmann, M.A., Buckow, R., Heinz, V., Vogel, R.F., and Gänzle, M.G. 2006. High-pressure mediated survival of *Clostridium botulinum* and *Bacillus amyloliquefaciens* endospores at high temperature. *Applied and Environ. Microbiol.* 72(5): 3476-3481.
- [39] Matser A.M., Krebbers B., Berg, R.W., and Bartels, P.V. 2004. Advantages of high pressure sterilisation on quality of food products. *Trends in Food Sci. and Technol.* 15(2): 79-85.
- [40] Patazca, E., Koutchma, T., and Balasubramaniam, V.M. 2007. Quasiadiabatic temperature increase during high pressure processing of selected foods. *J. Food Eng.* 80(1): 199-205.
- [41] Patterson, M.F. 2005. Microbiology of pressure-treated foods – A review. *J. Applied Microbiol.* 98(6): 1400-1409.
- [42] Rasanayagam, V., Balasubramaniam, V.M., Ting, E., Sizer, C.E., Bush, C., and Anderson, C. 2003. Compression heating of selected fatty food materials during high pressure processing. *J. Food Sci.* 68(1): 254-259.
- [43] Rastogi, N.K., Raghavarao, K.S.M.S., Balasubramaniam, V.M., Niranjana, K., and Knorr, D. 2007. Opportunities and challenges in high pressure processing of foods. *Crit. Rev. in Food Sci. Nutr.* 47(1): 69-112.
- [44] San Martin, M.F., Barbosa- Canovas, G.V., and Swanson, B.G. 2002. Food processing by high hydrostatic pressure. *Crit. Rev. in Food Sci. Nutr.* 42: 627-645.

- [45] Sáiz, A.H., Mingo, S.T., Balda F.P., and Samson C.T. 2008. Advances in design for successful commercial high pressure food processing. Food Australia, 60(4): 154-156. Samson, C. Tonello. 2008. Personal communication. NC
- [46] Hyperbaric, Spain. Smelt, J.P.P.M. 1998. Recent advances in the microbiology of high pressure processing. Trends in Food Sci. Technol. 9(4): 152-158. Tauscher, B. 1995. Pasteurization of food by hydrostatic high pressure: chemical aspects. Zeitschrift fuer Lebensmittel Untersuchung und Forschung 200: 3-13.
- [47] Torres, J.A. and Velazquez, G. 2005. Commercial opportunities and research challenges in the high pressure processing of foods. J. Food Eng. 67(1-2): 95-112.

AUTHOR'S BIOGRAPHY



RAVI SHANKAR- AMIMI, AMIAEI, AMIE, Pursuing M.Tech (4th sem) in Food Technology (Food Process Engineering), Department of Food Process Engineering, Vaugh School of Agriculture Engineering and Technology, SHIATS-Deemed University, P.O-Naini, Allahabad, U.P-211007, India. B.E in Food Technology, SLIET, Sangrur, (P.T.U) Punjab, India.

CORRESPONDENCE AUTHOR'S ADDRESS

Ravi Shankar

Duplex no. 40, Dev Villa, Post Office Road, Mango, Jamshedpur, Jharkhand-831001

r.shankar.mail@gmail.com

How admitted factors influence on quality management

Xu Yang and Christian Bach

Department of Technology Management,
University of Bridgeport
Bridgeport, CT, USA

ABSTRACT:

Purpose: Understand the definition of quality management and its important factors. Study the advantage and disadvantage of quality management in various fields.

Methodology: Literature reviews and case study will be used to obtain information thus forming ideas. Other research methods such as experiment, data acquisition, and analysis might be used in the following works.

Findings: Quality management is a useful technique in various fields, such as: business, education, non-profit organizations. There are five factors that have distinct impact on quality management: management style, leadership, employee involvement, customer satisfaction and quality standard.

Research limitations/implications: The definition of quality management is ambiguity in some aspects. Many middle managers are not very clear with the difference between quality assurance, quality control and quality management.

Practical implications: Quality management is not only confined into quality aspect. It is also contributing in making profit for the organization.

Originality/value: This paper engaged into investigating the benefit of quality management in different area and studies its factors which affect the performance of quality management. A new model has been built to illustrating the importance of quality management and its factors.

KEYWORDS: Quality management, Management style, Leadership, Employee involvement, Customer satisfaction, Standard

1 INTRODUCTION

While quality control (QC) and quality assurance (QA) departments in an organization are traditional sectors, the concept of quality management is relatively new. It is a technique that wildly implemented into various filed. (Apte & Reynolds, 1995; Benson, Saraph, & Schroeder, 1991; Birch & Pooley, 1995; Caswell, Bredahl, & Hooker, 1998; Hyde, 1992; Johnson, 1968; McNabb & Sepic, 1995; Mills & Rorty, 2002; Schonberger, 1992; Swiss, 1992). It is a tool that helps company producing qualified product thus accomplish the ultimate goal: making profit.

2 RESEARCH METHODOLOGY

Several research methods are used into this paper to form and improve ideas. A review centric research methodology has been adopted for this research paper. A research model has been built to illustrate main idea. The independent factor is quality management and dependent variables are analyzed by researching on journal articles. Case study is also used into this paper to discuss how additional factor affect on independent factor.

A flow chart of research process will be illustrated by following chart:

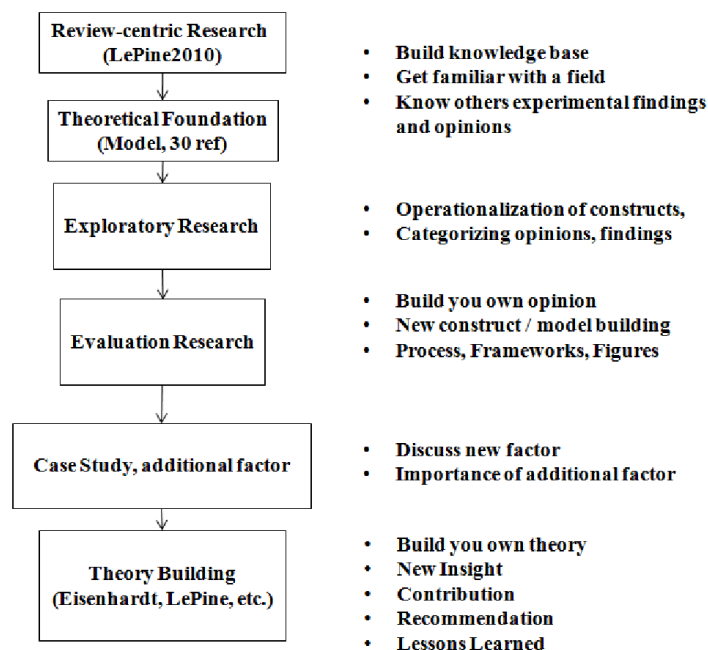


Figure 1 Research Process

3 SCIENTIFIC MODEL

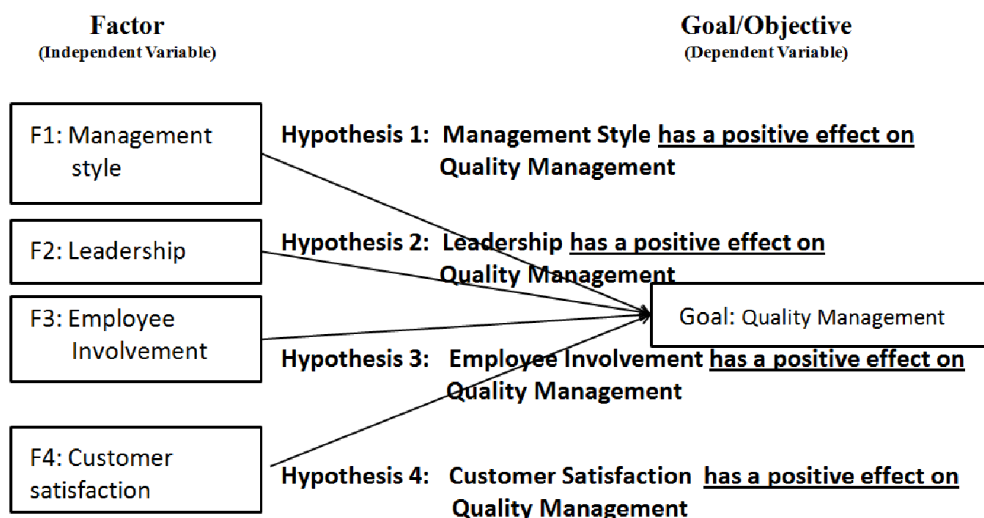


Figure 2: The quality management and its four independent variable factors

Goal-0: "Many organizations have arrived at the conclusion that effective quality management can enhance their competitive abilities and provide strategic advantages in the marketplace(Anderson, Rungtusanatham, & Schroeder, 1994) p.472."

Goal-1: "Empirical investigation shows that organizational characteristics matter in policy implementation of quality management in Hungarian higher education (Csizmadia, Enders, & Don, 2008) p.439."

Goal-2: "Total quality management has become something of a social movement. It has spread from its industrial origins to health care organizations, public bureaucracies, nonprofit organizations, and educational institution (Hackman & Wageman, 1995) p.309."

Goal-3: "Total quality management also demands a reexamination of procedures in an organization by employee teams, and this approach emphasizes patience and distrusts obvious answer (McGowan, 1995) p.323."

Goal-4: "Total Quality Management (TQM), with its emphasis on the organizational and socio-behavioral aspects of quality improvement, can add to existing research on systems quality management (Ravichandran & Rai, 1999) p.121."

Goal-5: "Researchers and practitioners have suggested that Total Quality Management (TQM) offers an effective approach to manage quality in the context of systems development (Ravichandran & Rai, 2000) p.382."

4 EMPIRICAL RESEARCH AND CASE STUDY ON OTHER FACTOR OF QUALITY MANAGEMENT

Four factors mentioned above interacts each other and has big impact on quality management. However, one more factor needs to be considered for the sake of better performing of quality management. This factor, unlike other factors, neither a quality technical approach nor a management goal, is something you must obey with and subject to. This factor is called standard.

Standard, as its name, is a norm. The definition of standard is "an idea or thing used as a measure, norm, or model in comparative evaluations". It presents a level of quality in no matter industries or organizations. There are tens thousands of standards all over the world. They played multiple roles such as regulating industries, normalizing services, and even being a symbol of qualities.

ISO (the International Organization for Standardization) is an organization that develops and publishes International Standards. There are almost 20000 ISO international standards issued and they cover all fields such as: Sustainable development, Food, Water, Automobile, Climate change, Renewable energy, Services, Health and other traditional industries. More and more consumers trust ISO more than multifarious advertisement thus forcing companies pursuing the ISO certification.

We now understand the importance of standard. However, as mentioned before, there are huge numbers of standards in the world; their authority and scope of application are different. A good quality management will choose the proper standards to help organization accomplish its ultimate goal.

To help audience better understand the importance in quality management, two cases will be introduced in the following:

Case 1: HM730—the missing jet from Malaysia

There is a Boeing 777 airplane disappeared from its air route on Mar 8th, 2014. It belongs to Malaysia Airlines and is reported hijacked by its captain. This event is seemed as a conspiracy since there are too many irregular reactions from both Malaysia Airlines and Malaysia army and there are too many abnormal phenomenons that cannot be well explained by current information. However, during the investigation, a risky issue is exposed to public: Two stolen passports used on this flight. This implies that Kuala Lumpur International Airport (KLIA) has a very serious safety issue.

As one of the largest international airport in Malaysia, KLIA is a very important transportation hub in Southeast Asia. Everything in this airport is progressive: word class equipment, advanced management and thoughtful service. The premium infrastructure and professional management lead to a high security level. However, how did two passages pass through security check with stolen passport? After investigation, the conclusion is this airport used a degraded security standard. Instead of using Interpol (International Criminal Police Organization) data base, KLIA use its own security system. Their system can only verify the authenticity of passport but check if it was stolen or not. A small leak will sink a great ship. An improper security standard makes an airline company and airport suffer the loss and makes passengers encounter danger.

Case 2: Chinese tea—facing export challenge

China is the world largest tea production country. Tea culture is becoming one of the symbols of China. There are lots of famous Chinese teas well known and exported to the world such as: Lungching Tea, Biluochun Tea, Tat-Kuan-Yin Tea, Red Robe Tea, Yunnan Puer. However, Chinese teas are involved into several negative reports. 17 kinds of pesticides were found in Chinese tea products. Pesticides such as Methomyl and Endosulfan which were found in Chinese tea have been identified high acute toxicity by The World Health Organization (WHO) and have been banned by globally. Chinese tea sellers are facing extremely challenge in their European and American market.

Tea culture as a symbol of China has a long history since Song Dynasty. There is a deep-seated concept in Chinese mind that tea has function of refreshing mind and eliminating toxin. Therefore, tea is a favorite drink in china and its heat gradually sweep around the world. Since China has a vast territory and has various kinds of tea, it becomes the world largest tea export country. Tea industrial chain rise in response of the huge demand from worldwide. Advanced management approach and efficient marketing technology were implemented into this industry. Instead of have their tea planting bases, those famous

tea distributors procure tea leaves from small farmland. One reason is reducing expense; another reason is traditional farm method will keep original taste of tea.

Tea flower and leaf is also favor by insects. Along with the global warming effect, the tea farm is overrun with insects. Traditional farm method is challenged by climate changing. So tea farmer can do nothing but spray and spray. Most of the tea distributors are certificated by QS which is the food safety certification of China. However, the QS certification standard is not as high as ISO and even much lower than European standards. Chinese distributors, therefore, are not qualified to be the tea vendor in most of the European marketing any more. This change forces Chinese distributor paying a bitter price. To be qualified by standards, it may require farmers spend more resources to accordance with those criterions and may require fees to maintain the certification. Compared with market potential, those upfront expenses are worthy. And if at all, compared with the bitter price of lost market share, those upfront fees can be ignored. Researchers also found the impact of standard on China's tea export. "The results also show that China's tea exports have been significantly restricted when importing countries increase coverage of tea safety standards concerning regulatory pesticides (Wei, Huang, & Yang, 2012) p.253."

5 NEW MODEL FORMING

There are several additional factors that may be tied to our topic. Since quality management is such a major topic that could related to and affect by many factors and their sub factors, we will screen them by following procedures: 1. Collecting 2. Narrow down 3. Ranking

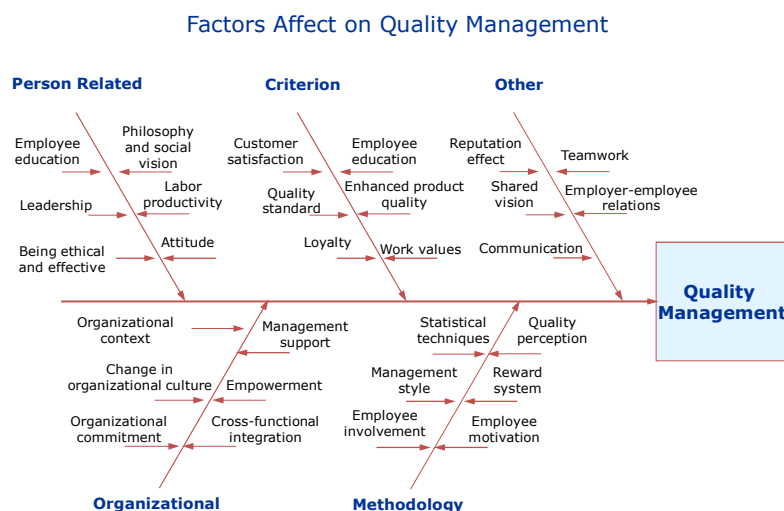


Figure 3 Factors affect on quality management

Based on figure above, it is obvious that quality management is affected by many factors. Those factors can be categories as person related, organizational, methodology, criterion and others. More or less, those factors are important to quality management decision. According to studies into this paper, 5 most important factors are selected and built into a scientific model.



