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# The Relationship Between Problem Solving and Creative Thinking Skills among Nursing Students

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ABSTRACT

The aim of this study is to determine the relationship between problem solving and creative thinking skills among nursing students. This is a cross-sectional and correlational study. The sample was composed of 266 nursing students who were assessed on the creative thinking scale and problem solving inventory. The problem solving capability of students increase statistically significant levels as the grades of the students increase. The average score students get from creative thinking scale, did not show any difference due to the level of grade and all students obtained scores to be defined as "over the average creativity". There was a moderately significant negative correlation between the scores of the two scales employed by the study. Especially higher scores on problem solving for the senior nursing students in comparison with others, is an important result proving nursing education has a positive effect on problem solving.

Keywords:
*Creative thinking, nursing, problem solving, student*

## 1.Introduction

Problem is defined as a situation which requires investigation, learning, thinking, analyzing and solving, while problem solving is defined as a multi-dimensional skill that require conscious efforts (Turkish Language Society [TDK], 2016; Tok and Sevinç, 2010; Eskin, 2009). The factors that affect problem solving are determined as intelligence, customs, social expectations, self-confidence, skills to think as well as level of creativity (Gomez, 2007; Otacıoğlu, 2007; Özer et al., 2009). Today considering changing health care requirements, the profession of nursing requires individuals who are creative with researcher characters, who have access to information, who produces and uses information. Expanding of creativity facilitates improvement of contemporary nursing applications and nursing care, also increases the problem solving (Şen et al., 2013). One of the effective ways to increase welfare level and life quality is to have the skill of creative thinking and skill to find creative solutions to problems.

Nurses have to face with many problems in implementation area. One of the most important factors to determine the safety and quality of the care delivered by nurses is the skills of problem solving. It is expected from the nurses who have to work with individuals with different problems in clinical environment, to have high skills of problem solving (McEwen and Brown, 2002). The developed and adequate problem solving skills of nurses, are the requirement of their liabilities of preventing harm and protecting lives of individuals they provide health care (Abaan and Altıntoprak, 2005). Nurses can able to serve efficient service in favor of increasing life quality and protecting and improving public health in case they can raise themselves as individuals with effective problem solving skills. Individuals with high skills of problem solving are generally

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defined as creative, innovative, open to criticism, and open to changes (Nezu and Nezu, 2001). These specifications which individuals with high skill of problem solving have, at the same time coincides with the professionals skills expected from a professional nurse. Thus, one of the most important outputs of nursing education is the improving the students' problem solving skills (Abaan and Altıntoprak, 2005). In the studies executed in order to determine the problem solving skills of nursing students, it is determined that problem solving skills of the students are at average level and problem solving skill of first year students is lower than second, third and fourth grade students (Yurttaş and Yetkin, 2003; Gönülal and Bahar, 2005; Günüşen and Üstün, 2011).

A person's knowledge on problem solving, is not enough for him to solve all problems he faces with. Producing creative solutions towards the problem is as important as high problem solving skills. While some problems have adequate and certain, definite solutions, some others may have not (Mertoğlu and Öztuna, 2004). Creative thinking, which plays an important role in development of society and humankind, within a large scope diverging from daily life to scientific studies, can be defined as presenting a unique product at the end of the process (Argun, 2004; Çetin et al., 2015; Yıldırım, 2007). Creativity of creative thinking; can be defined as seeing the differences while looking at the same thing people look at, a new attitude of acceptable behavior other than usual things and patterns, ability to present a new thinking process or a new product (Dolgun and Erdoğan, 2012). Societies composed of individuals with developed thinking skills as well as creative skills, plays a crucial role adopting the world's conditions, determining the power and direction of the change and contributing to such change (Çetin et al., 2015). Thus, what is expected from education is the contribution to emerging of individuals with independent thinking skills, who may solve problems, with problem solving skills (Emir et al., 2007).

There are limited numbers of studies with nursing students on effect of creative thinking as an effective variable in problem solving. Determining of creative thinking and problem solving skills levels of nursing students is necessary for planning and developing initiatives towards this area.

### 1.1. Research Questions

1. What is the level of creative thinking skills of nursing students?
2. What is the level of problem solving skills of nursing students?
3. Is there any relationship between nursing students' problem-solving skills and creative thinking skills?

