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Research Article

Quality of Life and its Relation to Creative Thinking among a Sample of Female Adolescents in Jeddah

Huda Assem Mohammed Khalifa

King Abdulaziz University, Department of Psychology, Faculty of Arts and Humanities, Jeddah, Saudi Arabia

Abstract: **The study of subjective well-being in adolescence has had recent and dynamic growth, however, there are still few qualitative studies that contribute to getting to know about and discussing the sociocultural diversity of well-being, in particular ones that consider the socioeconomic status of the studied groups.**

The purpose of this study is to prove that Quality of Life plays a large role in an individual's Creative Thinking abilities.

Two hundred sixty-four female middle-school students (first, second and third grades) in Saudi Arabia, aged 12-15 were chosen randomly for participation in this study. The students were then subjected to Quality of Life Scale (QOL) and The Torrance Tests of Verbal Creative Thinking.

The results showed quite a few differences regarding the group's Quality of Life and Creative Thinking Scores. There was a positive statistically significant correlation of 0.01 between the "family and social life", "general health", the total degree of Quality of Life perceived and Creative Thinking. On the other hand, there was no statistically significant correlation between "Time management" and the total and subscales of the Creative Thinking Scale. The results also showed that there is a statistically positive effect at 0.05 level of Quality of Life on Creative Thinking, where the value of the beta coefficient is 0.36 proving that Creative Thinking can be predicted by Quality of Life.

The findings suggest that the Quality of Life represented in home and school environments, and health in general does influence creative thinking in adolescents. These points raise important issues in relation to Creative Thinking by implying that fostering creative thinking of adolescents requires a suitable environment.

Keywords: Quality of life; Creative thinking; Teenagers; Adolescents; Creativity

I. Introduction

Creative thinking is an elusive concept, yet it constitutes an important facet of daily life. Creativity is a concept surrounded by beliefs and misconceptions. People believe it is limited to only a few, declines seriously with age and is associated primarily with uniqueness or innovation or "artists" (Adams-Price 1998; McCormick & Plugge 1997; Runco 1996). However, research shows that creative thinking is a universal ability that can help adults create satisfying lives and that is increasingly in demand in the workplace (Runco et al., 2010;Jenaabadi & Haghgoo,2015).

Adolescence is one of the most important stages affecting the development of an individual's perceptions of the quality of his/her life. This is also the beginning of a new birth for the individual while moving from childhood to adulthood. Quality in the life of the adolescent, when his or her character is shaped, affects the stability of his/her behavior at the earliest and perhaps till its very end (Al-Sabah & Ganzrah, 2015).

Jewett & Katzev (1993) stressed the importance of the effective roles of both the family and school in developing the creative abilities of the gifted individual. They also stressed the need for cooperation between family and school for providing material support and the use of technological techniques and advanced methods to achieve this. Bernheimer (2002), and Al-Mehy (2014) show that with an increase of parental experience and high levels of education, culture and economics, children's creative process and innovative features are increasing.

A lot of burdens whether spiritual, health, moral, educational or economic used to be put on families as they were the first social institution and the foundation for the child's social upbringing. Families then had the sole responsibility for developing a child's intelligence and abilities, through the provision of a good family environment (Shafi'i, 2014).

Over the last several years, there has been a significant shift of focus. Reserachers has become increasingly interested in adopting a less stigmatizing approach that acknowledges that adolescents possess unique strengths, talents, competencies, and skills (Donovan and Nickerson 2007; Cox 2006). In addition, a growing number of studies (McDougall et al. 2015; Van Damme et al., 2014; Olympia et al., 2013; Weitkamp et al., 2013)suggest that solely relying on traditional outcomes (e.g., psychopathology, behavioral changes) is insufficient for grasping the entire

life of adolescents.Additional influences (e.g., personal, community and family factors) on Quality of Life (QOL) and the adolescents' own perception of their overall QOL need to be taken into account ((White-Koning et al., 2011). Today, QOL has become a recognized field of study and a valued outcome in research and clinical practice in child and adolescent populations (McDougall et al., 2015).

A growing interest in the study of well-being has been developing in various disciplines and within the context of the study of QOL, aimed at knowing and better understanding positive development (not only disease and social problems), its causes and other dimensions related to Creative Thinking (May, 2015).

Quality of Life in the present era has become a national trend in society and a goal that all its economic, political, social and educational systems seek to achieve (Hussain, 2009). The United Nations Educational, Scientific and Cultural Organization(UNESCO)has adopted QOL from a perspective that focuses on the family, society, people's relations and the cultural requirements of the new social life.

The key purpose of this research is to understand better the complex relationships between individuals' creative thinking abilities especially during their adolescent phase and their built and natural surroundings aka QOL (Gifford, 2009).

Over the last decades, our understanding of youth health and well-being has undergone significant shifts in conceptualization that has led to the new approach of QOL research and positive psychology (Corral-Verdugo 2012). Among the most important shifts has been the move towards strengths-based understanding of the relationship between young people's health and well-being on their creativity or creative thinking (Masten, 2014). The influence of everyday environments on individuals' thinking, feeling, and actions has been extensively examined in some Research studies including Gifford (2014) and Oishi (2014).