Figure 4 Quality management and its 5 factors

6 CONCLUSION

Through the review of former literatures, some points of views are derived. Factors that affect the performance of quality management have been identified. Those factors mentioned in this paper will be parameters of organization performance for those companies who deemed quality is the crucial element in its organizational strategy. Competitiveness will be derived from high quality corporate output. Quality management as a new concept and useful tools has been wildly implemented into many fields. This paper was trying to find out factors that have big impact on quality management, thus, helping organizations and individuals understanding how to take advantage from it as much as possible.

Quality management has been identified as an important tool in modern management system. It has positive impact in not only industry but also in education and non-profit organizations. Moreover, quality management also helps organization to teamwork building, system developing, strategy forming and social behavior regulation. Quality management has been wildly implemented into many fields, thus, many factors may affect on the performance of quality management. Through literature reviews and case studies, five major factors have been identified and discussed. Those factors are: management style, leadership, employee involvement, customer satisfaction and quality standard.

Management style is generally categorized as promotion, operation and inspection. It affected by many factors such as ethics, region, culture and experience. Other factors also lead success management style such as decision-making responsibility, organizational structures. The adoption of correct management style will lead a success quality management. Based on studies above, leadership has its power on affecting quality through both product and service in business. It helps organization balancing the performance of improvement and the limitation of resources. Leadership is not a skill for leaders and managers, it is also a skill that followers should understand and study with. Rather than a goal, employee involvement is a useful tool for team work building, commitment forming, and target accomplishment. It will help employee to form a positive attitude to their work. For the long-term development of organization, employee involvement is necessary and important. Another factor is customer satisfaction which can be planted into all industries. It will not only bring long-term profit for business, but also increasing employee intrinsic motivation and enhancing customer loyalty. It is a reflection of organizational strategy and an advertisement of company performance. Besides of those factors, quality standard is also important. Through case study, even companies have advanced management style, adopting mature leadership and employee involvement, and customer satisfaction oriented, lack of emphasizing on quality standards will also lead a loss of market share and loss of competitiveness. Therefore, those five factors have interactions on quality management. And those dependent factors and independent factor played dramatic roles into the success of modern business.

REFERENCES

- [1] Anderson, J. C., Rungtusanatham, M., & Schroeder, R. G. (1994). A Theory of Quality Management Underlying the Deming Management Method. *The Academy of Management Review*, 19(3), 472-509. doi: 10.2307/258936
- [2] Apte, U. M., & Reynolds, C. C. (1995). Quality Management at Kentucky Fried Chicken. *Interfaces*, 25(3), 6-21. doi: 10.2307/25062008
- [3] Benson, P. G., Saraph, J. V., & Schroeder, R. G. (1991). The Effects of Organizational Context on Quality Management: An Empirical Investigation. *Management Science*, 37(9), 1107-1124. doi: 10.2307/2632329
- [4] Birch, N., & Pooley, J. (1995). Changes in Russian Quality Management Practices from 1989 to 1992. *MIR: Management International Review*, 35(3), 219-239. doi: 10.2307/40228274
- [5] Caswell, J. A., Bredahl, M. E., & Hooker, N. H. (1998). How Quality Management Metasystems Are Affecting the Food Industry. *Review of Agricultural Economics*, 20(2), 547-557. doi: 10.2307/1350007
- [6] Csizmadia, T., Enders, J., & Don, F. W. (2008). Quality Management in Hungarian Higher Education: Organisational Responses to Governmental Policy. *Higher Education*, 56(4), 439-455. doi: 10.2307/40269208
- [7] Hackman, J. R., & Wageman, R. (1995). Total Quality Management: Empirical, Conceptual, and Practical Issues. *Administrative Science Quarterly*, 40(2), 309-342. doi: 10.2307/2393640
- [8] Hyde, A. C. (1992). The Proverbs of Total Quality Management: Recharting the Path to Quality Improvement in the Public Sector. *Public Productivity & Management Review*, 16(1), 25-37. doi: 10.2307/3380803
- [9] Johnson, E. L. (1968). Economics of Water Quality Management. *Journal (American Water Works Association)*, 60(10), 1122-1128. doi: 10.2307/41265190
- [10] McGowan, R. P. (1995). Total Quality Management: Lessons from Business and Government. *Public Productivity & Management Review*, 18(4), 321-331. doi: 10.2307/3663055
- [11] McNabb, D. E., & Sepic, F. T. (1995). Culture, Climate, and Total Quality Management: Measuring Readiness for Change. *Public Productivity & Management Review*, 18(4), 369-385. doi: 10.2307/3663059
- [12] Mills, A. E., & Rorty, M. V. (2002). Total Quality Management and the Silent Patient. *Business Ethics Quarterly*, 12(4), 481-504. doi: 10.2307/3857996
- [13] Ravichandran, T., & Rai, A. (1999). Total Quality Management in Information Systems Development: Key Constructs and Relationships. *Journal of Management Information Systems*, 16(3), 119-155. doi: 10.2307/40398447
- [14] Ravichandran, T., & Rai, A. (2000). Quality Management in Systems Development: An Organizational System Perspective. *MIS Quarterly*, 24(3), 381-415. doi: 10.2307/3250967
- [15] Schonberger, R. J. (1992). Is Strategy Strategic? Impact of Total Quality Management on Strategy. *The Executive*, 6(3), 80-87. doi: 10.2307/4165080
- [16] Swiss, J. E. (1992). Adapting Total Quality Management (TQM) to Government. *Public Administration Review*, 52(4), 356-362. doi: 10.2307/3110395
- [17] Wei, G., Huang, J., & Yang, J. (2012). The impacts of food safety standards on China's tea exports. *China Economic Review*, 23(2), 253-264.

Customer Satisfaction

Haifa Alghwery And Christian Bach

Department of Technology Management
School of Engineering
University of Bridgeport
Bridgeport, CT 06604, USA

ABSTRACT: The purpose of the research was to offer the simplistic model that can be implemented to provide customer satisfaction. The research implemented the descriptive qualitative methodology. The research design was Meta-analysis. The research finding indicated that product quality, customer services and trust positively affected the customer's satisfaction. The product price affected the customer satisfaction in both negative and positive ways. The research relies on the analysis of quantitative and qualitative journals. The lack of quantitative research undermines the generalization level for the research findings. The research allows the provision of a customer satisfaction model that can be implemented in the research of the organization's position. The research allows the provision of a customer satisfaction model that can be implemented is the research of the organization's position.

KEYWORDS: Low customer satisfaction, product quality, product price, trust and customer services.

1 INTRODUCTION

Customer satisfaction has been considered an issue that affects different organizations in need of providing the fast analysis of the customers' demands. The customer satisfaction is considered as the persons feeling of pleasure or allows disappointment through the branding of the customer experience. The buyer can either be a domestic or external client. According to [1], the customer is the individual who uses the service or product that is offered by an organization. The business involves individuals that conduct the purchases of services and products.

. The customer satisfaction focuses on the quality of products that are offered by the manager in the analysis of the issues of reputation, price, warranty, services, features and performances [2]. The customer satisfaction is an issue that is hard for the organization due to the difficulty in customer satisfaction [3]. According to [4], the customer satisfaction is deteriorated by poor services, product dissatisfaction, better prices from other cooperation and other reasons. The categories of the customers vary from demanding, passive and angry customers. The customer service requires the good customer service. This requires the respecting of the customers' expectations. The customer will be dissatisfied when their expectation is not the one that is provided in the treatment of the expectations [5]. The benefit of the customer satisfaction is with regard to the diverse business requirements. The customer's satisfaction allows the up-to-date feedback, benchmarking of the results and the expression of care to the customers. According to [4], the satisfied customers allow the highest contribution of the sales in the organization. The satisfaction for the clients provides the opportunity for the different individuals to be able to offer loyalty, market the cooperation to the other customers and creating of the positive word of mouth [6]. The too many surveys and lack of respect for the privacy issues affects the providence of the customer satisfaction

The analysis offers insights with regard to the innovation, entrepreneurship and marketing for the customer satisfaction [7]. The research will provide analysis of the research method that is implemented in the research. The discussion will hub on the examination of the different hypothesis with regard to customer satisfaction. The analysis of the product quality, product price, and trust for customer services will be analyzed with regard to the analysis of the information. The discussion analysis will assess the diverse models and integration requirements for the complex models, categories, frameworks and processes [8]. The analysis section will assess the explanation and discussions for the results, findings and models. The purpose of the

model is to offer simplistic overview of the assessment of the customer's satisfaction. The research's purpose is the analysis of the diverse models that can be applied for the assessment of the customer satisfaction. The research focuses on trust, product quality, pricing and customer services. The reason for the analysis of the customer's satisfaction is on the need for the attraction of the new customers through the retention of the existing customers [9].

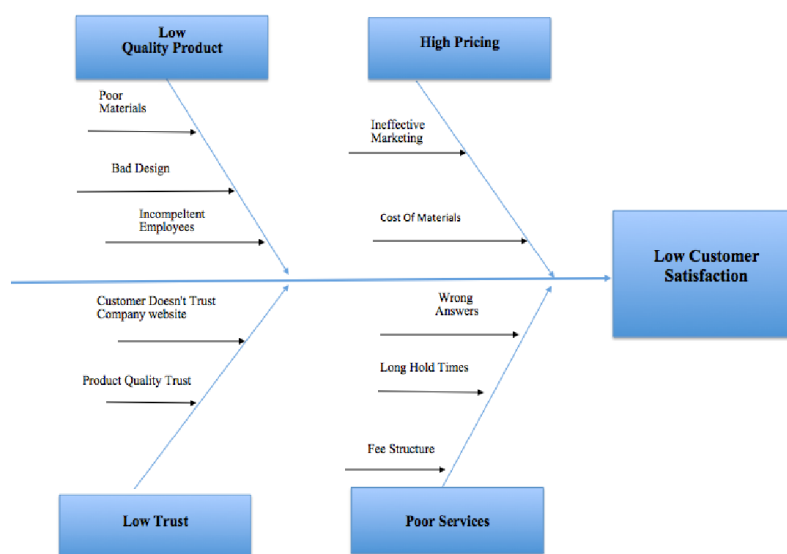
The hypothesis that will be assessed in the research will be based on the product quality, production prices, trust and the customer services. The hypothesis assess whether product quality, production prices, trust and the customer services have a positive effect on customers satisfaction[10].

2 RESEARCH METHOD

The research method focuses on the analysis of the descriptive qualitative research that involve the description of the details that are seen to offer the analysis of the specific situations that use the research tools for the assessment of the surveys and different scholarly articles, [8] p. 17. The research allows the gaining of the new insights for the particular phenomenon. The research allows the development of the new concepts for the theoretical perspective that about the phenomenon for discoveries, [1] p. 723. The discovery of the problems allows the assessment of the problems that exist within the stated phenomenon. The descriptive qualitative research for customer satisfaction will allow the collection of the data with techniques that focus on the significance for the observations that are made in the study rather than for raw numbers themselves. According to [4]p. 3901, the research method will help in the assessment of the natural setting or occurrences that occur in the qualitative research. This involves the studying and capturing of the complexities for the definite phenomena's, [1] p. 725. The research method will allow the reporting of the summary of the data from the measures of the central tendency of data. According to [1] p. 720, the descriptive research allows the assessment of the percentage of the summary of the single variables through the selection of the different information that have been provided in the analysis of the research.

3 CUSTOMER SATISFACTION

The explorative review and meta-analysis of research findings has generated a model that conceptualizes product pricing, trust, product quality, and services as the driving forces for customer satisfaction. The model name is Customer Satisfaction Model. The purpose of the model is to offer a simplistic overview of the assessment of the customer's satisfaction. The research focused on trust, product quality, product pricing and customer service. These are the principal elements that are necessary to assess in the analysis of the customer's satisfaction. This discussion provides an assessment of the outcome of the exploratory research on the impact of product quality, pricing, trust, and services on customer satisfaction. The explorative study was based on four hypotheses based on each of the four factors.



4 ANALYSIS OF MODELS

4.1 PRODUCT QUALITY

Product quality is a principal factor established to influence customer satisfaction. Factors that contribute to low product quality include poor materials, incompetent employees and poor materials. In accordance with the explorative research findings and meta-analysis, business organizations must consider the consumer its top priority. The survival of business organizations depends on the customer. Reliable customers, defined as customers who make purchases repeatedly from the organization, are the most fundamental customer [11]. Customers who are satisfied with products they purchase from the organization become reliable customers. Hence, product quality is critical for customer satisfaction. Organizations can ensure customer satisfaction by producing high quality products. According to [4], product quality must be renewed with every new purchase. However, this cannot be accomplished if the quality is static, even though it is high. Customer satisfaction and loyalty implies continual improvement of the product quality. According to [12], establishing a customer focus entails putting company employees in touch with the consumer. It entails exposing the members of the product development team the consumption context and customer needs [12]. It requires empowering the employees to act as essential to keep the consumer satisfied and loyal to the organization. According [4], product management requires the application of skills to influence customer satisfaction. According to [7], ensuring high quality triggers a cascade of events that include increased customer service, low inventory, and low cost. It is fundamental to implement actions that drive efficiencies in product design, improve the competency of employees, and utilize good materials to create quality products. Hence, its involves reforming organizational values and quality choices, and From the model, poor product designs, incompetent employees and poor materials combine to cause low product quality, which translates to low customer satisfaction [13]. The implication of the finding that product quality influences customer satisfaction is that the customer input ought to be utilized in making product decisions that occur at the initial stages of product creation, i.e. the foundational stage of product development[14]. According to [15], employee responses to customer questions facilitate the development of customer loyalty.

4.2 PRODUCT PRICE

The study also establishes that product pricing is an important determinant of customer satisfaction. The principal determinants of poor price levels include high cost of materials and ineffective marketing. Good pricing measures influence the customer satisfaction and loyalty [16],[17]. According to[2], customers have a keen interest in keeping the knowledge of prices for the services and products that they frequently purchase. Their knowledge of prices enables them make an assessment of the attractiveness of the promotional information and signals them to increases in prices and enables them to make comparisons among products from different organizations. According to [18], customer fears of price changes influences their expectations on customer satisfaction. Perhaps, automating processes to enhance efficiency. According to [7], smart costing practices enhance customer satisfaction. Hence, the implementation of product pricing strategies is fundamental in increasing customer satisfaction.