## 2. Method

### 2.1. Purpose and Study Design

The aim of this study is to describe the level of creative thinking and problem solving skills among nursing students and to examine their relationship with creative thinking and problem solving skills. The cross-sectional, descriptive and correlational design was used.

### 2.2. Participants

The cross-sectional, descriptive and correlational study was conducted between September 2015 and April 2016 in Mehmet Akif Ersoy University, Faculty of Health Sciences in Burdur, Turkey. Convenience sampling methods were used. Fifteen students refused to participate. Participants were first, second, third and fourth year undergraduate students (n=266) in the Bachelor of Nursing Science Degree in the academic term of 2015–2016.

### 2.3. Instruments

#### 2.3.1. Demographic characteristics

This form is comprised of three questions regarding students' socio-demographic characteristics: Age, sex, level of class.

### 2.3.2. Creative thinking skills scale

The scale which was developed by Whetton and Cameron (2002) in order to determine the creativity levels of individuals is adopted to Turkish as "Creative Thinking Skills Scale" by Aksoy (2004). The scale is a likert type scale with "I do agree", "I do not agree" and "I am undecided" alternatives and composed of 40 articles each of which has different scoring. The articles in the scale has minimum -2, and maximum 4 points (Aksoy, 2004). Point intervals between 0-9 are defined as non creative, 10-19 are creative under the average, 20-39 are defined as creative at the average level, 40-64 points are defined as creative over the average, 65-94 points are defined as very creative and 95-116 points are defined as extraordinary creative. Increasing of total scores means the increase at the levels of creativity (Aksoy, 2004).

### 2.3.3. Problem solving skills inventory (PSSI)

This 35-item inventory used to measure individuals' own perception of problem-solving skills was developed by Heppner and Petersen (1982). The PSSI consists of 35 items and three factors. The first of these factors is problem-solving confidence (11 items), the second one is avoidance of/approach to the problem (16 items), and the third one is control (15 items). The Cronbach's alpha reliability coefficient of the original scale was 0.90. The coefficients for the subscales ranged between 0.72 and 0.85. The test–retest reliability coefficients of the subscales ranged between r = 0.83 and r = 0.89 (Sahin & Heppner, 1993). The scale is a 1–6 point Likert-type scale (from "I always act (behave) this way" to "I never act (behave) this way.") and can be applied both to adolescents and to adults. Whereas items 9, 22, and 29 are not scored, items 1, 2, 3, 4, 11, 13, 14, 15, 17, 21, 25, 26, 30, and 34 are reversely scored. The reliability and validity of the Turkish version of the scale was conducted by Sahin and Heppner (1993). The Cronbach's alpha reliability coefficient of the scale was determined as 0.88. The lowest and highest possible scores to be obtained from the scale are 32 and 192, respectively. There are no cutoff points in the evaluation of the scale. Lower scores obtained from the PSSI indicate high problem-solving skills, whereas higher scores indicate poor problem-solving skills. In this study, the reliability coefficient of the scale was determined as 0.81.

### 2.4. Data Collection

The questionnaires were distributed during class hours, and students were asked to complete and return them at the end of the lesson. The questionnaires were collected by the author after they were completed.

### 2.5. Data Analysis

For data analysis, the SPSS 17.0 software (SPSS, Inc., Chicago, IL, USA) was used. A test of hypothesis with p value of $<0.05$ was considered significant. Descriptive statistics were used to determine students' characteristics. The relationship between problem-solving skills and creative thinking skills was examined with Pearson's correlations. The statistic 'r' value of 0.00 to 0.24 was considered a weak relationship; 0.25 to 0.49 was a moderate relationship; 0.50 to 0.74 was a strong relationship; and 0.75 to 1.00 was a very strong relationship (Aksakoğlu, 2006).

### 2.6. Ethical Consideration

Written permission from Mehmet Akif Ersoy University Ethical Committee (GO 2016/2-6) and the Mehmet Akif Ersoy University Faculty of Health Sciences was also obtained. The objective of the research was explained to the participants and written permission was received from those agreeing to participate in the research.

## 3. Results

The average age of the attendant students is 20.87 ± 1.61, 66.9% of them female, 30.1% of them are at the first grade.