A. What is Creative Thinking and How it Could be Developed?

People engage in unique thinking because of an intrinsic desire to find new and better things. This is called creative thinking. The power of a nation depends greatly on the quality of new knowledge and unique information produced. Our societies require creative thinking more and more than in the past and because of social changes, the Kingdom of Saudi Arabia is paying more attention to the development of creativity (Lee, 2005).

In order to raise Creative Thinking and develop educational programs for children, we need to know what creativity is, how to measure it, how it changes according to age and how the quality of life impacts upon it.

Since Guilford addressed the definition of creativity in the 1950s, various other definitions have been presented (Guilford, 1950). Psychologists have considered creativity as a trait of character, as creative process, as creative environment, and as inventive product. Researchers go on to say that when the traits of character, process, environment, and product interact with each other, creativity is mobilized (Isaksen et al., 1993).

Creativity is a complex of traits, skills, and capacities, including curiosity, unconventional thinking, openness to experience, the ability to work autonomously and tolerance of ambiguity (Adams-Price 1998; Albert 1996). Highly creative adults exhibit deep knowledge of and a strong bond with their subject matter, as well as intrinsic motivation (Amabile 1996; Keegan 1996).

For some people, creativity is an adaptive, innovative response to environmental sources of distress such as early the death of a parent or other family problems, misfortunes, or conflicts (Adams-Price 1998; Albert 1996), as opposed to other people whose coping mechanisms might be substance abuse, depression, or withdrawal (McCormick & Plugge 1997).

A growing body of research is examining how environmental factors affect the creativity of an individual in different ways. For many, creative expression is limited by their education and training, cultural standards, lack of social support, and for women, traditional gender expectations. Women inventors (McCracken 1998) cite gender discrimination as a hindrance to creative activity. Women artists describe difficult family-related choices they've had to make that diverted them from their art, although such obstacles as lack of support, money, or child care did contribute to the creative process and their identity as artists (Kirschenbaum & Reis 1997).

We all have the potential to be creative. One might think that being creative means doing creative things, but a creative thinker doesn't always end up in creative roles. You could think of creative thinking as taking an alternative way to get to an answer. Creative Thinking implies the use of lateral or divergent thinking. In other words, ignoring preconceived, "normal" ideas, and thinking of original, alternative ideas (Lucas et al., 2013).

B. Creative Thinking during Adolescence

Environmental influences may explain in part why childhood creativity seems to be a poor predictor of adult creativity (Albert, 1996). Although most young children are very creative, it is estimated that creativity diminishes by 40% between the ages of 5 and 7 (Grupas 1990; McCormick and Plugge 1997). At these ages, Quality of Life starts making a difference and impacts on their creative thinking either positively or negatively. For instance, a recent study had some startling findings regarding Creative Thinking scores in adolescents. It found that Creative Thinking changes with age: young children's creative thinking steadily increases until third grade, then it levels

off and begins to decrease until about high school, when increases are again observed (Kim, 2011). This aligns with a conventional stage model of creativity that suggests creative thinking levels correlate with a child's ability to understand societal conventions (Runco, 2014).

The reason creativity diminishes as children grow may vary with each stage. For young adolescents, the intense pressure to conform, fit in, and not stand out is a key factor for the (continued) loss of creativity. While teens are known for being impulsive risk-takers, within academic circles they tend to be the opposite. They conform to expectations, often work to prepare for the test, and avoid actions that may draw attention to themselves or will cause them to make public "mistakes" (Katz & Stupel, 2015).

However, there are ways to work with children's developmental drives and foster creativity at the same time. For example, children this age value connections with friends. Use this knowledge to spur creativity! For girls this might mean encouraging them to make projects for friends, such as duct tape pencil toppers or friendship bracelets for a BFF. For boys it might mean using trading cards as taking off points to explore imaginary worlds or creating new rules for favorite sports or games. Middle schoolers are often beginning to question their parent's values and the expectations of their teachers. Helping children see that divergent thinking requires questioning of the typical ways of doing things, might be just the spark they need to invest in more creative endeavors (Grant, 2012).

Even though Creative Thinking is valuable and necessary for both individuals and society, there is growing concern that life's settings do not provide adolescents with appropriate opportunities to develop Creative Thinking (Beghetto et al., 2012). This is often because the changing phase of adolescence is filled with pressure and confusion.

C. Quality of Life

An individual's sense of Quality of Life is a relative matter because it is entirely dependent on various factors represented in one's self-esteem, satisfaction with life, work, social status, and level of happiness as well as other subjective factors such as income, job, educational level, environmental cleanliness, health status and housing status (Suleiman, 2008).

Quality of Life is one of the basic requirements in the present time for the mental health of a child, especially in the light of family problems that may hinder the achievement of the aspirations of its members due to changes in its social, family and economic attributes (Kish and Moody, 1999).