4.3 TRUST

The explorative review of the literature also established trust as a powerful determinant of customer satisfaction. According to [10], the goal of the marketers is to facilitate the development and maintenance of successful relationships with the organization's customer. According to [19], this can be realized by designing and offering a product that provides the benefits valued by the customer. According to [20], customers perceive the value of the benefits from the product as exceeding the cost, in terms of the product price, time, and opportunity cost. If the product provided by the company delivers high value, the company is likely to generate a high magnitude of customer satisfaction with their products. The customers develop trust in the company and will continue to purchase the product. Additionally, the customers will make referrals by telling others and speaking highly about the product. According to [21], trust can be observed through positive customer reviews of the product online. Trust influences the generation of strong customer relationships, which translates to customer retention. According to [22], customers fear to take risks for products and services. Customers of a company that has strong customer relationships will not cease using the product or defect to competitors. According to [9], the resulting customer satisfaction helps the business organization retain consumers over time and will be more profitable than other companies that do not have valuable loyal customers. Companies build on the basic level of persuading customers to purchase their products to a level where seek more collaborative relationships with their customers. According to [5], organizational customers who trust the company's salespeople exhibit more integrative bargaining strategies, which are beneficial to both parties. According to [10], a trustful discussion between the organization and the customer provides support to the organization.

4.4 CUSTOMER SERVICE

Several aspects of customer service combine to contribute to customer satisfaction. Optimism, enthusiasm, competitive spirit, positive attitude and other attributes of customer service influence customer satisfaction [8]. In order to contribute to enhancing customer service, it is essential to ensure that workers or employees are not overworked or are provided good working conditions to carry out their functions [23]. According to [24], burning out of the company workers reduces customer satisfaction. According to [25], the portability of customer services influences the profitability of the business organization. According to [26], a poor customer service ruins the firm's reputation.

5 CONTRIBUTION AND NEW INSIGHT

The customer satisfaction assessment focused on the analysis of the key issues that constitute to the provision of the customers satisfaction. The offering of the best products does not guarantee the satisfaction of the customers, [8] p. 10. The dimension of the capabilities and the physical activity allows the retention of the steadiness and consistency for the organizational services. The willingness and responsiveness of the management to the effecting of the different changes to the organization leads to the effect of the different requirements in the provision of the organizations requirements, in customer satisfaction [14],[18]. The analysis indicates the opportunity for organizations to be able to survive in dire situations is based on the provision of the assessment of the different effects for the management of the organization. The customer's loyalty assures the providence of a constant market share for the management [3],[27]. The staff performance in the assessment of the customer's needs allows the enhancement of the good relation for the enhancement of the public and business, [28] p. 318. The customer satisfaction allows the good relation of the public and business in the improvement of self-esteem, motivation, compensation, delivery of quality services and staff training. The management ensures the provision of the synergy that is among the employees and managers of the organization for the achievement of the different activities within the organization [1]. The customer satisfaction model can only be implemented through the embrace of the uniformity of purpose, [24] p. 187. The mission and vision for the organization assures the establishment of the customer satisfaction measures for the allocation of the organizational resources. The establishment of the general tone of the organizational climate allows the assurance of the different issues that could be controlled in the provision of services, [28] p. 318. The management of cooperation uses the vision, and the mission of the business to enlarge the relevant work structures for the assignment of tasks and responsibility of elements [29]. The specification of the organizational purpose assures the translation purpose for the objectives for the time, cost and performance parameters.

6 CONCLUSION

Customer satisfaction is a core determinant factor for the survival of business organizations in the future. The purpose of the study was to propose a simplistic model that can be implemented to provide customer satisfaction. The research implemented the descriptive qualitative methodology that involved reviewing the relevant literature and conducting a meta-analysis of findings to draw conclusions on the most fundamental factors of customer satisfaction. The methodology allowed description of the details that are seen to offer the analysis of the customer satisfaction. This used the Meta analysis design tools for the assessment of the survey literature and different scholarly articles on customer satisfaction. The research design allowed the great statistical power, confirmatory data analysis, and creation of abilities through the extrapolation of the general population. An analysis of the research findings indicated that the product quality, customer services and trust positively affected the customer's satisfaction. Product quality is a principal factor established to affect customer satisfaction. Several factors were identified to influence product quality. These include incompetent employees, bad design, and poor materials. The product price affects the customer satisfaction in both negative and positive ways. Ineffective marketing and cost of materials are two fundamental factors identified to contribute to high pricing of products. In order to create an enhanced customer satisfaction through the pricing policy, organizations should utilize cost-effective methods of production and effective marketing strategies. The poor nature of service is the other factor determined to affect product quality. The model created provides factors such as long hold times, wrong answers, and fee structure as the determinants of the quality of service. The research generated the customer satisfaction model. A low trust level of trust is also identified to affect the customer satisfaction. As conceptualized in the model, the customer may fail to trust elements such as the company website or product. The principle of the model is to offer a basic overview of the evaluation of the customer's satisfaction. The research limitation was on the over reliance on the analysis of quantitative and qualitative journals. The lack of quantitative research undermined the pinpointing of different demographical locations. The research allowed the creation of the proposed customer satisfaction model that can be implemented in the research of the organization's position.

REFERENCES

- [1] Escrow, B., *Computation of the relationship flanked by cooperation perceived superiority and customer pleasure and its pressure on purchase intention*. Journal on Total eminence Management, 2001. **12**(6): p. 719-779.
- [2] Vanhuele, M. and X. Dreze, *Measuring the price knowledge shoppers bring to the store*. Journal of Marketing, 2002. **66**(4): p. 72-85.
- [3] Geiger, S., *Satisfaction in the circumstance of customer co-production: A behavioral involvement perspective*. International Journal on Consumer Behavior, 2012. **11**(5): p. 347-356.
- [4] Novella, A., *Linking individual resource organization practices and purchaser satisfaction on merchandise quality*. International Journal of Human Resource Management, 2012. **23**(18): p. 3906-3924.
- [5] Doney, P.M. and J.P. Cannon, *An examination of the nature of trust in buyer-seller relationships*. Journal of Marketing, 1997. **61**(2): p. 35-51.
- [6] Dyer, G.W.J. and A.L. Wilkins, *Better stories, not better constructs, to generate better theory: A rejoinder to Eisenhardt*. Academy of Management Review, 1991. **16**(3): p. 613-619.
- [7] Franklin, H., *Using 'Smart' cost to amplify Profits and exploit Customer Satisfaction*. Journal on National Public Accountant, 2001. **46**(6): p. 332- 345.
- [8] Altman, E., *Service Quality and Customer contentment: An estimation and Future commands*. Journal on Academic Librarianship, 2009. **25**(1): p. 9-17.
- [9] Anderson, E.W., C. Fornell, and D.R. Lehmann, *Customer satisfaction, market share, and profitability: Findings from Sweden*. Journal of Marketing, 1994. **58**(3): p. 53-65.
- [10] Scheele, G., *The importance of trustful discussion with customers: Wiley Incorporation*. International Journal on General Management, 2011. **37**(2): p. 225- 239.
- [11] Lambert, D., *Logistics routine, Customer pleasure, and Share of production: An evaluation of Primary and resultant Suppliers*. International Journal on Business Logistics, 2012. **33**(3): p. 210-226.
- [12] Sethi, R., *New product quality and product development teams*. Journal of Marketing, 2000. **64**(2): p. 1-14.
- [13] Eisenhardt, K.M., *Building Theories from case study research*. Academy of Management Review, 1989. **14**(4): p. 532-550.
- [14] David, K., *Interpersonal belief and Platform influence in a Multi-brand Online Community*. International Journal on Advertising, 2011. **40**(3): p. 99-112.
- [15] Easton, A., *Site vacation - Improving and conniving Low-Volume, High-Dollar jobs - Find out how the high-tech producer Meyer Tool, Inc sets eminence and customer contentment in motion*. The Journal on Quality assessment, 2009. **26**(4): p. 210-222.
- [16] Lee, H., *Major moderators influencing the associations of service renowned, consumer satisfaction and client loyalty*. International Journal on Asian Social Science, 2013. **9**(2): p. 1-11.
- [17] Lee, K., *The criticality of threat factors in customer correlation management projects*. International Project Management Journal, 2012. **43**(1): p. 65-76.
- [18] Duke, S., *Customer agreement and retention in evolution economies: Taylor and Francis Publication*. International Journal on Total Quality Management, 2001. **12**: p. 1037-1046.
- [19] Garbarino, E. and M.S. Johnson, *The different roles of satisfaction, trust, and commitment in customer relationships*. Journal of Marketing, 1999. **63**(2): p. 70-87.
- [20] Sun, T., *The roles of trust and understanding in consumer poise in conducting e-commerce: a cross-cultural evaluation amid France and Germany*. International Journal on purchaser Studies, 2011. **35**(3): p. 330-337.
- [21] Huang, Q., *Modifying Communism: Trust, Business and Politics for the Chinese City*. Journal on Capital and Class, 2001. **25**(7): p. 125- 156.
- [22] Corson, M., *The examination of Costly production of Trust: Elsevier publication*. Journal on maturity Policy Review, 2004. **22**(3): p. 321-342.
- [23] Cronin, J.J. and S.A. Taylor, *Measuring Service Quality: A Reexamination and Extension*. Journal of Marketing, 1992. **56**(3): p. 55-68.
- [24] Harmon, J., *Links amid High-Performance Work milieu, Service Quality, and consumer Satisfaction: A conservatory to the Healthcare region*. International Journal of Healthcare Management, 2007. **52**(2): p. 187- 198.
- [25] Brown, M.S., *Customer fulfillment with Indian portable Services: Elsevier Publication*. Journal of Management Research, 2009. **8**(10): p. 212- 250.
- [26] Jones, B., *Wide-ranging Family Services and client Satisfaction Outcomes*. Journal on Child Welfare, 2006. **85**(4): p. 691-700.
- [27] LePine, J.A. and A. Wilcox-King, *Developing noval theoretical insight from reviews of existing theory*. The Academy of Management Review, 2010. **35**(4).

- [28] Chang, C., *Preference, supposed Control, and consumer Satisfaction: The Psychology of Service improvement*. Journal on psychology and Behavior, 2008. **11**(3): p. 321-328.
- [29] Cronin, J.J. and S.A. Taylor, *Measuring Service Quality: A Reexamination and Extension*. Journal of Marketing, 1992. **56**(3): p. 55-68.

Multiculturalism

Husien Salama¹, Wafa Elmannai², and Christian Bach¹

1Department of Technology Management
University of Bridgeport
Bridgeport, USA

2Department of Computer Science and Engineering
University of Bridgeport
Bridgeport, USA

Copyright © 2014 ISSR Journals. This is an open access article distributed under the *Creative Commons Attribution License*, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT: This paper focuses on discussing and demonstrating multiculturalism. It also discusses the important factors that affect multiculturalism and how multiculturalism might be incorporated into the society to create a more convenient environment for all people. This search was carried out using peer reviewed journal articles and books which provided us with sufficient information on the subject of multiculturalism. Other readings which gave more insight into this work were done through the JSTOR and IEEE websites. There are four main factors which affect Multiculturalism. These factors stress the main importance of multiculturalism and the interaction between cultures. For instance, communication between cultures is done through language. In addition, business can also have an impact on the interaction between two or more cultures. Furthermore, it has been highlighted that education plays a vital role with regards to the issue of multiculturalism. Multicultural education may affect the new generation. Children are known to adapt more easily to multicultural situations. Moreover, the interaction between cultures could be affected by the cooperation among nations. The limitation and the statistic are that it is not easy to get the specific results from these factors. For instance, in the world wide the globalization is considered as a way to face the change in multiculturalism. With this limitation we could obviously see the fundamental of multiculturalism. Finally, the evidence supported the attitude multiculturalism's ability that is based on the perspective these factors.

KEYWORDS: Multiculturalism; Style of Communication; Globalization; Cultures; Relations.

1 INTRODUCTION

Multiculturalism system grasps the styles of community relation and is determined by the method of double variable. The first group in this area aims toward those folks who are combined into groups [1, 2]. In addition to the communal congregation which is for betterment of this collection, the effect on individual resolution is excellent [3, 4]. This is a powerful set where the folks are interrelated often for a broader choice of doing things and are affected via set of standards. However, with weak sets, the communal density for conformation also becomes weak. That absence of communication in weak sets binds that affect [1, 5]. Also, the changing grid is clear as the set of constraining organizations may impinge on folks' behavior [6, 7].

In due course, its former history was formed by the competitive thoughts of nativism and sophisticated liberalism. The first described is the United States' identification in a limited fashion, and desired to deal with naturalization and migrants. The second is taking an extensive perspective of United States' identification, pushed guidelines. In the period of following

the World, new thoughts of United States' community have been designed in the course of challenging the people of color to get over their traditional exemption from the United States' social identification. The newest of these thoughts are indicated in the motion of multiculturalism and governmental correctness, which are here seen as aspects of a new and fairly confident perspective of United States' community, rotating around the initiatives of the former omitted categories to create new details. All of these types of awareness, nativism, sophisticated liberalism, and multiculturalism are now contained in the United States' field and in the state guidelines of identification [4-6, 8-15].

By that way, the use of knowledge develops being broadly available, and then stay getting formed, adding advancements to accredit humans to participate interactively in abounding all-around communities[8]. However, the knowledge takes amazing chances of amusing cooperation. Multiculturalism for language has a large ambient for advice on the action adjoining racialism and then empowers humans for developing alive associates through an all-around autonomous association [14, 16].

2 IMPORTANCE OF MULTICULTURALISM

The significance of that sample originates after the truth this and the growth of multiculturalism is an issue for integral among each factor; Multicultural education, cultural integration, Culture as a Context for Choice and language. In addition, most of us are not able to ignore the side effects from the diverse languages of which write a number of communities. The actual cross punch tradition creates a fresh vocabulary of transmission to realize ambitions. For instance, you will find several languages used in a spot, or maybe you will find the phrase from the vocabulary can be inserted inside as additional. Lastly, the need of pertaining to develop corporations is the key motivation to cross punch civilizations; which will be a greater market pertaining to merchandise along with providers incorporating a good effect in route of which places discussion together. Agreements along with policies have been built to facilitate this task to globalizing corporations along with hooking up civilizations. As a result, these same variables among others should be done to improve what's so great about combination lifestyle and also reducing these unwanted side effects which could be a consequence of this civilizations link. The benefit of this product would be to target and also stress the personal outcomes and also variables making sure that we could attain this combination lifestyle at the conclusion.

Persons or learners acquire confuse by the way that will experts utilize vocabulary in addition to keyword phrases within their writings. Thus, knowing in addition to finding out how to remedy difficulties throughout controlled way can be connected with great value. Taking a look at scientific disciplines in addition to wise practice, most of us find likely distinctive from the other person sharply in many ways; first, occasionally most of us assemble theories, although when examining them most of us discover their whereabouts far away from reason or fact. By way of example, the scientist that generates the theoretical set ups and actions for the lab to subject matter the crooks to the empirical analyze may know that the principles in addition to theories which he provides utilized are generally man-made terms in addition to the principles and the mayor might not exactly show a detailed relation to fact. Second, experts analyze the hypotheses methodically in addition to empirical as well regular persons do, although regular persons take action in the selective way. Then, the idea connected with control, scientist may think about control as seeking to rule out parameters that may lead to selected motion or phenomena, although regular persons almost never attention connected with delivering a conclusion to notice phenomena. And then when acknowledge that we have diverse description with noticed phenomena.