Table 1. Comparison of nursing students' scores regarding their creative thinking skills (n: 266)

| Level of class | n | Mean scores for creative thinking X ± SD | Min-Max | F | p |
|---|---|---|---|---|---|
| 1st year | 80 | 42.05±14.33 | 17-78 | 2.526 | 0.058* |
| 2nd year | 69 | 43.88±14.21 | 24-82 | | |
| 3rd year | 55 | 49.23±16.99 | 26-84 | | |
| 4th year | 62 | 44.48±15.43 | 13-80 | | |

*p > 0.05

The creative thinking skills scores of the students are determined by using single dimensional variance analysis. Difference among classes are not determined statistically meaningful (F = 2.526, p = .058) (Table 1). The highest creative thinking skills scores are obtained in third grade students.

**Table 2.** Comparison of nursing students' scores regarding their problem-solving skills (n: 266)

| Level of class | n | Mean scores for problem-solving skills X ± SD | Min-Max | F | p |
|---|---|---|---|---|---|
| 1st year | 80 | 99.36±11.60 | 68-132 | 26.356 | 0.000* |
| 2nd year | 69 | 96.69±14.06 | 53-126 | | |
| 3rd year | 55 | 93.21±19.74 | 58-138 | | |
| 4th year | 62 | 77.03±18.34 | 54-114 | | |

*p < 0.05

Problem solving skills scores of the students are determined due to their class levels by using single dimensional variance analysis. Difference between classes are determined statistically meaningful (F = 26.356, p = .000) (Table 2). It is determined that, scores of the fourth grade students are meaningfully higher than first, second and third grade students and the difference derives from the scores of fourth grade students (Table 2).

A negative, statistically meaningful relation at low level is determined in relation between creative thinking and problem solving skills scores of the students (r = -.172, p = .005) (Table 3).

**Table 3.** Relationship between creative thinking and problem-solving skills of nursing students (n: 266)

| Mean scores for creative thinking | Mean scores for problem solving skills | r | p |
|---|---|---|---|
| X ± SD | X ± SD | - 0.172 | 0.005* |
| 44.57±15.27 | 92.19±17.96 | | |

*p < 0.01

## 4. Discussion

It was determined that, the average scores of the students from creative thinking skill scale does not show a difference at class level, all class averages are at 40-64 points interval; thus all of them are considered in "creative over the average" group. It was determined that third grade students had the highest average points among the classes. It is only that there are only a few numbers of studies in literature on creativity of nursing (Ku et al., 2010; Chan, 2013). In the systematic evaluation of creativity in nursing exercised by Chan (2013), it is stated that some people are more creative than the others although creativity skills can be improved with education. For nursing students to be directed towards creative thinking, the trainers and administrators in education should direct students to their areas of interests and activities. It is stated that, trainers in education should steer students to activities such as poetry, role playing, music and sculpture in order to improve their creativity skills (Chan, 2013).

Executed studies prove that, providing varieties in education, supporting of independent education, learning in group studies by trusting others, facilitate the creativity (Emmanuel et al., 2010; Hall and Mitchell, 2008; Lillyman et al., 2011; Hydo et al., 2007). Furthermore, in the studies executed by Karataş and Özcan (2010) about effect of creative thinking activities on students' creative thinking and project development, it was determined that, methods such as brain storming and concept map contribute to the creative thinking of the students. It is stated that creativity has been an individual process and very different methods can be tried in order to improve creative thinking. For instance, it is stated that staying out of current rules, stating new thoughts against the generally accepted norms, having communication with new people other than people you interact with in your daily life, and staying away from classical thinking patterns, may increase point of view and creativity of individuals (Dolgun and Erdoğan, 2012). In order to develop creativity in nursing education, firstly environments, in which creativity is encouraged and promoted, should be emerged. In order to think creative, first the individual should be aware of creativity, than should be encouraged to creative thinking. The success in developing creativity is mostly dependent on learning about the subject of creativity (Tulum and Memiş, 2006). Like in all educational systems, in also nursing education, trainers as the most important corner stones of education have significant liabilities. Some behaviors and attitudes of trainers that take place in education process have important effects on emerging and developing of creativity (Tulum and Memiş, 2006). While searching for studies on creativity of nursing students, we were unable to reach any research articles. Nurses, operating in fast changing, developing and complicated structure, as being a member of profession, have to be individuals who may able to adopt changes and innovations, solve problems by using creative thinking, who can question, who can contribute to his profession by being affected from different disciplines and who may also think with criticism (Bahar, 2006). Thus, it is extremely important to use creative thinking in order to see possible results of nursing and to find valid answers and to expose creative actions as the nature of being professional (Şen et al., 2013).