The quality of the residential environment represents the physical container of the adolescent's life, which the adolescent affects and is affected by. The dwelling itself is the closest residential environment that affects the life of an individual. Therefore, taking into consideration the physiological, psychological, health and design aspects of the dwelling is a necessity for creating a housing environment that will meet human needs (Muhammed, 2004). Henry & Sandra (1995) confirmed that the creation of an appropriate atmosphere in the family's residential environment is conducive to the development of the individual's creative and talented experiences.

Quality of Life is a multidimensional construct that includes evaluation of at least four main aspects of emotional well-being, physical health, social function, and spirituality (Abbasi et al., 2014). Dempsey et al., 2009 considered Quality of Life as having social, emotional, psychological and physical functions.

D. Significance of the Study

Creative thinking, which is defined as thinking that is novel and produces ideas of value (Sternberg & Lubart, 1996), is a crucial skill in society today. It plays a key role in everyday cleverness, arts and science advances, business innovation, social interactions and public policy (Moran, 2010). Creative thinkers are active learners who can find and solve problems, recognize patterns, combine information in new ways, challenge assumptions, make decisions, and seek new ideas (Healy, 2004). Creative thinking is needed to develop, refine, communicate, and execute ideas; it is needed for being open to new perspectives, demonstrating originality, understanding real-world limits, and viewing failure as an opportunity (Greenhill, 2015).

According to the Global Innovation Index Saudi Arabia was ranked 41 ahead of Italy, Poland, Turkey and China (Vong, 2008). However, its Innovation Output Index was low at the 98th place. There has not been enough research undertaken for studying adolescent life in Saudi Arabia, and specifically none on creative thinking or on student perceptions of creative thinking and how creative thinking is directly affected by Quality of Life in in Saudi Arabia. That is the aim of this study (Al-Enezi, 2003).

Realizing the importance of Quality of Life for creativity and creative thinking and in an effort to boost Quality of Life, Saudi Arabia is launching Quality of Life Program 2020, which is part of Saudi Arabia's Vision Realization Programs 2030 with more than a SR34 billion budget.

The Kingdom of Saudi Arabia is aiming to improve the lifestyles of individuals and families in order to build a society in which individuals enjoy a balanced lifestyle, by setting up the environment necessary to support and provide new options that enhance the participation of citizens and residents in cultural, entertainment and sporting activities (Al-Silami, 2010).

This study aims to emphasize the inter-related (looping) relationship between creative thinking and Quality of Life. Each of these leads to the other one; in other words, a positively boosted and supportive Quality of Life shapes the mind of a creative thinker, and at the same time if an

individual is gifted with a creative mind and has the ability to think creatively, this will help him or her lead a better life with a high Quality of Life. This research tackles creative thinking and how directly it is related to Quality of Life to determine whether any relation in these linkages can be identified.

II. Literature Review

While reviewing the literature, it was discovered that over the years, various psychologists have issued calls for greater attention to a science of positive psychology, which focuses on studying conditions that promote optimal human and societal development. Recent calls (e.g., McCullough & Snyder, 2000; Seligman & Csikszentrnihalyi, 2000) have furthered interest in studies of the nature and determinants of the good life. Such a science, along with the creation of prevention and intervention programs informed by the expanded scientific framework, is expected to improve the Quality of Life for all individuals, not just individuals who are at risk or who already demonstrate psychopathological conditions.

According to some authors, psychologists have disproportionately focused on the study of psychological ill-being (McCullough and Snyder, 2000; Seligman & Csikzentmihalyi, 2000). These authors suggest that psychologists should pay greater attention to the complementary study of psychological well-being, including the development and enhancement of human strengths and environmental resources.

Research regarding child and adolescent judgments of their QOL has received increasing attention in a variety of areas recently (e.g., Crocker, 2000; Huebner, 1997). As early as 1986, Landesman (1986) noted that QOL and Personal Life Satisfaction were the new buzz-words in the field of psychology. Current researchers in mental health (e.g., Valois et al., 2001; Day & Jankey, 1996) have extended QOL concepts to understanding efforts to promote creativity for all individuals. Although the early work was primarily aimed at adults, work has begun to extend to children and adolescents as well.

Although research with adolescents is just beginning, the preliminary findings have been encouraging. The purpose of this research is to tackle how QOL affects the level of creative thinking in adolescents. This research provides valuable information that informs the conceptualization, measurement, and importance of QOL for creative thinking.

In a recent review of the study of creativity, Hennessey and Amabile (2010) found that the study of creativity is surprisingly fragmented, whereas research into the psychology of creativity has been rapidly expanding. In recent years, creative thinking has emerged as an essential component in individual's success (Chan, 2013).

The definition of Quality of Life is particularly important in the field of adolescent studies. We know that for many authors in health sciences the constructs of QOL and well-being are more or less synonymous. However, that is not the case for most authors in the social sciences. That difference makes the literature review confusing. There is a long history of social debate and change in the meaning of adolescent well-being (Sandin, 2014); however, the history of adolescent QOL studies is very short.

