



Research Article

© 2020 Emad Mohamad Al-Zoubi.
This is an open access article licensed under the Creative Commons
Attribution-NonCommercial 4.0 International License
(<https://creativecommons.org/licenses/by-nc/4.0/>)

Quality of Life and Its Relationship with Cognitive Flexibility among Higher Education Students

Emad Mohamad Al-Zoubi

*Al-Balqa Applied University/
Princess Rahma University College, Jordan*

DOI: <https://doi.org/10.36941/jesr-2020-0075>

Abstract

The study aimed to inspect the quality of life (QOL) and its relation with cognitive flexibility among higher education students according to gender, accumulative average, and academic year. The study sample consisted of (325) students enrolled in Al-Balqa'a Applied university. Two scales are used to achieve study purposes, QOL scale and cognitive flexibility scale. The study outcomes indicated that there are statistically significant differences in QOL (quality of health and time management) among students due to the gender in favor to male students, there are no statistically significant differences in QOL (quality of social and family life, education and learning, emotional life, and mental health) among students due to gender, and there are statistically significant differences in QOL (quality of health, education and learning, emotional life, mental health, and time management) among students due to accumulative average. Furthermore, the results found that there is a positive statistically significant relationship between QOL (overall scale) and cognitive flexibility (overall scale), there is a positive statistically significant relationship between adaptive cognitive flexibility and QOL (quality of health, social and family life, education and learning, emotional life, mental health, and time management), and there is a statistically significant relationship between spontaneous cognitive flexibility and dimensions of QOL (quality of health, education and learning, mental health, and time management), while there is not a statistically significant relationship between spontaneous cognitive flexibility and dimensions of QOL (social and family life and emotional life).

Keywords: *Quality of life (QOL), Cognitive flexibility, Higher education students.*

1. Introduction

Quality of life (QOL) is a thought-evoking research subject. This term associates with positive psychology. Research subjects in this context are various and numerous, including self-experiences, habits, positive personality traits, and all aspects evocate person life enhancing. Various studies asserted that the light side of human personality is more conspicuous compared to the dark side. Positive psychology concerns the strength points of humanity, luxury, and pleasure (Sheldon & King, 2001). Thus, there is a notable concentrating on the strength psychological points of humans capable to promote growing up healthy such as the study of traits and positive feelings (Bast, 2008).

1.1 Literature Review

The definition of quality of life is diverse and varied among authors. Rogdan and Taylor (1990) defined quality of life as an individual's sense of contentment about his life fatality and feels

happiness and convenience. Similar to Moorjani & Geryani (2004), who defined QOL as satisfaction sense of the individual in various life aspects mainly in the most important aspects to him. Good (1990) defined QOL as an opportunity acquisition to achieve meaningful objectives. According to the World Health Organization-WHO- (1995), QOL is an individual's recognition of his assigned social value in the terms of affiliating surrounding culture and values in his association with objectives, expectations, and interests.

Schalock (2000) argued that Quality of life is not about an individual's contentment of what he has in life, to go further as life circumstances that individual desires, and its connection to eight elements of his life emotional happiness, personal relationships, financial welfare, personal developments, physical well-being, self-directedness, social security, and social rights.

QOL is a divergent concept comprises numerous elements that Corr (2004) listed in the health condition, the capability of performing daily activities, work, entertainment, relationships with others, free time utilization, prosperity, enjoyment sensible experience, and positive advantages. Seed & Lioyed (1997) added the acquisition of educational opportunities, chosen and decision-making abilities, social responsibility, effective communication, and productivity.

Quality of life concept significantly associates with various labeling, mostly two terminologies welfare and well-being, in addition to the development of various choices like human rights and knowledge as necessities to life, welfare growths due to the cognitive and scientific developments, enhancement, gratification and comfort due to demands fulfillment, secure once demands and motivations are satisfied, and poverty (such as income poverty, economic inequality, and lack of human developments that strain the best utilization of human and financial resources simultaneously) (Suliman, 2010).

Felace and Perry (1995) introduced a QOL model in which subjective and objective indicators are integrated into all life aspects and individuals. This model comprises five elements, which are physical well-being, financial welfare, social welfare, emotional health, well growth, activity, and vitality.

From the psychological perception, it considered QOL as a comprehensive constitute consists of various variables that aim to fulfill the demands of individuals living in life, these variables can be measured by subjective and objective indicators. Other authors claimed that the core of life is about demands fulfillment as a key component of quality of life, based on Maslow's theory of demands fulfillment. Theory classifies human demands into five classes, which are psychological demands, security demands, belonging demands, self-esteem, and self-actualization. Hence, whatever the individual transfers to the new growth phase, new demands and needs of this phase must be fulfilled. In turn, an individual feels the necessity to cope demands of a new phase in which satisfaction will exhibit if demands are fulfilled, or dissatisfaction will exhibit if demands are not fulfilled as a result of level availability and appropriate demands of life quality (Elian, 2014).