Due to the findings of study, problem solving skill is observed at the highest level in fourth grades, the lowest in the first grade students. Problem solving skills of the students that attend to study increase as the levels of grade increase. In the literature, there are studies on changes in problem solving skills due to levels of grade have different solutions (Günüşen and Üstün, 2011; Beşer and Kıssal, 2009; Durmaz et al., 2007). Different from these studies, there are also studies pointing out that levels of grades of students have no effect on problem solving skill (Altun, 2003; Tezel et al., 2009).

In the study executed by Batıgün and Kayış (2014) on stress factors in university students and problem solving skill, it is determined that individuals with high stress factors have lower problem solving skills. Total score of problem solving skill is determined as 97.94±15.73. This result shows parallelism with the result of our study in terms of average points. In the study executed by Yıldırım and friends (2011) on determining high school students about problem solving skills and effective factors, the average problem solving skill of the students is determined as 89.91±19.77. It is stated that, since problem solving skills are teachable and improvable cognitive skills, at every area of educational process, they should be stressed on (Yıldırım et al., 2011). In the study of Abaan and Altıntoprak (2005) in which problem solving skills of nurses were evaluated, problem solving inventory average score had been determined as 77.48 ± 14.75. Since the nursing students have very high average scores in our study, it is thought that nurses solve problems better that the nursing students. In the study of Kanbay and friends (2013) in which problem solving and critical thinking skills of nursing post graduate students, average total problem solving skill is determined as 92.45 ± 1.29. Although differences are

observed in problem solving skill average scores among classes, this difference was not found meaningful (p>0.05). The result of the study shows parallelism with our average scores (92.19 ± 17.96), but there are differences in terms of there are no differences among grades. Inadequacy of problem solving skill that improves the quality of nursing care, affects negatively the quality, professionalism in work, autonomy and having the power (Abaan and Altıntoprak, 2005). Thus, problem solving skills of the nurses should be developed throughout the education process (Günüşen and Üstün, 2011). In the study of Tok and Sevinç (2010) which examined the effect of education on critical thinking and problem solving skill, it is determined that problem solving skill scores of the students decreased after the education given. Within this context, it is determined that education has positive effects on problem solving skill.

There is statistically weak and meaningful relation between creative thinking and problem solving skill. According to the average scores of the students that attend to our study, it is determined that students have over average creativity. As a result of the comparison between grade levels, third grade students obtained the highest average points while first grade students had the lowest scores. Within this context, creativity levels in the order are third grade, fourth grade, second grade and first grade. Furthermore, the highest average on problem solving is the fourth grade, while the lowest scores belong to first grade. Within this context, even at low level, a relation between creativity levels of students and problem solving has been determined and it is also determined that as the level of grade increases, students may think more creative and may solve problems easier. Within this context, it is believed that education has positive effect on creative thinking and problem solving. Student with creative thinking may easily notice the problems ad may bring creative solution alternatives. Thus, he/she knows what to do when she faces with a problem, she may produce appropriate methods to solve problems and may ring creative solution alternatives. Since any study evaluating the relation between creative thinking and problem solving has not been reached in literature, this issue cannot be discussed.

**5. Conclusion, Study Limitations and Implications for Nursing Knowledge**

As the result of this study, it is determined that, creative thinking skill and problem solving skills of the students increase as the levels of grades increase. Furthermore, it is determined that, average points of problem solving skill of fourth grade students are high, students have over the average creativity scores. Nurses, while undertaking their roles and liabilities in presenting health services, should be aware of their creativity in order to contribute professional improvement as health discipline, to facilitate adaptation to new technologies and practices, to expedite nursing care and they also have to improve and expose their characteristics (Şen et al., 2013). The creative thinking and problem solving skills of the nursing students can be improved by applying creativity increasing practices at schools and faculties. Making comparisons of nursing students with the students in other disciplines may also help to expose the contribution of nursing education (Günüşen and Üstün, 2011). Making of further studies on creative thinking among nurses and students of nursing education is suggested in order to expose the relation between creative thinking and problem solving skills.

This research should be evaluated more extensively with a larger sample. In the future, qualitative studies can be conducted in order to find out how creative thinking affects problem solving skills.

It is important for students to assess their creative thinking and problem solving skills. Since the high creative thinking of control may affect the problem solving skills, it is important to develop a curriculum and strategies which aim to improve the undergraduate nursing students' problem solving skills and creative thinking skills.

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