Until recently, in many Western societies, the mainstream representation of childhood and adolescence was that they were "the private affair of the family". During the second half of the last century, a change in these majority social representations started. This was influenced by multiple factors, (Casas et al., 2013; Casas, 2011), such as the increased training and sensibility of many professionals and NGOs and many researchers. However, the UN Convention on the Rights of the Child has been the most influential factor to consolidate this tendency. Children have to "count" and have to be taken into account, as human beings with universal human rights.

Past research suggested that family resources and family-based social capital influenced the developmental outcome of youth, especially in educational and occupational achievement (Jeong & Chun 2010; Yi et al. 2009; Crosnoe & Elder 2004; Epstein 1992; Teachman 1987). Family relationships are the most salient factor accounting for the general psychological well-being of youth. Jou and Hsieh (2004) and Pan et al., (2004) found that family relations, more so than family characteristics, structure, and significant family life events, appear to be the most significant factor explaining adolescent creativity. Similar findings are reported in the West. For example, Drew and Silverstein (2004) investigated the psychological well-being of family members and found that, from various family relational variables, both role hierarchy and finding meaning in role enactment were linked to positive well-being and creative thinking.

There is a debate regarding the ways in which creativity and critical thinking can promote cultural development (Zeng, Proctor & Salvendy, 2011; Westwood & Low, 2003). In fact, the challenges faced by different countries go beyond the purely physical, indicating that there is a need for innovation to improve the QOL in society (Stein & Harper, 2012). Because creating new ideas, as well as analyzing and implementing them, is the main process involved in innovation (Cropley, Kaufman, & Cropley, 2011; Reiter-Palmon, 2011), the stimulation of both creativity and critical thinking in educational contexts remains important. Indeed, results from the studies conducted by the Organization of Educational and Economic Development (2009) and the United Nations Educational, Scientific and Cultural Organization (2016), in different countries, have emphasized that creativity, critical thinking, problem solving, and decision making can be assumed to be the

major 21st century competencies that will be developed by the educational system.

The integration of Creative Thinking has been emphasized in literature in recent decade (Padget, 2013; Glassner & Schwartz, 2007; Baker, Ruddy, & Pomeroy, 2001). However, studies regarding this construct as independent remain predominant (Halpern, 2014; Runco & Garrett, 2012; Kaufman, Plucker, & Baer, 2008).

The emerging attention given to studying the effect of QOL on children and adolescents arises from its capability to identify its effect on creative thinking which will define everything in their futures. Therefore, due to the significance enumerated for QOL, several studies have investigated its influential correlators in a global level.

In response to the need for creative thinking and creative minds for the development of the nation, research is needed to determine strategies that will best support creative thinking at all ages, especially the critical stage of adolescence. This research is essential at adolescence level, as the insights gained can help in all aspects of life.

III. Method

A. Subjects and Procedures (Sample)

The sample of the study consisted of (264) female middle-school students (First – Second – Third) Grades. Taking into account external variables, such as diversity in social, economic, and cultural backgrounds, the sample governmental schools were randomly selected from different parts of Jeddah, Saudi Arabia and the students were randomly chosen from them. The student ages ranged between 12 and 15 with an average 13.55 and a standard deviation of 1.7.

Table I. Distribution of the Study Sample Based on Demographical Data

Variable		Frequency	Percent
Grade	First	104	39.4%
	Second	88	33.3%
	Third	72	27.3%
	Total	**264**	**100%**
Mother's Education	High-school Diploma or Below	82	31.1%
	University Education and Higher	182	68.9%
	Total	**264**	**100%**
Father's Education	High-school Diploma or Below	70	26.5%
	University Education and Higher	194	73.5%
	Total	**264**	**100%**

B. Instruments

I: The Quality of Life Scale (QOLS): The current Quality of Life Scale was designed and applied by Dr. Mahmoud Abdelhalim Mansi and Dr. Ali Mahdi Kazim (2006), and mainly consisted of (60) items, assessing (6) main domains of QOL.

- General Health (Items 1-10)
- Family and Social life (Items 11-20)
- Education (Items 21-30)
- Emotional Well-being (Affectional Side) (Items 31-40)
- Mental Health (Items 41-50)
- Time Management (Items 51-60).

The positive items with individual numbers were given the grades of (1, 2, 3, 4 and 5), while the negative items with the even numbers (Mansi & Kazim, 2006).

The scale's validity has been validated in various ways including content and criterion validity. However, reliability was evaluated by calculating Cronbach's alpha (α) coefficients. Cronbach's α values for the total score was 0.91 and for the subscale, between 0.72 – 0.85. For total QOL and subscale scores, alphas were good (all > 0.6).

II: The Torrance Tests of Verbal Creative Thinking (TTCT): The Torrance Tests of Verbal Creative Thinking have been implied (Form A), and were translated into Arabic by Abdullah Sulaiman and Fuad Abu Hattab and have been widely used in numerous research projects in the Arab world. The test was adapted to the Saudi environment by Abdullah Nafea Al-Sharea in 2008.