Quality of life includes delight of things accumulatively, comprehends human subjective and capabilities, occupationally and actively accomplishes an individual's ambitions and interests enabling him to overwhelm life challenges, and determines meaning and objective that he always pursue to achieve delicately. As well as the enjoyment of financial conditions within the external environment, well-being feeling, meet needs, life satisfaction, grasp an individual's power and life's meaning, physical well-being, and sense of happiness to live life conveniently and hormonally with human core and common value of the community (Al-Shrafi, 2012).

Studies in life quality indicated that there are various relationships combined QOL and several variables like emotional intelligence, social skills, psychological flexibility, mindfulness, etc. Cognitive flexibility is one of the variables correlated with QOL. Since, cognitive flexibility has a primary role in an individual's adaptive capability with the variant psychological, social, and psychical environments. Furthermore, cognitive flexibility facilitates guidance behavior toward objectives. It is linked to plenty of psychological processes and executive functions such as feeling organization, self-organization, solve problems, and decision-taking (Dajani and Uddin, 2015). It was noticed that weak cognitive flexibility is prevalent among people with emotional disorders and depression risks

(Murphy et al., 2012; Snyder, 2013; Trivedi and Greer, 2014).

The concept of cognitive flexibility presents the mental competence to adapt cognitive processing strategies to cope with new and unexpected circumstances in the surrounding. The concept also conveys the ability to exchange between two different terms and tackles numerous terms simultaneously. Consequently, it refers the transformation from task to another or from behavior to another according to the circumstance since cognitive flexibility depends on sedulity to acquire new behavioral patterns differ from old patterns awkward in such uncertain circumstance. Cognitive flexibility exhibits definitely whenever the individual is capable to determine special choices regards particular condition and develop frequently sufficient responses to deal with dynamic environment demands. Thus cognitive flexibility is often interpreted as one of the executive procedural functions (Miyake et al., 2000; Schaie, Dutta & Willis, 1991; Martin, Anderson & Thweatt, 1998). Cognitive flexibility carries adequacy of attention transition among related and unrelated information, it includes two levels of cognitive control; first is going beyond the conventional thoughts and beliefs and second is adapting with new uncertain conditions (Jaber, 2015).

The significance of cognitive flexibility is being an executive mental function that helps an individual to change and vary the mental handling strategies with things according to its norms, analyze its difficulties to pare factors can be handled, and exploit these factors to invent solutions. This function relates to the cognitive strategy of self-regulated learning. However, the individual with a high level of cognitive flexibility is capable to regulate and amend his experiences and knowledge to achieve potential results, as well he is known for higher awareness of the cognitive process, possible alternatives, and deal with more complicated cognitive experiences (Dennis & Vander, 2010).

Cognitive Flexibility is a prominent characteristic. It does not involve in one attitude rather than a common attitude that incorporates cognitive processes such as conscious, mental representation, and alternative induction and assessments. Moreover, cognitive flexibility is not only the capability of recognizing internal relationships between things and concepts, but cognitive flexibility also imposes a recognition of similarities and differences among things and concepts that depend on a connection terminal, while cognitive inflexibility relies on the other terminal. Cognitive flexibility is demonstrated through an individual capability to recognize alternatives related to particular conditions and responses coinciding with this condition's requirements, in addition to the presence of flexibility desire. In conclusion, it is the ability to modify cognitive strategies that an individual uses in adapting new and unfamiliar circumstances (Canas, Fajardo & Salmeron, 2005).

Dennis & Vander (2010) elaborated cognitive flexibility as a person's ability to coincide with cognitive information preparing and processing strategies in emerged and unexpected conditions in the environment. Ran, John, and Shir (2009) summarized cognitive flexibility as thought series and capability to reoriented thinking stream associating with changing of faced conditions' stimulators. On the other hand, Tan (2005) formulated cognitive flexibility as individual cognitive resilience, accordance ability, and comprehending new ideas for variable circumstances and different perceptions from several resources. Shah (2003) added it is the individual capacity to rapidly inducing ideas and adjust mental conditions toward recent and emerged stimulators.

According to Deak (2003), cognitive flexibility is the ability to build and continuously adjust mental representation, and induce responses based on stimulators and available information in the situation. Since every complication has various solutions, in which flexible individual is constructing new mental representations or amending previous representation.

Caetwright (2008) noticed that individuals with a high level of cognitive flexibility exhibit self-induction of cognitive adjusting preserved information obtained by previous experiences. This helps them to trigger minds in different insights into new condition. This mental process releases mental processing sources to coinciding with new conditions. Comparing to an individual with an adequate level of cognitive flexibility who needs to utilize mental processing resources to tackle with a simple version of the problem.

Cognitive flexibility development requires a practice associating with personal patterns among

learned individuals. The growth capabilities that individuals own are a benefited result of experiences they face concurring the positive impact of a high level of motivation and a clear vision on cognitive flexibility. Developing cognitive flexibility among educated individuals to a high level, yielding individuals interact effectively with life problem solving compared to others who do not own this capability (Konik & Crawford, 2004).