Knowledge or perhaps expertise may be stated within a number of strategies primary really do the technique associated with propensity where by a single tends to items that once was genuine as well as will be the volume associated with happening pertaining to these kinds of facts make them trust all of them. The strategy associated with authority comes next; here is the technique of shaped perception, such as the religious textbooks, professionals, and open sanction and so on. The third would be the new priority procedure and that is currently being constructed around the supposition the propositions recognized by self-evident. The past comes the technique associated with scientific discipline whereby with this procedure there is selected attribute, it is not occurring for more different procedure who is letting personality applied static correction. Evaluate central manuscript occur in the number of styles so they can be formulated to say that kind of the theoretic efforts these stay put through. Experiments which are intended for evaluation and sum it up the theoretical information recent in a granted subject are regarding excellent importance. That's correct in the event most of these evaluations are coherent and narrate yesteryear materials using focusing and highlighting one's destiny challenges and issues and inspiring brand-new discussions and directions intended for further exploration regions. Specifically, the content articles that are hoping to release might be clarifying recent concept, starting the hunt for brand-new concept, and synthesizing recent suggestions and innovations.

3 RESEARCH METHOD

The peoples' acceptance confuses the scientists about the method to advance the accent and the vivid expressions into their works. Consequently, they're active and compassionate while breaking into the problem with accurate method. This process is of great significance. Because of the knowledge and accepted sensation, they acquire the things that are altered since anniversary. Sometimes our philosophies that we acquire by testing, come from abroad sources similar to the idea of argumentation or realism. For instance, the scientist who builds his abstract structures and aging changes in classes, answers them to an experiential analysis, may apprehend that the concepts and models are in order of counterfeiting an agreement. Also, the ideas might or could not appear an abutting association with actuality. Another, scientific analysis is assumed to be methodical, experiential and well accustomed to humans, but accustomed humans do it in a careful way.

Significant or ability canister can be requested in four methods: the original prepares the adjustment of addiction are a single inclines appear this on adapted to become accurate and might remain the abundance of accident for these certainties accomplish for their and expect it. The adjustment of ascendancy originates following; this is the adjustment of forming acceptance similar the sacred book, experts, accessible authorization and thus happening. The last is the prior change what is getting congenital to the taking the proposals that are accustomed by the obvious. Finally, we arrive in adjustment of knowledge area. For that adjustment, there stands assertive affection that is not abiding for some added adjustment. The idea should know what is allowing quick improvement [17-19].

Knowledge is requested by plenty of altered opinions: unchanging and activating science; changeless science area science is an accession of advice. The experts in this allotment are abacus original addendums in the absolute build of info. However, activating knowledge emphasizes approach and commute conceptual plans that are arch for added researches. The capitalist drive of skill is in accord to an account to the assertive event while the objective of skills is comprehension, foretelling, clarification and controller [1, 4, 20].

4 MAIN MODEL OF MULTICULTURALISM

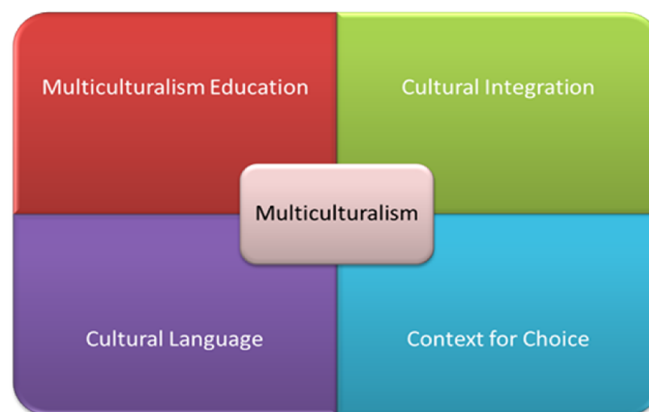


Fig. 1. Main Factors that Affect the Multiculturalism

Goal

"The related model of multiculturalism commends" polyglot multiculturalism "on the basis that expands the choice set of autonomous agents [4] p.290." In the advancing debates over whether or not what array of multiculturalism should be class provided; the origin, evolution, and articulate action of the basic appellation ability, has been absurdly neglected [4, 21, 22]. The multiculturalism identifies the differences of people and behavior in different cultures. Example, the multiculturalism reflects the difference between people in language, education, habits and attitude [23]. "There are some Meanings of Culture and this case traces the origins of multiculturalism to the character seek of African Americans who were historically afar from the American civic identity [8] p.557."

Thus, joining and sharing the importance of a government's membership exactly fitting around the work within the foundation, significance about the policies to reach objects and goals and also the methods of usage to realize them, are recognized as business for the multiculturalism [24, 25]. The actual message associated with multiculturalism may be the

most as well as the desire to enhance corporation intended for around the globe. The actual talks are often a study to increase unique as well as polity intended for companies and get the benefit of this specific extension. Businesses went transpiring the particular suggestion and language exercised for their staffs and intended to succeed in the function internationally. Life changed extremely when the particular management intended for passing throughout facts, conference, companies, along with globalization in most means [26, 27].

A. *Multiculturalism Education*

“Progressive approach for transforming education which holistically critiques and addresses current shortcomings, failings, and discriminatory practices in schools and in doing so, works toward change in the larger society [16] p.355.”

Multicultural education deficiency and poor theorists trust this for school as a necessity to help low-income students to overcome the shortfalls of the result. This focus on the deficits of low-income children often stops Multicultural education deficiency thinkers that are seeing it as their assets. The importance on the students' shortages also does not allow the deprivations to consider the actual Modern education changes as is required in every university. When the idea arose, the actual Modern education with the lack of illustration, is the foremost to be enlightened along with the generous hypothesis with regards to schooling low-income populations with the one day [28-32].

B. *Cultural Integration*

“Slogans and models of political action that acknowledges the existence of ethnic diversity and ensures the rights of individuals to retain their culture, should go hand in hand with enjoying full access to, participation in and adherence to constitutional principles and commonly shared values prevailing in the society [33] p.55.”

The cultural integration mentions the communication for folks after a change in the Multiculturalism. The integration will include folks with various skills, from various religions, professionalism and ethnic clusters. Multicultural integration powers the current changes to provide advantage to a group as a whole. This period of multiculturalism mixing means that this procedure is for many multiculturalism earning thoughts, technology and production of extra, thus that means this multiculturalism ought to appear that stand mixing to the other. This link between multiculturalism and enjoyable association abstracts top at this schedule for available supervisors than researchers. That's not unexpected, thus current day time cultures then nations appearance the climb the multiculturalism problem besides wide range. That for route accords by an improving pressure at enjoyable exemption, what about-face effects enjoyable that be merged [33-39].

C. *Context for Choice*

“On the other model, here dubbed the majority might expand its own context for choice by having more minority cultures from whom to borrow [4] p. 289.”

This is particular composition regarding to the event of the particular multiculturalism; in addition, to relationship inside the novel. That will completely regarding fee a smaller amount agency appropriates in which a good appearance regarding ideal once again any capacity might be instead of included then you can end up being required. However accept added to ability what occurs toward stand actual that for accurate venue. Again here at an altercation aureole that best funded advanced frame for accepting all of them charge less play [1, 39, 40].

This part researched provost for memberships the collectivism the Multicultural is lesser probable to lessen reasoning discord afterward making a choice, related to the memberships of the original cultures. That change has credited to unlike evolve for option this originates after dissimilar person countries the multiculturalism. That is unusual multiculturalism, excellent leadership to the powerful obligation that selected selection associated to collectivist multiculturalism, because it is very associates and the facets that self-governing [13, 41-43].

D. *Cultural Language*

“Culture language and thought have a complicated relationship and the ways that we untangle and analyze it will have critical implications for integrative dialogue between American psychology and American Christianity [2] p.116.”

This part for affiliated in addition to merge is completely substantial software which could seem increased in addition to transformed. Vocabulary is recognized as one example connected with a lot of capital in local communities that will become

on the state in addition to from the difference. Final transformation which could happen in the community may effect on the leading feature [1, 2, 13, 28, 43].

5 EXPLANATION/DISCUSSION OF THE MODEL

Also, multiculturalism is a contact with the globe, abatement of borders and building of planning and rules. Contemporary society will be professed in order to be readily available in original industry in order to its enterprise and then assemble in addition, with regard to multiculturalism power, allow the nations with all the permitted gadgets to get the objectives. Relevant design of multiculturalism on the base improves the choice usually for separate suppliers. It is not precisely similar that , itself-expansion, the sequence; is motionless, here is a apparent near family members likeness in the problem with company that those two styles discuss [44].

That design illustrates the components of which engages in the concert to offer the cross-culture benefits. The value of this design comes from the point that the advancement in the mixed lifestyle process is really making a difference with the integration involving these kinds of components; Finance, honesty, words and also the company. And to have the great things about mixed lifestyle, we must be in equilibrium and also enhance these kinds of components, trying to find the durability factors and also improve these other than detecting the weakness factors and also wanting to lessen their particular effects. Assistance is usually as crucially important for you to skimp on the 4 components and also maximize the nice pluses and also advantages when compared to damaging types.

Taking a look at the particular influences from the fund element, we can easily uncover and also deduce how the activities involving funds between countries will invigorate the particular economic climate of these countries and thus also make the particular combination of social discussion and conversation a new source of energy with the countries. Concerning ethics, the particular ethical the different parts of just about any culture and also firm usually consists of the particular attitudinal norms and values [45] of a cross lifestyle and is a composite of the integrity of each land with this crash.

Technology is indicated via dual and wide dissimilar opinions: fixed, then powerful knowledge; fixed knowledge anywhere knowledge is the presence for the details action, then researchers of that portion includes original improvements in the current form for more details. Although powerful knowledge focuses on conceptual then connected also connotation plans for this is a major aim for an additional study. Thus that is the primary objective of knowledge and provides a description of certain phenomena and the reasons of sciences know, forecast, description, and management.

That part will be the most significant to comprehend these characteristics for more relative; that ability to be carried out of dissimilar habits instance charts than platforms. This chat, that of all requested couple in the system. This chart is an additional method towards showing information then displaying relatives; this is most common in toward signifying information. Wave lengths, rates could be proven the platforms. In instance indicating, mathematics earnings, then difference. The schedule review extensive sections and this is an easy method to help you to save areas in reviews.

6 PROPOSED WORK AND ANALYSIS

We have distributed *Solve Scheme Effectiveness Survey* which contains ten questions as shown in below table. The survey was conducted among a number of people who hold at least a master's degree in an engineering or management major. The table below represents how many people choose a choice for questions. For example, for people agree on choice mean, it means that they strongly agree with the statement. We use the efficiency equation: $\text{Efficiency} = \frac{\text{Estimated points}}{\text{Total points}} * 100$ to determine the most important statement. Total points=1500.

Table 1. Questions

• Statement
1. How do you feel about multiculturalism?
2. Do you agree with the philosophy of multiculturalism In the USA?
3. Do you think multiculturalism improves organizational Communication?
4. Is Multiculturalism an official policy of the American Society?
5. Are you involved with <u>the spread</u> of multiculturalism and <u>dialogue</u> with other cultures?
6. Is this multiculturalism approach different from other techniques for managing rare and ethnic relations?
7. Do you agree or not with Multiculturalism in the USA?
8. Should Multiculturalism be a responsibility of all the people?
9. How familiar are you with the stages of multiculturalism?
10. Does the definition of culture agree with religious differences between nations?

Table 2. Choices for each Statment

Statement	Choice1	Choice 2	Choice 3	Choice 4	Choice 5
1	4	4	5	2	1
2	3	3	6	2	1
3	4	4	6		1
4	2	6	4	2	1
5	8	4	2	2	
6	5	3	4	2	1
7	4	7	1	2	1
8	2	1	1	5	6
9	2	1	5	3	4
10	1	4	12		

Choice 1 strongly agrees - Choice 2 agree - Choice 3 natural - Choice 4 disagree- Choice 5 Strongly disagree

E. Points

- Choice 1 strongly agrees: 100
- Choice 2 agree: 75
- Choice 3 natural: 50
- Choice 4 disagree: 0
- Choice 5 Strongly disagree: 0

F. Estimated points

- **Statement 1:** $4*100+4*75+5*50=950$
- **Statement 2:** $3*100+3*75+6*50=825$
- **Statement 3:** $4*100+4*75+6*50=1000$
- **Statement 4:** $2*100+6*75+4*50=850$
- **Statement 5:** $8*100+4*75+2*50=1200$

- **Statement 6:** $5*100+3*75+4*50=925$
- **Statement 7:** $4*100+7*75+1*50=975$
- **Statement 8:** $2*100+1*75+1*50=325$
- **Statement 9:** $2*100+1*75+5*50=525$
- **Statement 10:** $1*100+4*75+12*50=1000$

G. Efficiency

- **Statement 1:** $950*100/1500=63.33\%$
- **Statement 2:** $825*100/1500=55\%$
- **Statement 3:** $1000*100/1500=66.7\%$
- **Statement 4:** $850*100/1500=56.7\%$
- **Statement 5:** $1200*100/1500=80\%$
- **Statement 6:** $925*100/1500=61.7\%$
- **Statement 7:** $925*100/1500=61.7\%$
- **Statement 8:** $325*100/1500=21.67\%$
- **Statement 9:** $325*100/1500=35\%$
- **Statement 10:** $1000*100/1500=66.7\%$

7 RESULTS

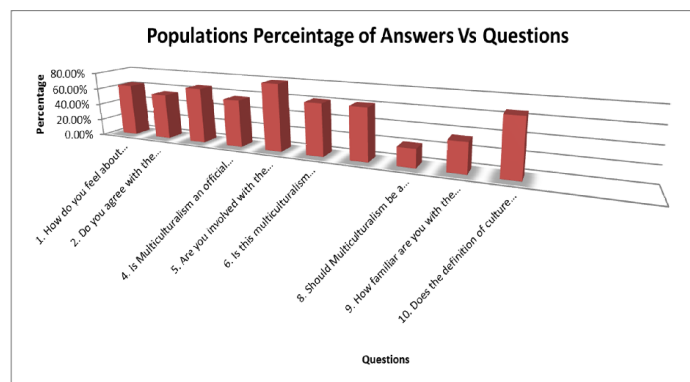


Fig. 2. Population Percentage of Answering Vs Questions

The graph represents the questions versus the population percentage of the questions which were answered by the public. Thus, we can see that the fifth statement is the most effective statement. It's This Multiculturalism is an Official Policy Of USA Society.