The Verbal TTCT uses seven subtests (activities): Asking, Guessing Causes, Guessing Consequences, Product Improvement, Unusual Uses, Unusual Questions, and Just Suppose. The stimulus for each activity starts with a picture, and the test-taker responds to the picture in writing. The scoring components include the Fluency, Originality and Flexibility subscales. Fluency is measured by the number of relevant ideas to the picture. Originality is measured by the unusualness of the ideas. Flexibility is measured by the variety of different types of ideas (Kim 2006).

Each activity takes five minutes, except for the fourth and fifth ones which take ten minutes each. Hence, the entire TTCT take around 45 minutes in total.

- **Activity 1 (Asking):** In this activity, the test-taker is required to ask questions about the displayed picture which represents a certain incident.
- **Activity 2 (Guessing Causes):** In this activity, the test-taker is required to guess the possible causes leading to the incident represented in the previous picture.
- **Activity 3 (Guessing Consequences):** In this activity, the test-taker is required to guess all the possible immediate and remote consequences of the incident.

- **Activity 4 (Product Improvement):** In this activity, the test-taker is required to represent their opinions and propose as many suggestions as possible to improve a children's toy to make it more fun and exciting to children.
- **Activity 5 (Unusual Uses):** In this activity, the test-taker is required to mention all the possibly unusual uses of carton boxes.
- **Activity 6 (Unusual Questions):** In this activity, the test-taker is required to think of a number of questions about carton boxes with the one condition, that these questions would eventually lead to several and variable answers.
- **Activity 7 (Just Suppose):** In this activity, the test-taker is confronted with an improbable situation and asked to predict the possible outcomes of that situation.

Al-Nafie (2008) validated the TTCT's content and criterion for the Saudi environment. While reliability has been calculated by the split-half method using the Spearman-Brown prediction formula with stability values between 0.64 and 0.90 in Fluency, Originality and Flexibility subscales.

B. Data Collection and Statistical Analysis

The data were analyzed using SPSS v.23. Analytic techniques included correlation Pearson Correlation Coefficient, T-Test, One-way analysis of variance (ANOVA), Scheffe Test and Simple Regression Analysis.

IV. RESULTS

A. Hypothesis 1

The results show that there is a statistically significant relationship between QOL and Creative Thinking (CT) in the study's samples. The results are shown below in Table II.

Table II. The Pearson Correlation Coefficient Between QOL and Creative Thinking (CT) (264)

QOL Scale		CT Scale			
		Originality	**Flexibility**	**Fluency**	**Total Degree of CT**
General Health	Pearson Correlation	0.209**	0.105	0.190**	0.191**
	Sig. (2-tailed)	0.001	0.090	0.002	0.002**
Family and Social life	Pearson Correlation	0.003	0.188**	0.254**	0.220**
	Sig. (2-tailed)	0.955	0.002	0.000	0.000
Education	Pearson Correlation	0.254**	0.375**	0.412**	0.416**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000
Emotional Well-being	Pearson Correlation	0.220*	0.279**	0.347**	0.343**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000
Mental Health	Pearson Correlation	0.164**	0.224**	0.303**	0.290**
	Sig. (2-tailed)	0.007	0.000	0.000	0.000
Time Management	Pearson Correlation	0.059	0.040	0.013	0.010
	Sig. (2-tailed)	0.337	0.517	0.831	0.873
Total Degree of QOL	Pearson Correlation	0.221*	0.285**	0.374**	0.364**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000

**. Correlation is significant at the 0.01 level (2-tailed).

Table II shows an initial positive correlation between "General Health" and "Fluency", "Originality" and the total degree of CT. This is also present in the correlation between "Family and Social life" with "Fluency" and "Flexibility" and the total degree of CT.

A statistically significant correlation is measured between "Education", "Emotional Well-being", "Mental Health" and the total degree of QOL on the scale of CT which is presented in Table 2. However, regardless of the positive correlation between "Time Management" and the total degree of QOL on all the scales of CT (Originality, Flexibility and Fluency), this relationship did not live up to the level of statistical significance.

Table III. The Results of T-Test for QOL Scale According to Father's Education

QOL Scale	Father's Education	N	Mean	Std. Deviation	T	DF	Sig. (2-tailed)
General Health	High-school Diploma or Below	70	38.38	1.82	3.018	262	0.003
	University Education and Higher	194	37.15	3.11			
Family and Social life	High-school Diploma or Below	70	46.80	3.56	5.167	262	0.000
	University Education and Higher	194	44.28	3.48			
Education	High-school Diploma or Below	70	39.43	6.58	3.120	262	0.002
	University Education and Higher	194	37.13	4.72			
Emotional Well-being	High-school Diploma or Below	70	34.68	5.87	0.122	262	0.903
	University Education and Higher	194	34.59	4.86			
Mental Health	High-school Diploma or Below	70	39.69	4.93	1.127	262	0.261
	University Education and Higher	194	38.91	4.97			
Time Management	High-school Diploma or Below	70	35.03	2.28	4.753	262	0.000
	University Education and Higher	194	32.14	4.88			
Total Degree of QOL	High-school Diploma or Below	70	233.97	20.40	3.820	262	0.000
	University Education and Higher	194	224.22	17.51			