McNulty, Ryan, Evanoff, and Rainford (2012) classified cognitive flexibility into two primary elements; adaptive cognitive and spontaneous cognitive. Adaptive cognitive is the ability to adjust and change thinking strategies due to particular challenges. These challenges need to be solved through changing cognitive perception without restricting to the particular framework, and it is considered as a positive terminal of mental coherence. The flexible person (i.e mental adaptive) is contrary to the mental inflexible person. Adaptive flexibility exhibits while facing practical life challenging and finding innovative solutions, like solving social challenges that known for overlapping and difficulty obtaining a solution. The second element is spontaneous flexibility, which defined as the ability to produce a higher amount of various ideas related to a particular condition, like using objectives unconventionally. And it also deliberated as the competence of rapidly inducing a higher amount of various ideas related to a particular condition. Spontaneous flexibility measures the speed of thought induction based on an individual's emotional readiness.

Previous studies revealed the correlation between the key elements of quality of life and cognitive flexibility. Like the study of Remer & Beversdorf (2010), which found a negative relationship between cognitive flexibility and psychological pressure, and the study of Dennis and Vander Wall (2010) found that deficit of cognitive flexibility correlates with depression symptoms, and increasing cognitive flexibility correlates with adaptive capability. Gabrys et al. (2018) indicated the association between low rating cognitive flexibility and depression symptoms. Likewise, Abbate - Daga et al (2011) revealed that persons with anorexia nervosa have restrictions in cognitive flexibility and deficits in decision making. Dimitras (2020) emphasized that cognitive flexibility correlates positively with dimensional aspects of self-efficacy and mental welfare.

Bilgin (2017) found that a higher rating level of cognitive flexibility associates with openness, self-regulate, adaptive ability, and self-actualization. Zhang (2011) argued that practice on cognitive flexibility skills increases the effectiveness of adolescents assisting to cope with complicated adaptive problems. However, Lin (2013) conducted a study over a sample of 770 university students and found that cognitive flexibility has a positive influence on openness to change and academic performance. Likewise, Ahn, Kim, and Park (2008) asserted the negative relationships between cognitive flexibility and social conflicts. The study of Kato (2012), which conducted university students and shown that cognitive flexibility has a positive correlation with mental health including a level deficit of depression, anxiety, and distress. According to Bling (2011), cognitive flexibility is an indicator of academic adaption. Cikrıkci (2018) revealed that cognitive flexibility correlates positively with life satisfaction. Similar to Asıcı & İkiz (2015), who found that the happiness and cognitive flexibility has positive relationships, in line with Tamir (2015) findings shown that cognitive flexibility helps individual to achieve his objectives. In the same context, Hirt, Devers, and McCrea (2008) and Johnson (2016) emphasized that cognitive ability decreases the impact of negative experience and supports adaptive competence.

In summary, the previous studies asserted the strong relationships that combine cognitive flexibility and numerous elements related to the quality of life. The current study intends to introduce an integral vision of quality of life and its dimensions such as health, social and family life, education and learning, emotional life, mental health, and time management, and its relationships with cognitive flexibility (adaptive and spontaneous) among higher education students due to gender, accumulative average, and academic year.

The study questions are:

- 1) Are there statistically significant differences in the quality of life dimensions (quality of health, social and family life, education and learning, emotional life, mental health, and time management) among higher education students due to gender, academic year or

accumulative average?

- 2) Is there a statistically significant relationship between quality of life dimensions (quality of health, social and family life, education and learning, emotional life, mental health, and time management) and cognitive flexibility (adaptive and spontaneous) among higher education students?

The study limited to the students enrolled in the second semester of 2019/2020 in Al-Balqa'a Applied university/ princess Rahma College. Thus, the generalizability of study results is restricted to the current study population and similar populations, and psychometric properties of the study tools.

1.2 Study Hypotheses

- **H1:** There is a statistically significant difference on the average of responses quality of life dimension (quality of health, social and family life, education and learning, emotional life, mental health, and time management) between higher education students due to gender, academic year, and accumulative average.
- **H2:** There is a statistically significant relationship between quality of life dimension (quality of health, social and family life, education and learning, emotional life, mental health, and time management) and cognitive flexibility (adaptive and spontaneous cognitive) among higher education students.

2. Methods

2.1 Study Instruments

- 1) **QOL scale** of higher education students developed by Mansy & Kazem (2010). The scale consisted of 60 items, classified equivalently into six dimensions; quality of health, quality of social and family life, quality of education and learning, quality of emotional life, and time management. The QOL scale considered the definition of QOL as individual feelings of satisfaction, happiness, and capable to fulfill his demands through enriched environments and sophisticated offered services in the social, educational, and psychological fields, which concurs with the effective utilization and time management. The scale has good psychometric properties. In this study, the correlation coefficient is used to validate the scale particularly the constructive validity of the scale. Pearson correlation coefficient of each item and related category ranged from 0.56 to 0.73, while, the coefficient value of correlation among items and overall scale ranged from 0.52 to 0.71. All coefficient values are statistically significant at a significant level of $\alpha = 0.05$. Hence, these values asserted the constructive validity of the scale. In turn, items measure what intends to measure. To assess scale reliability, internal consistency is validated through measuring Cronbach's Alpha coefficient for six categories of scale. The coefficient were (0.78, 0.81, 0.83, 0.80, 0.79, 0.87) respectively, which considered acceptable according to study purposes.
- 2) **Cognitive Ability Scale** prepared by (Abdulwahab, 2011) consisted of 30 items, classified into two dimensions; adaptive cognitive and spontaneous cognitive. The original scale earned good psychometric properties. In this study, the correlation coefficient is used to validate the scale particularly the constructive validity of the scale. Pearson correlation coefficient of each item and related category ranged from 0.58 to 0.72, while, the coefficient value of correlation among items and overall scale ranged from 0.56 to 0.70. All coefficient values are statistically significant at a significant level of $\alpha = 0.05$. Hence, these values asserted the constructive validity of the scale. In turn, items measure what intends to measure. To assess scale reliability, internal consistency is validated through measuring Cronbach's Alpha coefficients for two dimensions of the scale. The coefficients were 0.81 and 0.82 for scale dimensions, which considered acceptable according to study purposes.