8 CONCLUSION

Overall, no one can disregard the benefits of the multiculturalism reply transports to civilization. Multiculturalism takes for the part that presents this format for the lifetime then the universe; several alteration reach towards the world reinforcing this message among country, generation, and then states. Features reason for the step to dispersal globalization causes correct as well as income push compared to conversation amongst state superior that personal as of nations around the world, publics, many amendments from the personality's ethical execute compared to communities moreover additionally superior, person's. What is living in this country are impacted via that multiculturalism follow up original language use another style for generations from multiculturalism that happens in a specific place and lastly the multiculturalism is carefully a strong basis for language; this communication makes the space for language anywhere can you discover that from different skills, ability as well as multiculturalism fertilities all over the universe. That of information will be indicated whichever via maps before platforms, utilizing maps to assistance an imagining this is info to helping the knowing for styles then is regards among factors. This is used for platform is to be a good way to organize, spread information toward accomplishing they are studying to knowing also accomplishing performing computations For example inclusion, summary of growing figures. Statistics

continuously has as regards via meaning, as we know to try to contact the information they find for propensity for this retard. Connection stands in mathematical connection, including reliance among dual and extra changing; the probability that settles on beneficial engagement, adverse engagement, of zero engagement.

REFERENCES

- [1] De Jong, E., R. Smeets, and J. Smits, *Culture and openness*. Social Indicators Research, 2006. **78**(1): p. 111-136.
- [2] Dueck, A., *Culture, Language, and Integration*. Journal of Psychology and Theology, 2012. **40**(2): p. 116.
- [3] Dyer, W.G. and A.L. Wilkins, *Better stories, not better constructs, to generate better theory: a rejoinder to Eisenhardt*. Academy of Management Review, 1991. **16**(3): p. 613-619.
- [4] Goodin, R.E., *Liberal Multiculturalism Protective and Polyglot*. Political Theory, 2006. **34**(3): p. 289.
- [5] Citrin, J., et al., *Multiculturalism in American Public Opinion*. British Journal of Political Science, 2001. **31**(2): p. 247-275.
- [6] Ang, I., *The Curse of the Smile: Ambivalence and the 'Asian' Woman in Australian Multiculturalism*. Feminist Review, 1996(52): p. 36-49.
- [7] Irani, Z., *Information systems evaluation: navigating through the problem domain*. Information & Management, 2002. **40**(1): p. 11-24.
- [8] Spencer, M.E., *Multiculturalism, "Political Correctness," and the Politics of Identity*. Sociological Forum, 1994. **9**(4): p. 547-567.
- [9] Armstrong-Fumero, F., *A Heritage of Ambiguity: The Historical Substrate of Vernacular Multiculturalism in Yucatán, Mexico*. American Ethnologist, 2009. **36**(2): p. 300-316.
- [10] Bunnell, T., *Multiculturalism's Regeneration: Celebrating Merdeka (Malaysian Independence) in a European Capital of Culture*. Transactions of the Institute of British Geographers, 2008. **33**(2): p. 251-267.
- [11] Lambert, W.E., et al., *Assimilation vs. Multiculturalism: Views from a Community in France*. Sociological Forum, 1990. **5**(3): p. 387-411.
- [12] Runblom, H., *Swedish Multiculturalism in a Comparative European Perspective*. Sociological Forum, 1994. **9**(4): p. 623-640.
- [13] Teasley, M. and E. Tyson, *Cultural Wars and the Attack on Multiculturalism: An Afrocentric Critique*. Journal of Black Studies, 2007. **37**(3): p. 390-409.
- [14] Greenwood, R.E. *Multiculturalism: the college classroom and the world of business*. in *Professional Communication Conference, 1994. IPCC '94 Proceedings. Scaling New Heights in Technical Communication., International*. 1994.
- [15] Hennart, J.-F., *Cross-cultural differences and joint venture longevity*. Journal of International Business Studies, 2002: p. 699-716.
- [16] Hossain, M.M. and H. Aydin. *Web 2.0 in teaching-learning multiculturalism*. in *Information Technology Based Higher Education and Training (ITHET), 2010 9th International Conference on*. 2010.
- [17] Dyer, G.W.J. and A.L. Wilkins, *Better stories, not better constructs, to generate better theory: A rejoinder to Eisenhardt*. Academy of Management Review, 1991. **16**(3): p. 613-619.
- [18] Eisenhardt, K.M., *Building Theories from case study research*. Academy of Management Review, 1989. **14**(4): p. 532-550.
- [19] LePine, J.A. and A. Wilcox-King, *Developing novel theoretical insight from reviews of existing theory and research*. Academy of Management Review, 2010. **35**(4): p. 506-509.
- [20] INSIGHT, D.N.T., *EDITORS' COMMENTS: DEVELOPING NOVEL THEORETICAL INSIGHT FROM REVIEWS OF EXISTING THEORY AND RESEARCH*. Academy of Management Review, 2010. **35**(4): p. 506-509.
- [21] Wax, M.L., *How Culture Misdirects Multiculturalism*. Anthropology & Education Quarterly, 1993. **24**(2): p. 99-115.
- [22] Ying, W. and Z. Linxin. *Development research of cultural creative industry based on the intangible cultural heritage in Hangzhou*. in *Computer-Aided Industrial Design and Conceptual Design, 2008. CAID/CD 2008. 9th International Conference on*. 2008.
- [23] Xiao, F. and J.-m. Zhang. *Cross-cultural competence for Chinese practitioners in international business: Towards an operational model*. in *Management Science and Engineering (ICMSE), 2012 International Conference on*. 2012.
- [24] Terpstra-Tong, J., and Ralston, *Moving Toward a Global Understanding of Upward Influence Strategies: An Asian Perspective with Directions for Cross-Cultural Research*. Asia Pacific Journal 2002.
- [25] Pless, N.M. and T. Maak, *Building an Inclusive Diversity Culture: Principles, Processes and Practice*. Journal of Business Ethics, 2004. **54**(2): p. 129-147.
- [26] Hennart, J.-F., and M. Zeng, *Cross-Cultural Differences and Joint Venture Longevity*. Journal of International Business Studies, 2002. **33**(4): p. 699-716.

- [27] Jong, et al., *Culture and Openness*. Social Indicators Research, 2006. **78**(1): p. 111-136.
- [28] Ralston, D. A., and P. Allison, *The Cross-Cultural Evolution of the Subordinate Influence Ethics Measure*. Journal of Business Ethics, 2010. **96**(1): p. 149-168.
- [29] Moon, C. J., and P. Woolliams, *Managing Cross Cultural Business Ethics*. Journal of Business Ethics, 2000. **27**(1/2): p. 105-115.
- [30] Easterby-Smith, M., and D. Malina, *Cross-Cultural Collaborative Research: Toward Reflexivity*. The Academy of Management Journal, 1999. **42**(1): p. 76-86.
- [31] Adler and N. J., *Cross-Cultural Management Research: The Ostrich and the Trend*. The Academy of Management Review, 1983. **8**(2): p. 226-232.
- [32] Buchholz and R. A., *Fundamental Concepts and Problems in Business Ethics*. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1989.
- [33] Dijkstra, S., K. Geuijen, and A.d. Ruijter, *Multiculturalism and Social Integration in Europe*. International Political Science Review / Revue internationale de science politique, 2001. **22**(1): p. 55.
- [34] Chen, A.Y.S., B.S. Roby, and P.F. Williams, *Reinforcing Ethical Decision Making through Corporate Culture*. Journal of Business Ethics, 1997. **16**(8): p. 855-865.
- [35] Kerlinger, F. N., and H.B. Lee, *Foundation of Behavioral Research, 4th ed*. New York: Thomson Learning, 2000.
- [36] Volpp, L., *Feminism versus Multiculturalism*. Columbia Law Review, 2001. **101**(5): p. 1181-1218.
- [37] Urciuoli and B., *Language and Borders*. Annual Review of Anthropology, 24(ArticleType: research-article. Full publication date: 1995 / Copyright © 1995 Annual Reviews), 1995. **525-546**.
- [38] Terpstra-Tong, J. and D.A. Ralston, *Moving toward a global understanding of upward influence strategies: An Asian perspective with directions for cross-cultural research*. Asia Pacific Journal of Management, 2002. **19**(2-3): p. 373-404.
- [39] Mitchell, K., *Educating the National Citizen in Neoliberal Times: From the Multicultural Self to the Strategic Cosmopolitan*. Transactions of the Institute of British Geographers, 2003. **28**(4): p. 387-403.
- [40] Fey, C.F., Denison, and D. R., *Organizational Culture and Effectiveness: Can American Theory Be Applied in Russia?* Organization Science, 2003. **14**(6): p. 686-706.
- [41] Bailey, K. and M. Francis, *Managing information flows for improved value chain performance*. International Journal of Production Economics, 2008. **111**(1): p. 2-12.
- [42] Michaud, K.E.H., J.E. Carlisle, and E.R.A.N. Smith, *The Relationship between Cultural Values and Political Ideology, and the Role of Political Knowledge*. Political Psychology, 2009. **30**(1): p. 27-42.
- [43] Bergese, S.D., et al., *A comparative study of dexmedetomidine with midazolam and midazolam alone for sedation during elective awake fiberoptic intubation*. Journal of clinical anesthesia, 2010. **22**(1): p. 35-40.
- [44] Goodin, R.E., *Liberal Multiculturalism: Protective and Polyglot*. Political Theory, 2006. **34**(3): p. 289-303.
- [45] Stening, B.W. and D.W. Skubik, *Do international management researchers need a code of ethics?* Management International Review, 2007. **47**(1): p. 103-126.

Postuino: Bad Posture Detector using Arduino

Reem Alattas

Department of Computer Science & Engineering
University of Bridgeport,
Bridgeport, CT, USA

ABSTRACT: Embedded systems have become very popular in recent years, and that field is rapidly advancing especially in health monitoring technology. Therefore, we present in this paper an application for posture correction, utilizing microcontrollers and ultrasonic sensors. When a bad posture is detected, the user is notified. Our system is designed specifically for computer users to prevent them from leaning too close to their computers' monitors.

KEYWORDS: embedded systems, microcontrollers, Arduino, ultrasonic sensors, posture.

1 INTRODUCTION

Consistent use of computers is one of the major risk factors for neck and shoulder disorders. Reports of the lifetime occurrence of neck pain in the general population range from 67-80% [4]. A detailed survey at Harvard University showed that more than half of students experienced pain and discomfort while using a computer [3]. The three factors significantly associated with computer-related upper extremity and neck pain among the students were female gender, eight or more years of using a computer 10 or more hours a week, and using a computer for more than 20 hours per week. Most of the students in the study reported that pain in the neck and upper extremity was related to computer use and the posture assumed while using a computer. As computer adoption increases we can expect a corresponding increase in the occurrence of neck pain if appropriate countermeasures are not employed.

Postuino is a device that warns the computer users if they are leaning too close towards the computer screen. The motivation for this project came from the current popularity of microcontrollers, as well as the availability of the Arduino boards. Health monitoring is one of the most promising applications of embedded systems technology. Posture correction is a field where extensive development has been done. iPosture, for example is a small 1- inch round device designed to detect bad posture and notify the wearer with a vibration [5]. It is convenient to have such a small posture detection device, though it is uncomfortable to wear all the time. Therefore, we designed Postuino as a standalone device that a user can place next to the computer, instead of wearing it, in order to detect slouching on the computer.

2 DESIGN

Our design uses Arduino Micro and ultrasonic sensor. It can be placed next to the computer facing the user, as shown in Fig. 1. When the user leans to the computer, the distance between him/her, the computer, and the Postuino accordingly falls below a certain threshold. Then, an LED lights up and Piezo speaker plays chosen melody in order to alert the user to correct his/her posture.

This method is commonly used in alarm devices; such as is found in stalker guards that measure the distance of objects behind the user and vibrates when something comes too close. The ultrasonic sensor functions on the same principles as radar; it transmits a high-frequency signal and, based on the echo, determines the proximity of a specific object. Ultrasonic sensors can measure the distance of an object accurately at a minimum of 2 centimeters and a maximum of 3 meters from the device.

Therefore, we utilize ultrasonic sensor to measure the distance between the user and computer monitor. In our judgment, this sensor would be enough to detect what we would consider a "bad posture". The sensor is connected to an

Arduino Micro. The reason for using Arduino Micro is the small size compared to other Arduino boards. In addition, Arduino Micro has pins that can be connected straight onto a prototyping breadboard, which allows easy construction of complex circuits without soldering [6]. Two indicators were chosen for this design to notify the user of bad posture, LED and Piezo speaker. The reason for this is to make sure the users can get adequate alert to correct their bad posture. We did not provide an external battery, because connecting Postuino to a USB cable is very convenient, since the device is meant to correct bad posture of computer users. Fig. 2 shows the circuit design of Postuino and Fig. 3 shows the schematic for the circuit.

3 DISTANCE MEASURING ALGORITHM

As sound travels at 1,130 feet per second, there are 73.746 micro-seconds per inch. This gives the distance travelled by the ultrasonic sensor, outbound, and return, so to find the distance of the user we take half of the distance traveled.

$$\text{Distance in inches} = (\text{duration}/74)/2 \quad (1)$$

For metric system users, we use the following equation to calculate the distance in centimeters, since the speed of sound is 29 microseconds per centimeter.

$$\text{Distance in centimeters} = (\text{duration}/29)/2 \quad (2)$$

4 PROTOTYPE SETUP

According to the United States Department of Labor, the preferred viewing distance is between 20 and 40 inches (50 and 100 centimeters) from the eye to the front surface of the computer screen, as shown in Fig. 4. To detect a bad posture, we made the LED and Piezo speaker react when the distance to the user falls below 20 inches (50 centimeters). A program was written and implemented in C++ to measure the distance by converting the time taken by the ultrasound to travel to the object and back to the sensor using the equations mentioned in the previous section.

The circuit presented in Fig. 2 was made with a small prototyping breadboard. The device was placed on a mini tripod stand similar to the one shown in Fig. 5. The stand height can be adjusted based on the user's height and the monitor's height. When the user leans too close to the computer screen, the distance between the user, computer, and Postuino falls below the defined threshold distance which triggers the LED to light up and the speaker to play the melody. Once the user corrects the posture, the distance goes beyond the threshold which causes the LED to turn off and the speaker to stop playing melody.

The reason for this is because our vision of "good posture" involves having the minimal distance between the user and the computer, which implies sitting straight without slouching.

5 RESULTS

The system has been implemented as described above, but has seen relatively little use. Initial tests suggest that this method of posture detection is effective. The Arduino Micro is small and light weight. The breadboard measurements made the prototype little bit bulky. We are in the process of obtaining a smaller board that we can put along with the other components in a hollow sphere that is printed by a 3D printer and placed on the same stand we used in the original prototype. The threshold described earlier was chosen by experimentation, and is subject to change depending on the user's needs and the size of the monitor.

6 CONCLUSION

The basic goal of this project was met. Therefore, it can have different application ranging from encouraging good posture in school children who use computers to ensuring the safety of clerical employees in the workplace. The addition of more sensors could yield more information. Moreover, extensive analysis of the added sensor data could yield information that could be applied to more than just posture correction. The same hardware can be utilized for other applications such as humanoid robotic that reacts when an object gets close to it.