Table IV. The Results of T-Test for QOL Scale According to Mother's Education

QOL Scale	Mother's Education	N	Mean	Std. Deviation	T	DF	Sig. (2-tailed)
General Health	High-school Diploma or Below	82	36.88	2.52	-2.27	262	0.024
	University Education and Higher	182	37.74	2.98			
Family and Social life	High-school Diploma or Below	82	45.51	3.15	1.687	262	0.093
	University Education and Higher	182	44.69	3.86			
Education	High-school Diploma or Below	82	37.56	6.40	-0.369	262	0.713
	University Education and Higher	182	37.82	4.84			
Emotional Well-being	High-school Diploma or Below	82	32.93	5.63	-2.684	262	0.000
	University Education and Higher	182	35.38	4.71			
Mental Health	High-school Diploma or Below	82	38.32	5.71	-1.759	262	0.080
	University Education and Higher	182	39.47	4.55			
Time Management	High-school Diploma or Below	82	34.78	5.04	4.685	262	0.000
	University Education and Higher	182	32.06	4.02			
Total Degree of QOL	High-school Diploma or Below	82	225.97	22.93	-0.480	262	0.632
	University Education and Higher	182	227.17	16.64			

Table V. Results of Analysis of Variance (ANOVA) Test of QOL According to Students Educational Level

QOL Scale		Sum	DF	Mean	F	Sig.
General Health	Between Groups	357.89	2	178.94	25.89	0.000
	Within Groups	1803.87	261	6.91		
	Total	**2161.76**	**263**			
Family and Social Life	Between Groups	51.85	2	25.93	1.94	0.146
	Within Groups	3485.40	261	13.35		
	Total	**3537.26**	**263**			
Education	Between Groups	1761.21	2	880.61	39.65	0.000
	Within Groups	5797.27	261	22.21		
	Total	**7558.48**	**263**			
Emotional Well-being	Between Groups	305.86	2	152.93	6.02	0.003
	Within Groups	6628.26	261	25.39		
	Total	**6934.12**	**263**			
Mental Health	Between Groups	111.70	2	55.85	2.29	0.103
	Within Groups	0 6354.89	261	24.35		
	Total	**6466.59**	**263**			
Time Management	Between Groups	126.99	2	63.49	3.15	0.045
	Within Groups	0 5262.82	261	20.16		
	Total	**5389.82**	**263**			
Total Degree of QOL	Between Groups	8423.04	2	4211.52	13.03	0.000
	Within Groups	84362.71	261	323.23		
	Total	**92785.76**	**263**			

B. Hypothesis 2:

The results show that there are statistically significant differences between the average QOL with all its domains in the samples of the study according to the variable level of parents' education. The results are shown in Tables III and IV above.

It is clear from Table III that there are statistically significant differences according to the educational level of the father between the average scores of the study sample in the total degree on the QOL and the dimensions of "General Health", "Family and Social life", "Education" and "Time Management" in favor of "High-school Diploma or Below". Yet "Emotional Well-being" and "Mental Health" did not live up to the level of statistical significance.

It is clear from Table IV that there are statistically significant differences according to the educational level of the mother between the average scores of the study sample in the total degree of the QOL and the dimensions of "General Health" and "Emotional Well-being" in favor of "University Education and Higher". Yet the total degree of QOL, "Family and Social life", "Education" and "Mental Health" did not live up to the level of statistical significance.

C. Hypothesis 3:

The results show that there are statistically significant

differences between the average QOL with all its domains in the samples of the study according to the Students Educational Level (First-Second-Third). The results are shown in Table V above and Table VI below.

It is clear from Table V that there are statistically significant differences according to the educational level of the students (Sample) between the average scores of the study sample in the total degree on the QOL and the dimensions of "General Health" "Education", "Emotional Well-being" and "Time Management". Yet the total degree of "Family and Social life", and "Mental Health" did not live up to the level of statistical significance.

To identify the direction of the functional differences, the Scheffe Test was used. Table VI below illustrates these results.

It is clear from Table VI that there are statistically significant differences according to the educational level of the students (Sample) between the average scores of the study sample in the total degree on the QOL and the dimensions of "General Health" "Education", "Emotional Well-being" in favor of "The First Grade". Yet the total

degree of "Time Management" did not live up to the level of statistical significance.

D. Hypothesis 4:

The results show that there are statistically significant differences between the average degree of CT with all its dimensions in the samples of the study according to the Academic Level of the Parents (High School Diploma or Below - University Education and Higher). The results are shown below in Tables VII and VIII.