Study sample consisted of 325 female and male students enrolled in the second semester of 2019/2020 in Al-Balqa'a Applied university.

3. Finding and Discussion

3.1 Findings

H1: There is a statistically significant difference on the average of responses quality of life dimension (quality of health, social and family life, education and learning, emotional life, mental health, and time management) between higher education students due to gender, academic year, and accumulative average.

Table 1. MANOVA Test Results of the Mean Score of QOL Categories due to Gender, Academic Year, and Accumulative Average.

Source	QOL (Dependent Variable)	SS	df	MS	F	P
Gender Hotelling's T ² =0.38 Sig.=0.067	Health	2.437	1	2.437	7.800	0.006
	Social and family life	14.065	1	14.065	3.373	0.067
	Education and Learning	0.330	1	0.330	1.324	0.251
	Emotional life	0.536	1	0.536	2.640	0.105
	Mental Health	0.232	1	0.232	1.195	0.275
	Time Management	1.361	1	1.361	8.203	0.004
Accumulative Average Wilk's Λ=0.800 Sig.=0.000	Health	14.087	4	3.522	11.272	0.000
	Social and family life	9.834	4	2.459	.590	0.670
	Education and Learning	6.166	4	1.541	6.178	0.000
	Emotional life	2.954	4	0.739	3.636	0.007
	Mental Health	5.439	4	1.360	7.016	0.000
	Time Management	4.583	4	1.146	6.907	0.000
Academic Year Wilk's Λ=0.607 Sig.=0.000	Health	31.341	3	10.447	33.437	0.000
	Social and family life	78.086	3	26.029	6.242	0.000
	Education and Learning	26.107	3	8.702	34.878	0.000
	Emotional life	16.367	3	5.456	26.857	0.000
	Mental Health	25.148	3	8.383	43.254	0.000
	Time Management	18.178	3	6.059	36.530	0.000
Error	Health	98.730	316	0.312		
	Social and family life	1317.643	316	4.170		
	Education and Learning	78.843	316	0.250		
	Emotional life	64.192	316	0.203		
	Mental Health	61.243	316	0.194		
	Time Management	52.414	316	0.166		
Corrected Total	Health	146.949	324			
	Social and family life	1422.454	324			
	Education and Learning	111.426	324			
	Emotional life	84.548	324			
	Mental Health	93.308	324			
	Time Management	77.291	324			

Table no.(1) illustrated the statistically significant differences in the health quality among higher education students in favor of male students with a higher mean ($M = 3.45$) compared to female students ($M = 3.28$). Furthermore, there are statistically significant differences in time management in favor of male students with a higher mean ($M = 3.37$) compared to female students ($M = 3.23$). And there is no statistically significant difference in the rest dimensions of QOL between female and male students. According to results obtained (see table no.1), there are statistically significant differences

in the health quality, education and learning quality, emotional life, mental health quality and time management due to accumulative average, in which differences debated in table no.2.

In terms of the academic year, table no.1 emphasized statistically differences in the health quality, social and family quality, education and learning quality, emotional life quality, mental health quality, and time management due to the academic years, detailed explanation of differences shown in table no.3.

Table 2. Tukey Test Results To Define The Differences Sources of the mean scores health quality, education and learning, emotional life, mental health, and time management due to Accumulative Average

QOL Categories	Accumulative Average (M)	Accepted	Good	Very Good	Excellent
Health	(3.2867)poor/passed	.2956	.1894	-.0689	-.4237*
	(2.9911)Accepted		-.1062	-.3645*	-.7193*
	(3.0973)Good			-.2583*	-.6131*
	(3.3555)Very Good				-.3548*
Education and Learning	(3.7103)Excellent				
	(3.7933)poor/passed	.2633	.2603	.1018	-.1683*
	(3.530)Accepted		-.0030	-.1615	-.4316*
	(3.5330)Good			-.1585	-.4286*
Emotional Life	(3.691)Very Good				-.2701
	(3.961)Excellent				
	(3.1778)poor/passed	-.0538	-.0578	-.2143	-.3319
	(3.2316)Accepted		-.0040	-.1605	-.2781*
Mental Health	(3.2356)Good			-.1565	-.2741*
	(3.3921)Very Good				-.1176
	(3.5097)Excellent				
	(3.0722)poor/passed	-.2275	-.2538	-.3561	-.6949*
Time management	(3.2997)Accepted		-.0263	-.1286	-.4674*
	(3.3260)Good			-.1023	-.4411*
	(3.4283)Very Good				-.3388*
	(3.7671)Excellent				
Time management	(3.1778)poor/passed	.0583	.0570	-.1006	-.3332*
	(3.1195)Accepted		-.0013	-.1589	-.3915*
	(3.1208)Good			-.1576*	-.3901*
	(3.2784)Very Good				-.2326*
	(3.5110)Excellent				