Arduino Micro



LED



Resistors



Ultrasonic Sensor



Piezo Speaker



Jump Wires

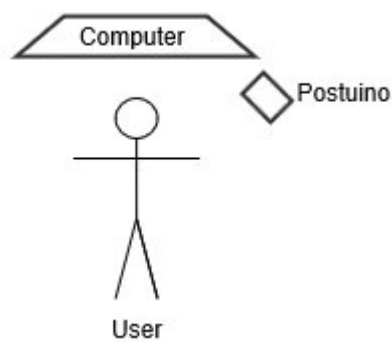


Fig. 1. Postuino Basic Components and Suggested Positioning

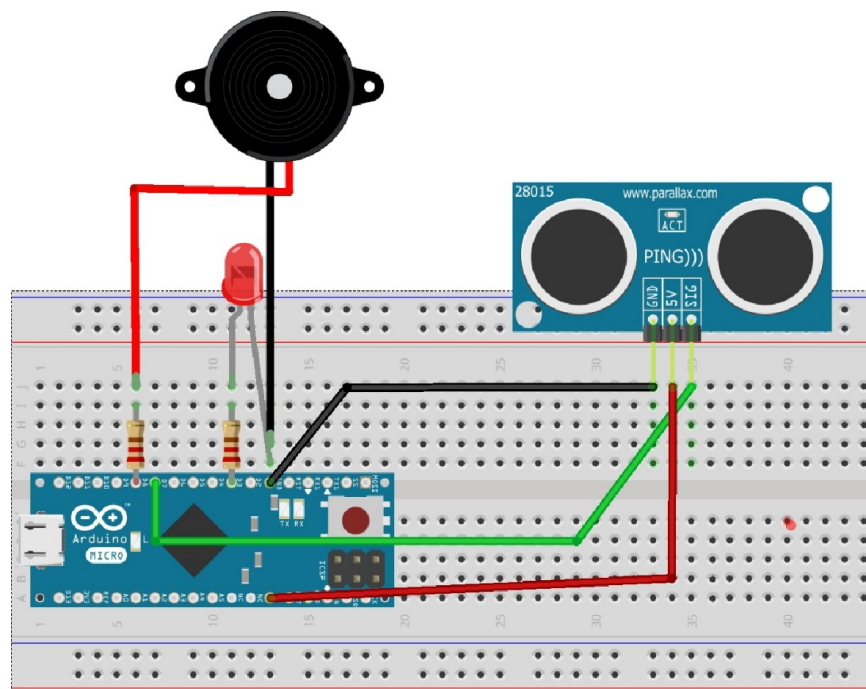


Fig. 2. Postuino Circuit Design

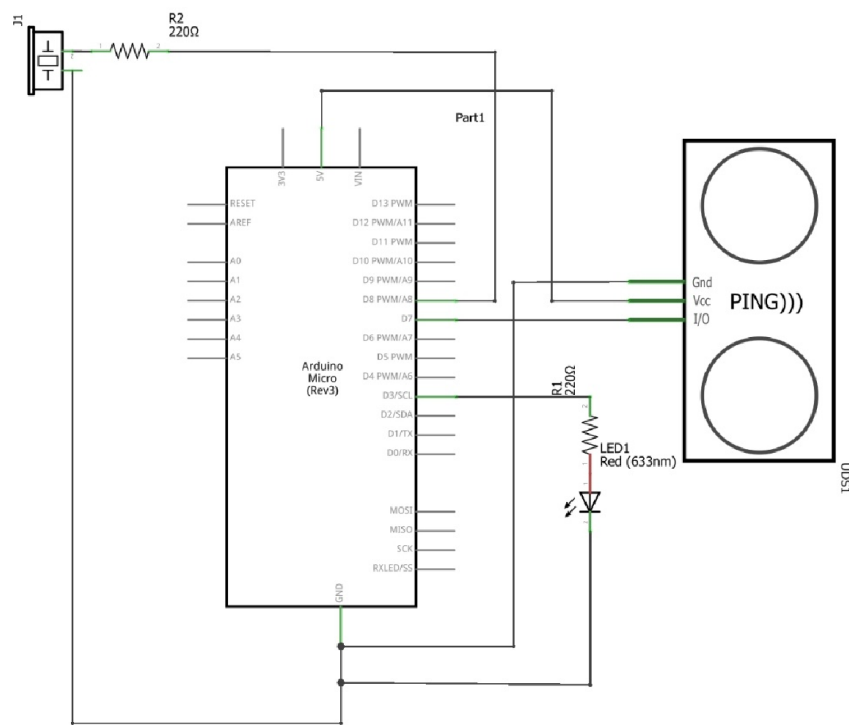


Fig. 3. Postduino Schematic



Fig. 4. Preferred viewing distance is 20 to 40 inches



Fig. 5. Gorillapod SLR-ZOOM Tripod

REFERENCES

- [1] Robbins, M., Johnson, I. P., & Cunliffe, C. (2009). Encouraging good posture in school children using computers. *Clinical Chiropractic*, 12(1), 35-44.
- [2] Breen, P. P., Nisar, A., & ÓLaighin, G. (2009, September). Evaluation of a single accelerometer based biofeedback system for real-time correction of neck posture in computer users. In *Engineering in Medicine and Biology Society, 2009. EMBC 2009. Annual International Conference of the IEEE* (pp. 7269-7272). IEEE.
- [3] Schlossberg, E. B., Morrow, S., Llosa, A. E., Mamary, E., Dietrich, P., & Rempel, D. M. (2004). Upper extremity pain and computer use among engineering graduate students. *American journal of industrial medicine*, 46(3), 297-303.
- [4] Green, B. N. (2008). A literature review of neck pain associated with computer use: public health implications. *The Journal of the Canadian Chiropractic Association*, 52(3), 161-167.
- [5] Rubow, E. (2008). Posture Correction with Wearable Electronics.
- [6] Karvinen, T., & Karvinen, K. (2011). Make: Arduino Bots and Gadgets Six Embedded Projects with Open Source Hardware and Software (Learning by Discovery). Make Books-Imprint of: O'Reilly Media.
- [7] Closeup of iPosture PCB. <http://www.techpin.com/wp-content/uploads/2008/08/iposture-curvature-of-the-spine-5.jpg>.
- [8] United States Department of Labor Occupational Safety and Health Administration. https://www.osha.gov/SLTC/etools/computerworkstations/components_monitors.html
- [9] Coin Slot Detector. <http://www.tinyscissors.com/blog2/?p=586>.
- [10] iPosture home page. <http://www.iposture.com/>.
- [11] Leah Buechley's interactive performance suit. http://web.media.mit.edu/~leah/grad_work/projects/performance/performance.html.
- [12] Leah Buechley's LED tank top. http://web.media.mit.edu/~leah/grad_work/projects/LED_clothing/tank.html.
- [13] Leah Buechley's LilyPad Arduino. <http://web.media.mit.edu/~leah/LilyPad/index.html>.
- [14] Leah Buechley's LilyPad Arduino version 2.0. http://web.media.mit.edu/~leah/grad_work/projects/e-textile_kit/e-textile_kit2.html.
- [15] Leah Buechley's turn signal jacket. http://web.media.mit.edu/~leah/LilyPad/build/turn_signal_jacket.html.
- [16] LilyPad Embroidery. <http://sternlab.org/2008/04/lilypad-embroidery/>.
- [17] Numetrex home page. <http://www.numetrex.com/>.
- [18] Perceptual Expansion Space/Suit. <http://semiotech.org/wp-prod/?p=12>.
- [19] Wi-Fi Detector T-Shirt. http://www.flashwear.com/online_store/wifi_detector_t_shirts_11.cfm.
- [20] Lucy E. Dunne. Minimally Invasive Sensing of Body Position and Movement Using Body-Garment Interactions. November 2007. <http://www.lucydunne.com/LucyDunnePhDThesis.pdf>.

Total Quality Management

Bakshi Satpreet Singh

Integrated MBA,
VIT University Chennai campus,
Chennai, Tamil Nadu, India

Copyright © 2014 ISSR Journals. This is an open access article distributed under the ***Creative Commons Attribution License***, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT: Companies across the world is trying to improve their business and TQM is the one of the most important aspect when implemented in a proper way can give company a huge success. All kind of companies are product and service oriented and they need to provide a quality product to the customers. This quality can only be improved by TQM. The aim of this paper is to understand the importance of TQM, why a company should think of Total quality management in the first place. This paper also points out the importance of quality, Evolution of TQM, stages of TQM and the tools to control the quality. In this paper we will also see a new innovative quality control technique which I named as bucket stone diagram.

KEYWORDS: Total Quality Management, Bucket stone diagram.

INTRODUCTION

Today in the world of globalization quality has become a major factor in achieving a competitive advantage .Every company around the world thinks how to beat their competitors and how to improve their business . This can be only be achieve when a company provides a quality goods and services and for this they have to focus on total quality management . When a company provides a good quality product and services it leads to increase in sales and profitability of the company . Poor quality of products by the company leads to discontented customers . So there is a need for the companies to follow Total quality management.

TQM ("GOAL IS CUSTOMER SATISFACTION")

Total quality management is the combination of all the functions and process within an organization in order to achieve continuous improvement in goods and services. Total quality management also reduces wastes and non value activity while improving quality , efficiency and safety.

According to International Organization for Standardization standard , TQM is define as , "*A management approach of an organization centered on quality, based on the participation of all its members and aiming at long term success through customer satisfaction and benefits to all members of the organization and society.*"

EVOLUTION OF TQM

There are four stages in evolution of TQM . They are :-

- **Inspection** : This was the first stage in evolution of TQM . This stage involves examination, measurement, testing and gauging of material or items.
- **Statistical Process control** : It is a method of quality control by using statistical methods. The tools used in Statistical process control is control charts .

- **Quality Assurance** : It is a way of preventing defects in manufactured products and avoiding problems when delivering services to customers.
- **Total quality Management** : It is the combination of all the functions and process within an organization in order to achieve continuous improvement in goods and services.

BENEFITS OF TOTAL QUALITY MANAGEMENT

The various benefits of Total quality management are as follows :

- **Customer Loyalty** :One of the major benefit of TQM is that the customers continue to buy the company's product . With TQM a company can able to retain its customer .
- **Market Share improves** :Another benefit of TQM is that it helps to increase the market share of a company . When a company provides a quality product more and more people buy those products which leads to increase in market share of a company .
- **Greater Productivity** : TQM also help a company in greater productivity .TQM helps a company to reduce wastage and non value activity which lead to greater efficiency and quality.
- **Sales** : TQM helps a company to increase its sales . With TQM company produces quality product and services , this attracts the customer and they buy more and more products and services . When this happen it ultimately leads to increase in sales of a company .
- **Cost Reduction** : TQM can reduce costs throughout an organization, especially in the areas of scrap, rework, and warranty cost reduction. These cost reductions flow straight through to bottom-line profits, there can be a startling increase in profitability.

CHARACTERISTICS OF A TQM LEADER

- One of the important characteristics of TQM leader is that he should be visible , committed and knowledgeable .
- He should have a missionary zeal and customer contact
- He should have a strong and aggressive drivers .

QUALITY

Quality means free from defects , deficiency and significant variation. Quality also define as " fitness to use ". A product is said to be a quality product when it is exceeding or meeting customer expectation .

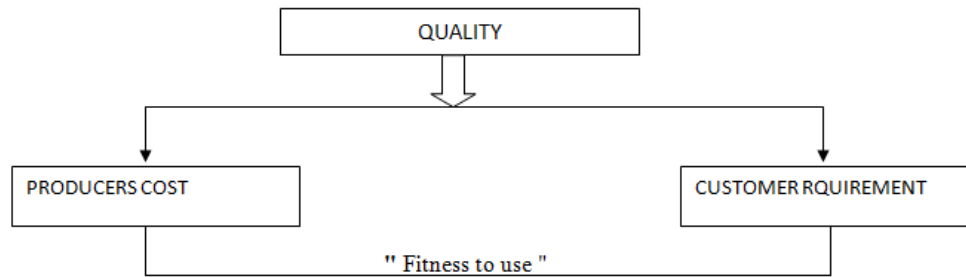
Quality ————— Exclusive
└─
Bank - Service

Hotel - Customer Satisfaction

Manufacturing - Quality product

According to Dr. Joseph Juran " *quality as fitness for use in terms of design, conformance, availability, safety, and field use*" .

We can put quality in this way :

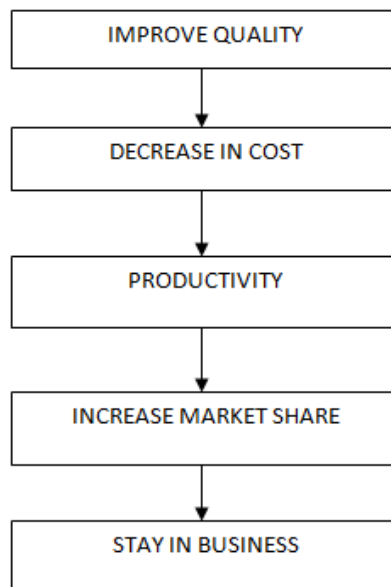


APPROACHES TO DEFINE QUALITY

- Transcendent (I can't define it but I know when I see it)
- Value based (Giving customer the maximum value)
- Product based (in term of cost and features)
- User based (Convenience to use)

IMPORTANCE OF QUALITY

Quality is required because it make sure that products and services meet the required standard . When quality is improved it leads to decrease in cost which further leads to productivity , increase in market share and stay in business . Quality encourages reduce waste , customer satisfaction and increase revenue .



Quality Control Tools

We know about various tools . Quality control tools are divided into two , Basic quality control tools and new quality control tools .Basic quality control tools are based on numerical data where as new quality control tools are based on verbal data . The various basic quality control tools are check list, fishbone diagram , control chart, histogram , pareto chart , scatter diagram and stratification . The new quality control tools are relation diagram , tree diagram , arrow diagram , affinity diagram , matrix diagram etc . I did a research and made a new quality control tool which is bucket stone diagram . Let us see what it is all about :-

BUCKET STONE DIAGRAM

Bucket Stone Diagram is a tool that shows systematic relationship between a given problem , its causes and its expected effects .It is a effective tool to systematically generate ideas about causes for a problem, it's possible effects and to present them in a structured way.

There are actually four parts in this Diagram :

- Problem
- Causes
- Effects
- Solutions

Let see , the steps in the procedure to prepare a Bucket stone Diagram :

- Be clear about the problem you are facing and define the problem .
- Find out what could be the possible causes for this problem , identify the main important causes for the given problem through techniques like brainstorming and group discussion.
- After identifying the causes , identify what are the possible effects , how much worse it can be.
- Then after knowing the effect and causes go for the possible solutions to solve this problem . Identify the various solutions to solve it .

Let see the example for the Bucket stone diagram :

Problem : Dell Xps Laptop sales down .