It is clear from Table VII that there are statistically significant differences according to the educational level of the Father between the average scores of the study sample in "Fluency" in favor of "High-School Diploma or below". Yet the total degree of "Flexibility", "Originality" and the Total Degree of CT did not live up to the level of statistical significance.

It is clear from Table VIII that there are statistically significant differences according to the educational level of the Mother between the average scores of the study sample in the Total Degree of CT with all its domains (Fluency – Flexibility – Originality) in favor of "University Education and Higher".

E. Hypothesis 5:

The results show that there are statistically significant differences between the average degree of CT with all its dimensions in the samples of the study according to the Students Educational Level (Samples) (First – Second – Third). The results are shown in Tables IX and X below.

It is clear from Table IX (in Appendix IV) that there are statistically significant differences according to the Students educational level (Samples) between the average scores of the study sample in the Total Degree of CT with all its domains (Fluency – Flexibility – Originality).

To identify the direction of the functional differences, the Scheffe Test was used, and Table X below illustrates these results.

Table VI. Post Hoc Tests Results of QOL According to Students Educational Level

Dependent Variable	Grade		Mean	DF	Std.	Sig.
General Health	1	2	38.81	2.72*	0.38	0.000
	2	3	36.09	-1.13*	0.42	0.027
	3	1	37.22	-1.58*	0.40	0.001
Education	1	2	39.50	5.41*	0.68	0.000
	2	3	34.09	-5.57*	0.75	0.000
	3	1	39.67	0.17	0.72	0.974
Emotional Well-being	1	2	34.50	1.04	0.73	0.360
	2	3	33.45	-2.77*	0.80	0.003
	3	1	36.22	1.72	0.77	0.085
Time Management	1	2	33.77	1.41	0.65	0.099
	2	3	32.36	0.03	0.71	0.999
	3	1	32.33	-1.44	0.69	0.116
Total Degree of QOL	1	2	230.96	12.14*	2.60	0.000
	2	3	218.82	-11.73*	2.86	0.000
	3	1	230.55	-0.41	2.76	0.989

Table VII. Results of T-Test for CT Scale According to Father's Education

	Father's Education	N	Mean	Std. Deviation	T	DF	Sig. (2-tailed)
Fluency	High-school Diploma or Below	70	75.46	35.18	2.84	262	0.005
	University Education and Higher	194	64.39	24.89			
Flexibility	High-school Diploma or Below	70	31.91	10.31	0.25	262	0.803
	University Education and Higher	194	31.59	8.99			
Originality	High-school Diploma or Below	70	12.77	8.67	-0.46	262	0.646
	University Education and Higher	194	13.21	5.96			
Total Degree of CT	High-school Diploma or Below	70	120.14	50.22	1.94	262	0.053
	University Education and Higher	194	109.18	36.29			

Table X shows that there are statistically significant differences according to the student's educational level between the average scores of the study sample in the Total Degree of CT as well as "Flexibility" and "Fluency" in favor of "The Third Grade". Yet the total degree of "Originality" was in favor of "The First Grade".

F. Hypothesis6: Creative Thinking can be predicted by the QOL.

To validate this hypothesis, the simple linear regression

method was used on the basis that the QOL variable is the independent variable, and that the innovative thinking is a dependent variable. Table XI and Table XII show the results of these analyses.

It is clear from the Table XII that the regression constant is statistically significant at (0.05) and that there is a statistically positive effect at (0.05) level of QOL on CT, where the value of beta coefficient is 0.36 positive value proving that CT can be predicted by QOL

Discussion

Creative people are the means for a country to remain competitive, no less so than for Saudi Arabia. The Kingdom has immense natural resources, and this extends to its human capital: exceptional people who are necessary to assist its growth and harness its potential for the 21st century. This growth requires knowledge and skills from all Saudis in order to maintain and advance the country's position in the global community.

This research was motivated to achieve just that: research that would help nourish the creative minds of this nation. Understanding the qualities required and proper environment for those young minds to become more creative and unleash their creativity comprises the whole purpose of this study. The reason we particularly chose adolescence is that it's an age of struggle during which cognitive, physical, psychological, and emotional changes take place that can affect and be affected by health and well-being. Not only that but it's the age when creativity could either be developed or disappear forever. Previous research showed evidence that adolescence is a crucial period for the development of cognitive abilities (Casey, Jones & Hare, 2008; Steinberg, 2005).

The research studied the relation between QOL with all of its six domains (general health, family and social life, education, emotional well-being, mental health and time management) and the three axes of CT (fluency, flexibility and originality). And the findings proved that QOL determines the level of creativity.

For the students sampled, there was a significant increase in all three axes of CT in students whose mothers have a university degree and above, and fathers with high-school diploma or below. These findings prove that the overall environment in adolescents' lives contributes to providing an appropriate QOL that will play a part in creative thinking. These findings shed light on the importance of the QOL provided by the parents not only on social or health levels but also on the educational levels of both parents. The higher education they have, the higher the chances are of their having a creative child.