*Statistically significant $\alpha < 0.05$

Table no. 2, obviously showed the statistically significant differences in health quality among students with an accepted average, very good average and excellent average in favor of students with very good average and excellent average. There are statistically significant differences in health quality among students with a good average, very good average, and excellent average in favor of students with a very good average and excellent average. And there are statistically significant differences in health quality among students with a very good average and excellent average in favor of students with an excellent average. However, differences in the education and learning quality were statistically significant between students with an accepted and excellent average in favor of excellent average students, as well, the differences were significant statistically in the education and learning among very good average students and excellent average students in favor of excellent average students.

According to emotional life quality statics, table no. 2 verified the statistically significant differences between a good average and an excellent average in favor of an excellent average. While,

the differences in the mental health quality were statistically significant among students of (poor/passed, accepted, good, and very good) and the students with an excellent average in favor of an excellent average. In terms of time management quality, the differences were statistically significant among students with a good average and very good average in favor of very good average, similar to the differences among students with (accepted, good, and very good) average and excellent average in favor of excellent average students.

Table 3. Tukey Test Results To Define The Differences Sources of the mean scores health quality, social and family life, education and learning, emotional life, mental health, and time management due to Academic Year

QOL QOL Categories	Academic Year (M)	Second Year	Third Year	Fourth Year
Health Quality	(2.8710).First Y	-.2235*	-.5974*	-.8188*
	(3.0945).Second Y		-.3739*	-.5953*
	(3.4684).Third Y			-.2214
	(3.6898).Fourth Y			
Social and Family life	(2.8710).First Y	-.2220	-.6011	-.14077*
	(3.0930).Second Y		-.3791	-.11857*
	(3.4721).Third Y			-.8066
	(4.2787).Fourth Y			
Education and learning	(3.3104).First Y	-.1970*	-.5187*	-.7551*
	(3.5074).Second Y		-.3218*	-.5581*
	(3.8291).Third Y			-.2364*
	(4.0655).Fourth Y			
Emotional Life	(3.0540).First Y	-.1520	-.4127*	-.6077*
	(3.2060).Second Y		-.2607*	-.4557*
	(3.4667).Third Y			-.1950
	(3.6617).Fourth Y			
Mental Health	(3.0410).First Y	-.2628*	-.5763*	-.7433*
	(3.3038).Second Y		-.3135*	-.4805*
	(3.6173).Third Y			-.1670
	(3.7843).Fourth Y			
Time Management	(2.9070).First Y	-.2447*	-.4811*	-.6407*
	(3.1517).Second Y		-.2365*	-.3960*
	(3.3881).Third Y			-.1595
	(3.5477).Fourth Y			

*Statistically significant $\alpha < 0.05$

Table no. 3 shows the differences in the health quality were statistically significant between first year students and second, third and fourth students in favor of second, third and fourth year students. Similar to the differences in the education and learning quality were statistically significant between first year students and second, third and fourth students in favor of second, third and fourth year students, in the same time, the differences were statistically significant in education and learning between second year students and third and fourth year students in favor of third and fourth years students, while differences between third and fourth year students were statistically significant in education and learning in favor of fourth year students.

According to table no.3, the differences were statistically significant in the social and family life between (first and second) years students and fourth year students in favor of fourth year students, while differences in the emotional life quality were significant between first and second year students and third and fourth year students, in favor of third and fourth year students. Obviously, there were statistically significant differences in both mental health and time management among first year students and second, third and fourth year students in favor of second, third and fourth year

students, and there were statistically significant differences in both mental health and time management among second year students and third and fourth students, in favor of third and fourth students.

H2: There is a statistically significant relationship between quality of life dimension (quality of health, social and family life, education and learning, emotional life, mental health, and time management) and cognitive flexibility (adaptive and spontaneous cognitive) among higher education students.

Table 4. Pearson Correlation among QOL scale(health quality, social and family life, education and learning, emotional life, mental health, and time management) and Cognitive Flexibility (Adaptive and spontaneous).