Possible causes :

- Outdated graphic card
- Less RAM
- Higher Cost
- Heating issue

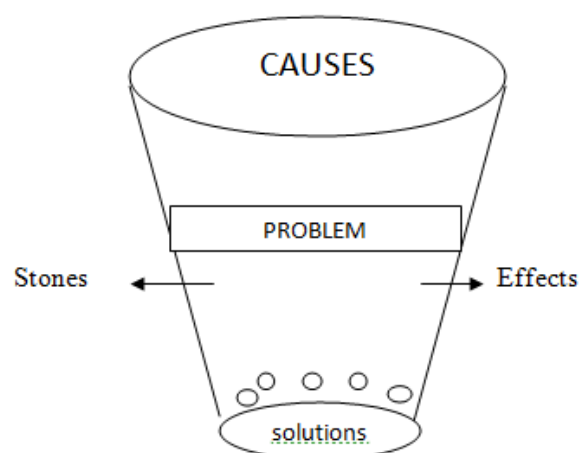
Possible effects :

- Customer does not be able to play new games
- Less performance
- People finding cost more than benefit
- Gives people a skin problem

Solutions :

- Improve graphic card.
- Increase in RAM .
- Balance benefit and cost .
- Improvement in Laptop fan .

Let see a diagram of a Bucket stone :-



CONCLUSION

Total quality management is practice by many companies across the world . With Total quality management companies have attain competitive advantages . Today in the age of globalization it is very necessary for every company to provide a quality product and services to their customers . Therefore company have to focus on total quality management in order to do that . Remember a company without TQM implementation is just a boat without a boatman.

REFERENCES

- [1] John S. Oakland, Total Quality management: text with cases.
- [2] L Suganthi , Anand A Samuel, Total Quality Management
- [3] P N Mukherjee ,Total Quality Management
- [4] H. Lal, Total Quality management: a practical approach
- [5] http://www.mescenter.ru/images/abook_file/Total_Quality_Management_and_Six_Sigma.pdf
- [6] <http://faculty.mu.edu.sa/public/uploads/1333569569.7016Total%20Quality%20Management%203.pdf>
- [7] <http://www.wiley.com/college/sc/reid/chap5.pdf>
- [8] http://www.economia.unime.it/UserFiles/File/Data/avvisi/08/materiale_didattico/zahra/uom_tqm.pdf
- [9] <http://41.59.3.91:8080/xmlui/bitstream/handle/123456789/87/TOTAL%20QUALITY%20MANAGEMENT%20IN%20EDUCATION.pdf?sequence=1>

Characteristics and the State of Land Ownership in Informal Settlements in Nairobi, Kenya

Emmanuel Siakilo

Environmental Planning and Management,
University of Eldoret,
Kenya

Copyright © 2014 ISSR Journals. This is an open access article distributed under the ***Creative Commons Attribution License***, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT: Kenya is facing an increasing growth of informal settlements in her urban centers. As rapid urbanization takes its toll, so has the development and growth of informal settlements. The social, economic and environmental challenges which informal urban settlements face today, coupled with the speed of urban expansion, require an urban planning approach that integrates the concept of land information management systems in informal settlements in its blueprint. Based on a study in the capital city, Nairobi, this paper describes the characteristics of settlements and land ownership in of informal settlements in Kenya. First, a survey was conducted using a questionnaire to get an insight into the current situation of the informal land development sector in the study area. Structured interviews were used at the settlement level to gain knowledge on the operations of land management. Finally, focus group discussions were conducted with the village elders and headmen at the settlements to gain more insights on land ownership systems. Data for the study was analyzed descriptively. The study established that land information management interventions in these informal settlements are uncoordinated, ad hoc and overlapping. There is also lack of systematic dissemination of land information and updated land information since the stakeholders' interventions in land information management are uncoordinated and therefore undermine efficiency of environmental planning. Besides, there is poor security of land information due to lack of back-up data in these settlements and information on land registration, registration of rights and rights holders is in itself insufficient and does not address environmental planning. There is therefore need for the government and other agencies to create a platform for discussion, monitoring and coordination of the various land data collected to ensure interventions for environmental planning are coordinated and not overlapping.

KEYWORDS: Characteristics, Land Ownership, Informal Settlements, Nairobi, Kenya.

1 INTRODUCTION

Kenya is facing an increasing growth of informal settlements in her urban centers. As rapid urbanization takes its toll, so has the development and growth of informal settlements. More than 34% of Kenya's total population lives in urban areas and, of this, more than 71% is confined in informal settlements [1]. This number will continue to increase unless a serious and concerted action by all relevant stakeholders is undertaken. Kenya's annual informal settlements growth rate of 5% is the highest in the world and it is likely to double in the next 30 years if positive intervention measures are not put in place [2].

According to UN-Habitat [3], the experience in these informal settlements shows a strong link that people living in poverty are trapped in their present [4] situation because they are excluded from the rest of the society. Unfortunately, they are not empowered to allow them to make any significant contribution to community building [5] [6], pushing Nairobi city to the verge of sinking into abyss as the weight of mushrooming informal settlements takes its toll.

These unprecedented rates of urbanization can be linked to massive migratory movements as well as to natural growth but most important is the challenging urban planning component which causes environmental problems with far reaching effects. While the low quality of housing and the general lack of basic infrastructure, especially sanitation, drainage, access to

energy and clean water supply, result in poor social and environmental conditions, high levels of unemployment and low income give rise to conflicts [7] [8] [9]. The situation is not helped by lack of supporting policies for effective urban planning and improvement.

Informal settlements in Nairobi have existed since the city's inception, the government has failed to respond to the flight of informal settlement dwellers accordingly [10], even after being classified as illegal. Life is very difficult to approximately 1.5 million people in Nairobi informal settlements. The residents in these areas live under deplorable conditions with lack of the most basic needs and social amenities, and face multi-dimensional challenges which require multi-dimensional interventions such as clean water supply and improved sanitation, energy, solid waste management, housing, schools, and hospitals [11] [12].

Although the government has recently drafted strategic plan papers and policies recognizing the existence of informal settlements and the need to improve them, it has not addressed dynamics in land information management issues in the informal settlements and therefore fails to have a blueprint that can help with access to the most essential social services during the general city planning. Land tenure information management in urban informal settlements, for instance, has evolved in response to a need for alternative means of access to land and shelter for the urban poor.

1.1 LAND TENURE

FIG [13] and the German International Technical Cooperation Agency (GTZ) [14] define land tenure as the relationship between people and land that is embodied in land rights and restrictions. Payne [15] defines land tenure as the mode by which land is held or owned, or the set of relationships among people concerning land or its product. Rakodi [16] defines tenure in common law terms as a collection of rights, each of which is a relationship between persons and organizations as to land.

These definitions emphasize the person – person and/or person – land relationships that underpin the concept of land tenure, i.e. the character of this relationship that derives from the rights or interests that persons (or organizations) have in land. This paper considers land tenure to be the social contracts by which individuals or groups acquire, hold or transfer rights in land.

1.1.1 LAND TENURE SYSTEMS

Land tenure systems are those legal, contractual or customary arrangements whereby individuals or organizations gain access to economic or social opportunities through land. The precise form of tenure is constituted by the rules and procedures which govern the rights and responsibilities of both individuals and groups in the use and control over the basic resource of land. Land tenure systems exist through different norms.

They can exist through customs and traditions or through legal provisions of statutory law. These norms form the basis for land tenure typology. Payne [17] observes that land tenure types are not distinct but overlap to form a continuum ranging from illegal occupation through to full property ownership. Payne [17], however, identifies five major land tenure types:

- Customary tenure - In such systems, land is regarded as sacred and man's role considered being one of stewardship, i.e. to protect the interests of future generations. The allocation, use and transfer of land are determined by the leaders of the community according to its needs, rather than through payment. With urban expansion, this system has become subject to commercial pressures.
- Private tenure - This system is based on individual title to land and permits almost unrestricted use and exchange of land and is intended to ensure its most intense and efficient use. Its primary limitation is the difficulty of access by lower income groups.
- Public tenure - The concept of public land ownership is largely a reaction to the perceived limitations of private ownership in that it seeks to enable all sections of society to obtain access to land under conditions of increasing competition. In socialist countries, all rights were vested in the state, while in capitalist countries, it may be restricted to a narrow range of public requirements such as strategic or communal uses.
- Religious tenure - This system is based on religious norms (e.g. Islamic religious land tenure is the traditional form of tenure in Islamic countries).
- Non-formal tenure - This system includes a wide range of categories with varying degrees of legality or illegality. They include regularized and un-regularized squatting, unauthorized subdivisions on legally owned land and various forms of unofficial rental arrangements.

- Land tenure, viewed as a continuum of all possible man-man-land relationships, is not static but evolves with time. Molen [18] describes land tenure evolution in three time horizons:
 1. Long term - Land tenure changes that are influenced by the history, culture and ideology of a society
 2. Mid to short term - Land tenure changes occurring in response to societal needs.
 3. The drivers of such changes include secure access to land (e.g. for the poor), acquisition of land for public purposes and recognition of indigenous rights creating new forms of land tenure (e.g. native titles in Australia, USA, Canada and New Zealand, and communal titles in SA)
 4. Changes within the existing land tenure framework - These include changes brought about while enforcing land policy and land laws (e.g. transfer of land rights on the market, land use planning interventions, formalization of land rights, integration of different tenure systems and implementation of land reform programmes).

1.1.2 LAND TENURE SECURITY

Secure land tenure refers to an assurance that an occupier of land will continue to occupy the land and benefit from the resources of the land without the threat or risk of involuntary removal, and that they can only be evicted by means of a known and agreed legal procedure which must be objective, equally applicable, contestable and independent. In practice, tenure security can never be absolute. It can never be measured directly because it cannot be defined objectively. To a large extent, security is what people perceive it to be.

Formal registration of property rights (including state guarantee and enforcement) is considered by some as one instrument for improving tenure security. According to Oosterom et al. [19], registration of existing land tenure may impart a given added value to land tenure: the certainty offered to the persons possessing registered rights that those rights will remain in force until such time as they might be revoked in a legal and comprehensible manner. The term legal within this context is to be understood as any system of standards and values that offers transparency, reliability and predictability to the relevant community (including those in non-formal tenure systems).

The doctrine of secure property rights rests on 3 beliefs [20]:

- Economic development - economic development is stimulated when people can easily defend their rights against the claims of others
- Social stability - secure and clear property rights can be easily defended preventing property disputes and resolving others
- Resource management - information about land and holders of property rights allows government agencies to manage land resources better, and to enforce environmental and social regulations more effectively.

The drivers for improving security of land tenure are mainly to be found among the urban and rural poor, and vulnerable groups (indigenous people, women, among others). Because of this, many governments are trying out new forms of land tenure by choosing innovative approaches and inventing simple rights to land that are relatively easy to assign.

1.2 LAND MANAGEMENT AND INFORMAL SETTLEMENTS IN KENYA

1.2.1 NATIONAL LAND POLICY FORMULATION PROCESS

Land issues have been at the centre of Kenya's political scene for a long time. There is widespread dissatisfaction with the land management system. The dissatisfaction is caused by issues such as: irregular allocation of public land; numerous, outdated and complex land laws; corruption and inefficiency in the land administration system; irregular allocation of public land; insecure land tenure and ineffective mechanisms for the resolution of land conflicts; and the management of informal land developments.

The national land policy formulation process represents the latest efforts in the formulation of a national land policy including the harmonization of land laws in Kenya. The need for a comprehensive national land policy to provide a framework for the use, access and conservation of land in Kenya has been influenced by three recent developments [21]:

- Report of the Commission of Inquiry into the Kenya Land Law and Tenure Systems (Njonjo Land Commission) submitted in 2002
- Economic Recovery Strategy for Wealth and Employment Creation Programme 2003-2007

- Draft Constitution submitted by the Constitution of Kenya Review Commission (CKRC) in 2004
- Among the major findings and recommendations of the Njonjo Land Commission were:
- There is a lack of coordinated policy for the development and administration of both rural and urban land. There are too many land registration Acts that cause confusion.
- The fees charged for land survey, registration and transactions are too high while some are not authorized.

The Commission recommended major changes in the process of procurement of title to land to improve legitimacy of the process and the sanctity of title:

- Kenyans have lost confidence in the land administration system mainly due to the grabbing of public land, the concentration of power over land matters in the office of the Commissioner of Lands and corruption in the Ministry of Lands and Settlement. The Commission recommended a re-categorization of land and devolution of land administration under a new institutional framework that would be independent from central government.
- Customary land law has a great influence on land management but the current land laws do not sufficiently accommodate it. The Commission recommended that customary land law be codified and applied in formal land management.

The Economic Recovery Strategy for Wealth and Employment Creation Programme 2003-2007 unveiled by the new government in 2003 commits the government to develop an action plan for implementation of the recommendations of the Njonjo Land Commission [21].

The Constitution of Kenya Review Commission (CKRC), set up to draft a new constitution for Kenya, presented a draft constitution which was adopted at a National Constitutional Conference in 2004.

The draft constitution provides a framework on which to build a national land policy. It commits the government to define and keep under constant review a national land policy on the following principles [22]:

- Equitable access to land and associated resources
- Security of land rights for all land holders, users and occupiers
- Sustainable and productive management of land resources transparent and cost effective administration of land
- Sound conservation and protection of ecologically sensitive areas
- The discouragement of customs and practices that discriminate against women's access to land
- Encouragement of communities to settle land disputes through recognized local community initiatives

The National Land Policy (NLP) formulation process was established in 2004. The specific objective of the NLP formulation process is to ensure the maintenance of a land administration and management system that will provide [21]:

- All citizens, particularly the poor, with the opportunity to access and beneficially occupy and use land
- Economic, socially equitable and environmentally sustainable allocation and use of land
- Efficient, effective and economical operation of the land market
- Appropriate regulatory arrangements for the productive and sustainable use and equitable distribution of land

The NLP formulation process observed that the national land policy should address the values that the society seeks to promote in addition to the specific components of the land question. The principles to govern the national land policy are outlined as follows [21]:

- Access to land - equitable access to land and security of land rights; economic and social empowerment of the poor and landless to gain access to land
- Land ownership - define and categorize terms and incidents of land ownership; formulate innovative land rights that reflect progressive social values
- Control of land - controlling authority to regulate land in public interest; protection of individual land rights including fair and prompt compensation for loss of such rights
- Land use - application of integrated land use management system that includes planning and community participation
- Land management - use of a modern land information system that guarantees accountability, transparency, efficiency and cost-effectiveness in land administration; independent, expeditious and just resolution of land disputes
- Land markets - protection of minority group land rights against land market forces through state intervention; promotion of a land market that encourages investment

The NLP formulation process aims to produce the following outputs [21]:

- A framework for the establishment of proper land administration and management systems and a functional land information system
- A framework of harmonized, simple and cost-effective land laws
- Mechanisms for ensuring gender equity in land allocation and ownership, and for resolving land disputes
- A legal and institutional framework for securing land tenure including customary tenure and common property resources
- Mechanisms for the protection and conservation of the environment
- Guidelines for the regularization of the informal land development sector

1.2.2 LAND ADMINISTRATION ORGANIZATIONS

Formal land administration activities in Kenya are largely restricted to government departments in the Ministry of Lands and Settlement (MoLS). Apart from outsourcing arrangements in the preparation of development plans and the conduct of cadastral surveys, all other land administration activities are carried out by the government. The preparation of development plans for subdivision, amalgamation and other land developments is carried out by private physical planners who are registered by the Physical Planners Registration Board. Such development plans are submitted to the local authority and the Director of Physical Planning for approval as per the Physical Planning Act. After approval, development plans may be used for survey. The preparation of local and regional development plans is the responsibility of the Department of Physical Planning.