When the simple linear regression method was used on the basis that the QOL variable is the independent variable, and that Innovative thinking is a dependent variable, the results showed that the regression constant is statistically significant at (0.05) and that there is a statistically positive effect at (0.05) level of QOL on CT, where the value of beta coefficient is 0.36 proving that CT can be predicted through the QOL.

This simply means that the influences of family, social relations, health, emotional feelings and mental health are all variables and when they provided for properly, a creative thinker's mind is highly likely to be found as well. As those variables were found to provide an environment that would significantly affect, nourish and provide a fertile space for nurturing CT in adolescents.

The findings and observations of this research were consistent with previous findings of (Kazim and El-Bahaadly, 2007), which showed that the quality of a student's life especially family relations, and social life is correlated and affects their creativity and innovation. This implies the primary effect of family on the creativity level of their child.

Table VIII. Results of T-Test for CT Scale According to Mother's Education

	Mother's Education	N	Mean	Std. Deviation	T	DF	Sig. (2-tailed)
Fluency	High-school Diploma or Below	82	56.90	28.42	-4.13	262	0.000
	University Education and Higher	182	72.02	27.10			
Flexibility	High-school Diploma or Below	82	28.93	9.93	-3.26	262	0.001
	University Education and Higher	182	32.91	8.82			
Originality	High-school Diploma or Below	82	9.27	5.40	-6.64	262	0.000
	University Education and Higher	182	14.81	6.63			
Total Degree of CT	High-school Diploma or Below	82	95.09	39.62	-4.74	262	0.000
	University Education and Higher	182	119.75	38.83			

Table IX. Results of Analysis of Variance (ANOVA) Test of CT According to Students Educational Level

QOL Scale		Sum	DF	Mean	F	Sig.
Fluency	Between Groups	14462.76	2	7231.38	9.59	0.000
	Within Groups	196879.22	261	754.33		
	Total	211341.96	263			
Flexibility	Between Groups	1955.59	2	977.79	12.15	0.000
	Within Groups	21006.39	261	80.48		
	Total	22961.98	263			
Originality	Between Groups	1249.76	2	624.88	15.09	0.000
	Within Groups	10808.05	261	41.41		
	Total	12057.82	263			
Total Degree of CT	Between Groups	21873.73	2	10936.86	6.92	0.001
	Within Groups	412588.09	261	1580.79		
	Total	434461.82	263			

Table X. Results of Post Hoc Tests of CT according to Students Educational Level

Dependent Variable	Grade		Mean	DF	Std.	Sig,
Fluency	1	2	61.13	-3.86	3.98	0.624
	2	3	65.00	-14.11*	4.36	0.006
	3	1	79.11	17.97*	4.21	0.000
Flexibility	1	2	28.79	-3.12	1.29	0.058
	2	3	31.91	-3.65*	1.43	0.040
	3	1	35.55	6.77*	1.37	0.000
Originality	1	2	15.69	4.96*	0.93	0.000
	2	3	10.72	-1.49	1.02	0.345
	3	1	12.22	-3.47*	0.99	0.002
Total Degree of CT	1	2	105.61	-2.02	5.76	0.940
	2	3	107.64	-19.25*	6.32	0.010
	3	1	126.89	21.27*	6.09	0.003

Table XI. Results of the Simple Regression Analysis of the Effect of QOL on the CT of the Samples N=264 (ANOVA)[b]

Model	Sum	DF	Mean	F	Sig.
Regression	57443.97	1	57443.97	39.92	0.000[a]
Residual	377017.85	262	1438.99		
Total	434461.82	263			

a. Predictors: (Constant), QOL
b. Dependent Variable: CT

Table XII. Results of the Simple Regression Analysis of the Effect of QOL on the CT of the Samples N=264

Model	Un-standardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std.	Beta		
Constant	-66.36	28.34		-2.34	0.020
QOL	0.787	0.125	0.364	6.32	0.000

a. Dependent Variable: CT

Conclusion

Having analyzed the effect of QOL on CT and how it may contribute in either developing or demolishing this quality, with tests applied on the student sample.

To conclude, the present work provides initial evidence that CT can be predicted through the QOL, which on both family educational levels has a great impact on adolescents' talents in general and Creativity in particular. This is why The Kingdom should pay more efforts to level up with the economic and social level of the families in general which will help raise the quality of individual's life and CT in return.

This study may serve as a foundation for future empirical studies that could generate strategies to improve the innovation practices in Saudi Arabia. The research and its possible evolutions could give a substantial contribution to the future of developing a new generation of future minds that could lead this Nation to a better future.

V. Limitations

Future research needs to confirm and extend our results also considering the present study limitations. This study

was limited to a certain age group and gender – Middle School Female Students aged between 12 and 15.

Additional research should be developed for male subjects, as well as other age groups, and subjects of different social and educational status and any other demographic difference. This could be important to track changes through age and to verify if QOL can affect creativity levels and in which ways. Moreover, it could be interesting to assess such variables through a longitudinal study, to monitor the effects of the training and the progress of CT step by step, as well as other possible variables of interests such as family's demographics, but also children's personality.

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