QOL \ Cognitive Flexibility	Health	Social and family life	Education and Learning	Emotional Life	Mental Health	Time Management	Overall score
Adaptive Cognitive	.149**	.140**	.268**	.142**	.134**	.144**	.174**
Spontaneous Cognitive	.143**	.069	.302**	.076	.183**	.127**	.163**
Overall Score	.159**	.116	.312**	.118	.174**	.148**	.184**

*Statistically Significant at level $\alpha < 0.05$

** Statistically Significant at level $\alpha < 0.01$

Table no.(4) exhibited the positive statistically significant correlation between the overall score of cognitive flexibility and the overall score of quality of life, there is a positive statistically significant correlation between adaptive cognitive flexibility and all QOL dimensions (health, social and family life, education and learning, emotional life, mental health, and time management), there is a positive statistically significant correlation between spontaneous cognitive flexibility and four dimensions of QOL (health, education and learning, mental health, and time management), and there is no statistically significant correlation between spontaneous cognitive flexibility and two dimensions of QOL (social and family life and emotional life).

3.2 Discussions

The study aimed to inspect the higher education students' quality of life (health, social and family life, education and learning, emotional life, mental health, and time management), and investigate the relationship between quality of life and cognitive flexibility (adaptive and spontaneous) among higher education students.

The first hypothesis inspected differences in the average score of QOL(health, social and family life, education and learning, emotional life, mental health, and time management) according to gender, academic year, and the accumulative average of higher education students. Statistical results indicated statistically significant differences in health and time management due to gender in favor of male students. While there was no difference in the social and family life, education and learning, emotional life and mental health due to gender. In terms of male students' excellence in health quality, it can be referred to psychological norm of female students in this developmental phase reduces health quality among female students compared to male students. As aforementioned, male students have higher quality in time management due to the unique Jordanian culture of family upbringing that males are more likely to incur self-dependence responsibility rather than females. In turn, it increases the interest of males on the time management and utilization free times, which increase males' feeling sense of time management quality. Contrary, this dominant restricted culture deficits females' likelihood of self-dependence, world exploring opportunities, and effective free time utilization, which decreases females' feeling sense of time management quality.

Moreover, results revealed a statistically significant difference in QOL dimensions (health, education and learning, emotional life, mental health, and time management) due to the

accumulative average of students. Results asserted that the quality of life feeling increases as increasing in the accumulative average of a student. The results agreed to the traits of students who achieve higher accumulative average such as perseverance, achievement feelings, adaptions, self-efficacy. All these traits and other traits are correlated with educational excellence that increases students' feelings of life quality, contradictory to lower accumulative average that inclines feelings of failure, deficit, and inefficiency of self, which declined students' feelings of life quality.

Due to academic year, results emphasized the statistically significant differences in the quality of life dimensions (health, social and family life, education and learning, emotional life, mental health, and time management). The results asserted that quality feelings of these aspects increase as the academic year progresses. This interpreted due to increasing experience amounts that students go through either during educational courses or extracurricular activities or interaction within higher education daily life. These experiences shape students' personalities, hence, they have a higher feeling of life quality.

The second hypothesis of the study distinguished the relationship between quality of life and cognitive flexibility among higher education students. Results explored the positive relationships between the overall scale of quality of life and the overall scale of cognitive flexibility among higher education students, positive relationships among adaptive cognitive flexibility and health, social and family life, education and learning, emotional life, mental health, and time management, and positive relationships between spontaneous cognitive flexibility and health, education and learning, mental health, and time management. These results reflect the rational functional relationship between cognitive flexibility and quality of life dimensions. The cognitive flexibility links with the various psychological process and executive functions such as regulate feelings, self-regulation, solve problems, and take decisions (Dajani and Uddin, 2015). Since emotionally disturbed persons and persons with depressions lack cognitive flexibility (Murphy et al., 2012; Snyder, 2013; Trivedi and Greer, 2014) since it considers as one of the procedural cognitive functions assess persons to cope fluctuated environments demands (Miyake et al., 2000; Schaie, Dutta & Willis, 1991; Martin, Anderson & Thweatt, 1998). This asserted the functional correlation among cognitive flexibility and the majority of the quality of life dimensions. This result coincides with the result of Remer & Beversdorf (2010) study that emphasized the negative correlation between cognitive flexibility and psychological pressure. Similar to (Dennis and Vander Wall, 2010; Gabrys et al., 2018) study which shown the indicator deficit of cognitive flexibility correlates with depression symptoms and increasing indicators of cognitive flexibility associates with adaptive competences. Furthermore, these results agreed with Abbate- Daga et al (2011) outcomes found that persons with anorexia nervosa have cognitive flexibility limitation and deficit in decision making, as well, Dimitras (2020) found that cognitive flexibility positively correlates with self-efficacy dimensions and mental health. Moreover, current results in consensus with results of many studies such as Ahn, Kim & Park (2008) indicates to the negative correlation between cognitive flexibility and social conflicts, Kato (2012) mentioned that cognitive flexibility correlates positively with mental health among higher education students comprises deficit of depression, anxiety and distress, Bing (2011) considered cognitive flexibility as indicators of academic adaptive, Çikrikci (2018) revealed the positive association between cognitive flexibility and life satisfaction, Asıcı & İlkiz (2015) introduced evidence about the positive correlation between cognitive flexibility and happiness, Tamir (2009) noticed that cognitive flexibility helps ultimately person to success and achieve his objectives in life, and Biligin (2017) study that deliberated the positive cognitive flexibility and adaptive and self-achievement competencies.