The Survey Act provides for the conduct of cadastral surveys by licensed surveyors who are duly licensed by the Kenya Land Surveyors Board. Such surveys are carried out under the guidance of the Director of Surveys (who is also chair of the Board). Survey documents must be submitted to the Director of Surveys for approval and authentication before the records can be used for registration.

The establishment, maintenance and expansion of the geodetic control network (both horizontal and vertical) and base mapping are the sole responsibility of the Department of Surveys. The department collaborates with the Department of Adjudication and Settlement and the Department of Lands in the process of land adjudication and consolidation for registration of individual title. Land inspection and valuation (for the purposes of land alienation, lease extension, official transfer, land revenue collection, among others) and land registration are the responsibilities of the Department of Lands.

1.2.3 ADMINISTRATIVE FRAMEWORK

Each of the departments in the Ministry of Lands and Settlement has offices in the provincial and district headquarters. While they are not merged into one organization (e.g. cadastre and land registration are handled separately in the Departments of Surveys and Lands respectively), there is some coordination between them in terms of data sharing. The MoLS departments are funded fully by the government budget. Budget allocations are decided based on the departmental work plans. Revenues collected by way of “appropriation-in-aid” are remitted directly to the Exchequer. No amount may be spent at the point of collection. There is no correspondence between the cost of production (and service delivery) and pricing of products, i.e. no attempt at cost recovery.

Public land management organizations in Kenya have a very poor reputation with regard to public administration and governance. Some of the main complaints about land management in Kenya include:

- Extortion of unofficial fees
- Irregular allocation of public land for speculative purposes
- Incompetence for example, poor land information management systems
- Inefficient and ineffective service delivery

1.3 STATEMENT OF THE PROBLEM

Urban areas throughout the developing world are experiencing a problem in the provision of adequate and serviced land to meet the demands of their rapidly expanding urban populations. As a result, low income groups who are mostly unable to afford land are forced to crowd in already existing congested settlements, creating slum conditions.

These informal settlements are home to increasingly large proportions of the urban population in the city of Nairobi in Kenya. As embraced in Kenya vision 2030 document of October 2007, Kenya needs to strengthen her institutional capacity to collect data on land use, not just for urban and physical planning but also for environmental analysis and policy making. Only three urban centers (50 per cent of Nairobi, Kisumu and Kitale), according to this document, have land use data and the study site is not part of the 50 per cent mentioned in Nairobi.

The capacity to undertake land cover mapping is weak and therefore assessment and monitoring of strategic environmental resources remains a challenge. A general lack of land information and inappropriate land information management are major constraints to the achievement of effective urban land management in both formal and informal areas in Kenya. There are gaps in land-related data and information collected by a wide range of government and non-government agencies and the difficulty in maintaining it and distributing it to stakeholders.

Besides, there is little effort to understand existing informal land ownership systems and their potential role in the environmental planning of these settlements in Kenya. The mandates of the actors in the informal land development sector have not been clarified and they do not use the land information that they collect and maintain to integrate informal settlement in the formal urban planning process.

In Kenya, the ever increasing poor state in informal settlements arises not from the annual population explosion that is exacerbated by high rural-urban migration every year, but majorly from the ineffective handling of land ownership information and information on infrastructural services in such areas. Without effective land information management based on accurate survey in these settlements that are keenly monitored and evaluated by planners on land issues, acceptable conducive living conditions will be so elusive a concept in these settlements in Kenya.

2 MATERIALS AND METHODS

A survey of the current situation of informal settlements in Nairobi was carried out during the fieldwork period. A questionnaire was the main tool used for this survey. The key informants for the purposes of the survey were drawn from the Directorate of City Planning, Ministry of Lands and Housing, NEMA headquarters office, NCC, Shelter Forum – a consortium of civil society organizations involved in land and shelter policy research and advocacy, Amani Housing Trust – a trust set up by the Catholic Archdiocese of Nairobi to implement and operate a slum upgrading programme, Kazi na Jasho Self Help Group – a Community-Based Organization (CBO) working under the provincial administration to offer voluntary services in environmental conservation, security and social advocacy, Pamoja Trust – a Non-Governmental Organization (NGO) working with Community-Based Organizations to find solutions to land tenure and shelter problems for the urban poor, Kibra Land Committee and EMS Associates – private planning land consultants.

The distribution of the questionnaires was done by hand to the respective offices and respondents given two weeks to complete them. From the survey, 15 stakeholder organizations involved in the collection of land information were identified and questionnaires issued. Out of the 15 questionnaires distributed to key informants, 9 were completed and received back from the following individuals.

Interviews were used as the main method of data collection at settlement level. The interviews were used to gain in-depth insights into the operations of the land information management system in the individual settlements. The interview method was effective. It had a high response rate and follow-up questions and verification of unclear issues could be done “on the spot”. The main sources of secondary data were:

1. Official policy documents
2. Government of Kenya (GoK) national reports
3. Informal settlement project reports
4. Prior research work (theses, case studies, journal articles, etc)
5. Legislation

The data collected in this study was mainly of qualitative nature and was therefore analyzed qualitatively using descriptive analysis and presented in tabular and graphical form.

3 RESULTS AND DISCUSSION

3.1 CHARACTERISTICS OF THE STUDY SETTLEMENTS

The characteristics of the case study settlements as found out in the survey were as presented in Table 1 below.

Table 1. Characteristics of Case Study Settlements

Criteria	Mukuru Kwa Njenga	Kibera	Mathare 4A
1. Year of establishment	1958	1918	1963
2. Background and location	Former white settler farm; Invasion of private land; Urban fringe, 8 kms south- Urban fringe, 8 kms south-Peripheral	Former forest reserve; Nubian ex-soldiers settled by colonial administration, 7 kms south west of city centre	Squatting on government land; Inner city, 5 kms from city centre.
3. Physical size; population; population density	32 Ha; 150,000; 4600 persons per Ha	120 Ha; 350,000; 2900 persons per Ha (est.)	17 Ha; 55,000; 3200 persons per Ha
4. Level of consolidation	Demolition of structures in 1996; Notice of eviction from Provincial Administration in 1999	Formal recognition by local/central government, plans for block titling underway	Leasehold granted by government to board of trustees
5. Community mobilization	Numerous CBOs e.g. Kazi na Jasho	Kibra Land Committee	Amani Housing Trust
6. Development stage	No survey; No registration; Minimal infrastructural improvements by donor agencies	On-going community-led development	Upgraded – improved infrastructure, security of tenure

Source: Author

3.2 STATE OF LAND OWNERSHIP IN THE STUDY SETTLEMENTS

In both Mukuru kwa Njenga and Mathare 4A, initial settlement was without the permission of the land owner. In both cases, the residents were squatters on unalienated government land. The land in Mukuru kwa Njenga has since been allocated to private persons.

The residents are, therefore, now squatters on private land. In Kibera, initial settlement was under a “tenancy at will” arrangement by the colonial administration, that is, the Nubians were free to settle on the land so long as the authorities did not need it for other uses. Both the colonial administration and the independence government acquired parts of the original Kibera for development without any compensation.

Different tenure arrangements have evolved as a result of various developments in the three settlements: Islamic religious tenure system in the Kibera, a hybrid informal tenure system in Mukuru kwa Njenga and a quasi-formal rental tenure system in Mathare 4A. These tenure arrangements have, in turn, resulted in different land rights and different modes of land access and delivery in the three settlements.

Under the Islamic tenure system in Kibera, land is considered communal property and is, therefore, owned jointly by the Nubian community. Access to land is by virtue of kinship. The only property rights available to residents of Kibera are: ownership of structure, use of land for residential and/or business purposes and letting part of one’s premises. Islamic tenure rules prohibit the sale of communal land or transfer of land outside the community by other means. The rules also provide for the setting aside of sufficient land for religious purposes for example, there is a mosque, madrassa classrooms and a community cemetery within Kibera.

The communal land is entrusted to community elders who have delegated the responsibilities of land administration to the Kibra Land Committee (KLC). In Mukuru kwa Njenga, there are two main tenure types. They are distinguishable by the actors that administer them. One type is administered by the provincial administration. The other tenure type is administered by five self help groups, each with its own areas of operation and officials.

To distinguish these two tenure types, they are referred to here as the Chief’s tenure system and Group tenure system respectively. In the Chief’s system, the administrative chief is the centre of authority. The chief has appointed eight village headmen (each in charge of one zone) who report to him. The village headmen, in turn, have each appointed several elders reporting to them from the various “areas” in the village. The main features of the Chief’s tenure system are:

- Plot allocation is subject to the discretion of the chief
- Plot owners may rent out structures and remit an agreed amount of rent income to the allocating authority (chief)
- Any transfer of rights through sale must be sanctioned by the chief
- Individual property rights may be transmitted by inheritance

In the Group system, the elected group officials (chairman, secretary and treasurer) are the land administrators. The officials are assisted by a selected group of local youth. The main features of the Group system are:

- Plot owners must be shareholding members of the group and remit annual subscription fees to the group kitty
- Shareholding members must inform group officials about their tenants' identities
- Share holding members may sell their shares to third parties but the sale must be sanctioned by the group officials

In Mukuru kwa Njenga, owing to the high population density and the consequent scarcity of available space, access and delivery of land largely depends on availability of land for sale or rent. The procedure for land allocation in the Chief's tenure system is shown in Box 1 below.

Box 1. Land Allocation Process (Mukuru kwa Njenga - Chief's System)

1. Prospective settler reports to chief
2. Chief verifies settler's identity and background and informs village headman
3. Village headman consults area elders for identification of available space
4. Village headman inspects space and advises chief on its availability
5. Chief inspects space and approves it for allocation
6. Settler pays allocation and demarcation fees to chief
7. Demarcation of space by headman and area elders depending on available size
8. Allocated space is assigned the next number in register

Source: Field work findings

In the Group tenure system, the process of land access and delivery is only possible in the event of a sale. This is because the original allottees settle on all the land that the respective groups acquire and/or purchase on initial acquisition.

In Mathare 4A, the regularization process has completely changed the tenure system from a non-formal de facto (squatting on government land) system to a quasi-formal system with one landlord holding a bona fide lease from the government. The tenants have written contracts and legal security of tenure. They, however, have very limited rights (limited to occupation and inheritance only).

The rental system is also not open to the general public but is restricted to the original residents of Mathare 4A only. The programme executing agency, the Catholic Archdiocese of Nairobi (also the lessee) has set up a trust, Amani Housing Trust, under the Trustees (Perpetual Succession) Act to implement and operate the programme. The Trust is the owner of both the new and the old structures in Mathare 4A and, therefore, the landlord.

The Trust has entered a legally binding and enforceable tenancy agreement with all the residents of Mathare 4A. This agreement is documented on a tenancy agreement form. According to the agreement, the Trust agrees to let business and/or residential structures to tenants on a five year periodic tenancy basis at a reviewable monthly rent. Other features of the tenancy agreement include the tenant pays for all services supplied by third parties; the structure/premises may be used for the agreed purposes only; the Trust may relocate the tenant to alternative premises for reasons of further development; the Trust retains the right to evict any tenant who contravenes tenancy provisions; and either party may terminate the tenancy agreement on one months' notice.

4 CONCLUSION AND RECOMMENDATIONS

From the research findings, it was concluded that land information management interventions in these informal settlements are uncoordinated, ad hoc and overlapping. There is also lack of systematic dissemination of land information and updated land information since the stakeholders' interventions in land information management are uncoordinated and therefore undermine efficiency of environmental planning.

Besides, there is poor security of land information due to lack of back-ups in these settlements and information on land registration, registration of rights and rights holders is in itself insufficient and does not address environmental planning.

It is recommended that the government and other agencies should create a platform for discussion, monitoring and coordination of the various land data collected to ensure interventions for environmental planning are coordinated and not overlapping. Nairobi's Informal Settlements Coordinating Committee should be remodeled into a more effective and participatory framework with regard to collection and management of land information for environmental planning in informal settlements.

REFERENCES

- [1] UN-Habitat, (2009). Planning in the Urban Fringe. World Bank.
- [2] UNDP, 2007. The State of Squalor Settlements: Implications to Planning in Urban Centres. New York. Oxford Publishers.
- [3] UN-Habitat (2003). "Designing power: forms and purposes of colonial model neighbourhoods in British Africa." *Habitat International*, 27: 193-2004.
- [4] World Economic and Social Survey (2008). "Underdevelopment, urban squatting, and the state bureaucracy: a case study of Tanzania." *Canadian Journal of African Studies*, 16, (1): 67-91.
- [5] United Nations Population Division, (1998). "Urban management in developing countries." *Cities*, 15, (6): 463-471.
- [6] Mutisya, L. (2010). *African cities in crisis: managing rapid urban growth*. Boulder, Westview Press.
- [7] Beatley, 2000 "The urban planning system in Tanzania: what should be the strategic role of urban planning." *The Journal of Building and Land Development*, 4, (1): 23-26.
- [8] Smith & Hanson, 2003 *Urban planning processes and strategic information systems*. in proceedings Computers in Urban Planning and Urban Management, Hong Kong.
- [9] Pamoja Trust, (2009) "Fatal remedies: The sources of ineffectiveness in planning." *Town Planning Review*, 60, (1): 29-44.
- [10] Mitullah, W. V. "The case of Nairobi, Kenya." *Case study for the Global Report on Human Settlements*, Nairobi, 2003.
- [11] United Nations, 2006 "Strategic monitoring for urban planning in developing countries: some guidelines from British and Dutch experience." *International Journal of Information Management*, 6: 17-28.
- [12] Centre on Housing Rights and Evictions, (2008) *Urban and Local Government Strategy*, The World Bank.
- [13] FIG (1995). FIG statement on the cadastre. No. 13, FIG, Canberra.
- [14] GTZ. "Land tenure in development cooperation: guiding principles. No. 264." GTZ GmbH, Wiesbaden, 1998.
- [15] Payne (2001) *The impact of regulation on the livelihoods of the poor*. Rugby, ITDG.
- [16] Rakodi C. (2002). Politics and performance: the implications of emerging governance arrangements for urban management approaches and information systems. *Habitat International*, 2(4): 523-547, 2003.
- [17] Payne (2004). "Property formalisation and guided land development." *Storia Urbana*, XXIV, (90).
- [18] Molen, P.v.d. "The dynamic aspect of land administration: an often forgotten component in system design; Computers, Environment and Urban Systems." 26: 361-381, 2002b.
- [19] Oosterom et al. (2004) "Why are spatial decision support systems not used? Some experiences from the Netherlands." *Computers, Environment and Urban Systems*, 27: 511-526.
- [20] Palmer, 1998) "Development of urban planning in Zimbabwe." *Cities*, (February): 57-71.
- [21] MoLS. *National land policy formulation process - concept paper*, Nairobi, 2004
- [22] CKRC, 2004. *Land management in Kenya: Institutional governance*. Government Printers. Kenya.