The outcomes of the study corresponding to Hirt, Devers, McCrea (2008), Johnson (2016) findings that cognitive flexibility decreases the consequences of bad experiences and supports adaptive capability, the study of Zhang (2011), which found cognitive flexibility skills training aids coping complex adaptive problems, and study of Lin(2013) which pointed out that cognitive flexibility has a positive influence on openness to change among higher education students.

4. Conclusion

This study asserted the differences in the quality of life (health, time management) among higher education students due to gender in favor of male students, and there are statistically significant differences in the quality of life (health, education and learning, emotional life, mental health, and time management) due to the academic year. Furthermore, the results disclosed the positive statistically significant relationships among the overall score of cognitive flexibility and the overall score of quality of life, as well, there is a positive relationship between the adaptive cognitive flexibility and the quality of life (health, social and family life, education and learning, emotional life, mental health, and time management), and there is a positive relationship between spontaneous cognitive flexibility and dimension of quality of life (health, education and learning, mental health, and time management).

The study suggestions formulated based on study results, and including the necessity to afford extracurricular and curricular programs by higher education institutes, which aim to increase the feeling sense of life quality based on the development of cognitive flexibility skills utilizing the positive correlation between the quality of life and cognitive flexibility. The programs must target female students and focus particularly on two main aspects health and time management, and target first and second years students, and students with good and accepted accumulative average focuses on all quality of life aspects. The study recommends conducting further studies in the context of relationships among quality of life and other variables such as mindfulness, cognitive strategies, etc.

References

- Abbate-Daga, G., Buzzichelli, S., Amianto, F., Rocca, G., Marzola, E., McClintock, S. M., & Fassino, S. (2011). Cognitive flexibility in verbal and nonverbal domains and decision making in anorexia nervosa patients: A pilot study. *BMC Psychiatry*, 11(162). <https://doi.org/10.1186/1471-244X-11-162>.
- Abdulwahab, S. S. (2011). Mental Flexibility and Its relationship to future time perspective and achievement goals among faculty membership in University. *Journal of educational qualitative research*(20), 20-78.
- Ahn, A. J., Kim, B. S. K., & Park, Y. S. (2008). Asian cultural values gap, cognitive flexibility, coping strategies, and parent-child conflicts among Korean Americans. *Cultural Diversity and Ethnic Minority Psychology*, 14(4), 353-363. doi: 10.1037/1099-9809.14.4.353
- Asıcı, E. & İkiz, F. (2015). A pathway to happiness: Cognitive flexibility. *Mehmet Akif Ersoy University Educational Faculty Journal*, 1(35), 191-211.
- Al-Shrafi, M. (2012). Coping styles of traumatic experience among UNRWA teachers in Gaza and its relationship to quality of life. *Master thesis*. GAZA: Al-Azhur University.
- Bilgin, M. (2017). Relations to five factor personality model with cognitive flexibility in adolescents. *Electronic Journal of Social Sciences*, 16(62), 945954.
- Bing, Z. (2011). *A relationship study on cognitive flexibility and school adaptation for the freshmen* (Master's Thesis). Hebei University, China.
- Cikrikci, O. (2018). The predictive roles of cognitive flexibility and error oriented motivation skills on life satisfaction. *International Journal of Eurasia Social Sciences*, 9(31), 717-727.
- Canas, J., Fajardo, I., Antoli, A. & Salmeron, L. (2005). Cognitive inflexibility and the development and use of strategies for solving Complex dynamic problems: effects of different types of training. *Theoretical Issue in Ergonomics Science*, 6(1), 95-108.
- Cartwright, K. B. (2008). *Cognitive flexibility and reading comprehension: Relevance to the future*. Paper presented at the C.C. Block & S. R. Parris (Eds), *Comprehension instruction Research-based best practices*, (2nd), pp. 50-64. Guilford Publishing, New York.
- Corr, A. (2004). *Positive Psychology: the science of happiness and human strengths*, New York: Brunner-rout ledge.
- Cunningham, G. (2004). *Educational and psychological measurement*, New York, Macmillan.
- Deak, O. (2003). The development of cognitive flexibility and language abilities. *Advances in Child Development and Behavior*, 31(1), 271-327.
- Dennis, J.P., & Vander Wal, J.S. (2010). The cognitive flexibility inventory: Instrument development and estimates of reliability and validity. *Cognitive Therapy and Research*, 34(3), 241-253.
- Dajani D. R., Uddin L. Q. (2015). Demystifying cognitive flexibility: implications for clinical and developmental neuroscience. *Trends Neurosci.* (38), 571-578. 10.1016/j.tins.2015.07.003

- Dennis, J. P., & Vander Wal, J. S. (2010). The cognitive flexibility inventory: Instrument development and estimates of reliability and validity. *Cognitive Therapy and Research*, 34, 241-253.
- Demirtaş, A. S. (2020). Cognitive Flexibility and Mental Well-Being in Turkish Adolescents: The Mediating Role of Academic, Social and Emotional Self-Efficacy. *Anales De Psicología / Annals of Psychology*, 36(1), 111-121. <https://doi.org/10.6018/analesps.336681>
- Elian, W. (2014). Dogmatism and Ego Strength and their relationship with life quality among the students of universities in the governorates of Gaza. *Master Thesis*. Gaza Governorate, Palestine: Al-Azhar University.
- Felce, D. & Perry, J. (1995). Quality of life: Its Definition and Measurement. *Research in Developmental Disabilities*, 16(1), 51-74.
- Gabrys, R. L., Tabri, N., Anisman, H., & Matheson, K. (2018). Cognitive control and flexibility in the context of stress and depressive symptoms: The cognitive control and flexibility questionnaire. *Frontiers in Psychology*, 9(2219). <https://doi.org/10.3389/fpsyg.2018.02219>
- Hirt, E. R., Devers, E. E., & McCrea, S. M. (2008). I want to be creative: Exploring the role of hedonic contingency theory in the positive mood-cognitive flexibility link. *Journal of Personality and Social Psychology*, 94, 214-230.
- Jaber, M. (2015). Predictors of cognitive flexibility among university students. *Social and Educational Studies*, 21(3), 1059-1110.
- Johnson, B. T. (2016). *The relationship between cognitive flexibility, coping, and symptomatology in psychotherapy* (Master's Thesis). Faculty of the Graduate School, Marquette University, Wisconsin. Retrieved from <https://search.proquest.com/pqdtglobal/docview/1784011416/fulltextPDF/C30DC2A5C82D4DD8PQ1?accountid=11054>
- Konik, J. & Crawford, M. (2004). Exploring normative creativity: Testing the relationship between cognitive flexibility and sexual identity. *Sex Roles*, 51(3) 249-253.
- Lin, Y. (2013). *The effects of cognitive flexibility and openness to change on college students' academic performance* (Master's thesis). Hebei University, China
- Mansy, M., & Kazem, A. (2010). Development and Validation of a Quality of Life Scale for University Students at Sultanate of Oman. *Amarabac international scientific Journal*, 1(1), 41-60.
- Martin, M., Anderson, C. & Thweatt, K. (1998). Aggressive Communication Traits and Their Relationship With Cognitive Flexibility Scale. *Journal of Social Behavior & Personality*, 13(3), 531- 540.
- McNulty, J., Ryan, J., Evanoff, M., & Rainford, L. (2012). Flexible image evaluation: I Pad versus secondary-class monitors for review of MR spinal emergency cases, a comparative study. *Academic Radiology*, 19(8), 1023-1028.
- Moorjani J. D, & Geryani, M. (2004). A Study of life Satisfaction and general well-being of college student. *Psycho Lingua*, (34), 66-70.
- Miyake, A.; Friedman, N P; Emerson, M J.; Witzki, A H; Howerter, A; Wagner, T (2000). "The unity and diversity of executive functions and their contributions to complex "frontal lobe" tasks: A latent variable analysis". *Cognitive Psychology*. 41(1), 49-100. PMID 10945922. doi:10.1006/cogp.1999.0734.
- Murphy F. C., Michael A., Sahakian B. J. (2012). Emotion modulates cognitive flexibility in patients with major depression. *Psychol. Med.* 42. 1373-1382. 10.1017/S0033291711002418
- Ran, R., John, A., & Shira, Z. (2009). Automatic and Flexible. *Public Acces and PMC Journals*, 27(1), 20-36.
- Remer, K. & Beversdorf, D. (2010). Effects of Naturalistic Stressors on Cognitive Flexibility and Working Memory Task Performance. *Neuroses (Psychology Press)*, 16 (4), 293-300.
- Schalok, R. (2000). Three Decades of Quality of life. *Focus in Autism & other developmental disabilities*. 15 (2), 127-166.
- Seed, P. & Lloyd, G. (1997). *Quality of Life*, London Jessica: Kingsley Publishers.
- Shah J., Y. (2003). How representations of significant others implicitly, Automatic for the people: affect goal pursuit. *The Journal of Personality and Social Psychology*, 84 (38), 388-402.
- Suliman, S. K. (2010). Measure Quality of life among sample of Tabuk university Students in Saudi Arabia and the impact of some variables on it. *Arabic Gulf Message*, 31(117), 117-155.
- Snyder H. R. (2013). Major depressive disorder is associated with broad impairments on neuropsychological measures of executive function: a meta-analysis and review. *Psychol. Bull.* 139, 81-132. 10.1037/a0028727
- Tan, M. (2005). *Examining the impact of an Out Ward Bound Singapore program on the life effectiveness of adolescents*. Unpublished master's thesis, University of New Hampshire, Durham, NH.
- The World Health Organization (1995). Quality of life assesment. *Position paper form the world health organization social science And medicine*, 41(10), 103-140.
- Tamir, M. (2009) What do people want to feel and why? Pleasure and utility in emotion regulation. *Current Directions in Psychological Science*, 18, 101-105.
- Zhang, J. H. (2011). *Relationship between cognitive flexibility and coping strategies of high school students* (Master's Thesis). Hebei University, China.