Original Article

The Relationship between Critical Thinking Disposition and Problem Solving Skills in Nurses

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Abstract

Objective: The aim of the study was to investigate the relationship between critical thinking disposition and problem solving skills in nurses.
Material and method: The research was a descriptive and correlation type. The research was carried out at a private hospital in the city of İstanbul in Turkey between April and July 2018. The study sample included 172 nurses. In the study, Nurse Information Form, California Critical Thinking Disposition Scale and Problem Solving Inventory were used to gather data.
Results: In the study 52.9% of nurse were 23-27 years old (age mean: 26.16±6.25), 69.8% of them had baccalaurete and graduate education, 75.6% of them have worked in service inpatient, 82.6% of them have worked for 5 years or less than it. It was determined that the total mean score of Critical Thinking Disposition nurses was 195.77±25,70, average total problem solving skills scores were 111.76±16.52. It was determined that there was a significantly moderate relationship between the nurses' critical thinking disposition and their problem solving skills ($r=0.414$, $p<0.001$).There was a statistically significant difference between the age of the nurses and their problem solving skills ($p<0.05$). There was no statistically significant difference between the other variables of the nurses (gender, educational background, etc.) and their critical thinking dispositions and problem solving skills ($p>0.05$).
Conclusion: Critical thinking disposition of nurses were low level and their problem solving skills were moderate level. The relationship between the nurses' critical thinking disposition and their problem solving skills was a significantly moderate level.

Key words: Nurse, critical thinking, problem solving

Introduction

The skills of nurses in the 21st century enable effective and safe care in a complex relationship of critical thinking and the current health system. Critical thinking is targeted and analytical thinking which is necessary for clinical decision-making processes in nursing (Hung, Tang & Ko 2015). At the same time, this brings out multi-directional questions, and their solutions emphasize the critical process (Simpson & Courtney 2002; Hung, Tang & Ko 2015). A concept relating to critical thinking is problem solving (Simpson & Courtney 2002; Perez et al. 2015; Jacob, Duffield & Jacob 2017). Problem solving is defined as a person's ability to produce effective and suitable solutions to problems encountered in daily life using cognitive-behavioral processes (Maguire 2001). The problem solving approach enables an individual or a group to focus on something in order to develop a skill. In this way, the skill of problem solving plays an important role in the development of both critical thinking and

creative thinking (Seymour, Kinn & Sutherland 2003; Citak & Uysal 2012).

Nursing is a professional occupation which is involved with life in every sense, and covers human health and illness. In every area of our profession, we may encounter all kinds of different problems, and it is necessary for us to use critical thinking to solve these problems. It is accepted that the skill of critical thinking is among the basic skills of professional nursing. Developing the skill of critical thinking in nurses, along with manual skills which are science and evidence based and linked to theory, is effective as a discipline which uses intellectual skills (Zaybak & Erzincanli 2015). The tendency towards critical thinking in nurses has unfortunately not reached a sufficient or adequate level, because full autonomy has not been attained and problem solving skills have not been sufficiently developed. Thus it must not be forgotten that critical thinking strengthens nurses' dependent and independent decision making, develops their skill to make an analysis or synthesis relating to situations which they encounter, enables them to relate cause and effect, and has a positive effect on their professionalism, autonomy and strength (Riddell 2007; Senita 2008; Erkus & Bahcecik 2015). In this way, when practicing the nursing profession, the ability to think critically and analytically, and to act autonomously in relation to problems encountered at every level of service, will bring about quality care.

In this regard, the aim of our research was to investigate the relationship between the disposition to think critically and problem solving skills in nurses.

Material and Method

Design and sample: The research was a descriptive and correlation type. The research was carried out at a private hospital in the city of İstanbul between April and July 2018. The population of the study consisted of the 350 nurse in the hospital. The inclusion criteria for nurses were (*a*) having the position of nurse, (*b*) their willingness to participate in the research, and (*c*) working in the hospital during the research period. The study sample included 172 nurses.

Data Collection And Instruments: In the study, Nursing Information Form, the California Critical Thinking Disposition Scale and the Problem Solving Inventory were used to gather data.

Nursing Information Form: The form was 11 questions consisted of the nurses' age, gender, married status, educational level, working duration and experience in their profession.

California Critical Thinking Disposition Scale (CCTDS): The scale, developed by Facione, Facione and Giancarlo in 1994, was used in order to determine the critical thinking dispositions of the students. This scale, which was adapted to Turkish by Kokdemir (2003), was chosen since it is a favorite scale preferred in the studies on critical thinking dispositions in Turkey and was suitable for the students at university level. For the new inventory with 6 sub-scales and 51 items; the total internal consistency coefficient (alpha) was 0.88. The scale was a 6-point Likert type and evaluated in a such way that 1 point was used for "strongly disagree", 2 for " disagree", 3 for "partially disagree", 4 for "partially agree", 5 for " agree" and 6 for "strongly agree". According to CCTDS, having less than 240 scores was defined as low critical thinking disposition, having a score between 240 and 300 was defined as medium critical thinking disposition and having more than 300 scores was defined as high critical thinking disposition (Kokdemir 2003).

Problem Solving Inventory (PSI):

PSI was developed by Heppner and Peterson in 1982 (Sahin, Sahin & Heppner 1993). In this inventory, how the individual perceives him/herself in the problem solving process and what s/he thinks of the problem solving behaviour are evaluated. It consists of a total of 35 items, including three sub-inventories. The sub-inventories are related to confidence in the problem solving ability, approach avoidance and personal control. It is six point likert scale. The lowest score to be obtained from the inventory is 32, whereas the highest score to be gained is 192. In the inventory, three questions are excluded from the scoring process. This inventory is performed on adolescents and adults. The fact that the total score obtained from the inventory proves to be high suggests that the individual perceives him/herself as unproficient in problem solving, whereas the low total score suggests that the individual feels proficient in problem solving. The Turkish validity and reliability study of the inventory was performed by Sahin, Sahin & Heppner (1993). In the study conducted by Sahin

et al., the alpha reliability coefficient for the whole inventory was found to be 0.88, whereas, in our study, it proved to be 0.84.

The tools were handed out to the nurses during working times in their rest room, and were collected back by the researcher in a face-to-face interview after they had been answered. It took approximately 15-20 minutes to complete these forms.

Data Analysis: The data was analysed using number, percentage, mean, standard deviation, One Way Anova Test, Kruskal-Wallis Test, Independent Sample t testi, Pearson's Correlation Analysis in SPSS for Windows 22.0 programe. The accepted confidence interval was 95% and the significance level for all analyses was set at $p<0.05$.

Ethical Considerations: The approval of the local ethics committee of the relevant university (dated: 02.05.2018 and numbered: 20.478.486-050.050.04) and the written permission of the hospital was taken to conduct the research. The nurses were informed about the research and their written consents were taken.

Results

In Table 1, there were the relationship between nurses' characteristics with CCTDI and PSI**.** In the study 52.9% of nurse were 23-27 years old (age mean: 26.16±6.25), 79.7% of them were female, 76.7% of them were single, 69.8% of them were baccalaurete and graduate degree, 75.6% of them have worked as service nurse, 82.6% of them have worked 5 years or less than it. There was not a statistically significant difference between the age, gender, educational level, working position, working duration in professional, working shift of nurses and their critical thinking disposition ($p>0.05$). There was a statistically significant difference between the age of the nurses and their problem solving skills ($p<0.05$). There was not a statistically significant difference between the gender, educational level, working position, working duration in the profession, working shift of nurses and their problem solving skills ($p>0.05$).

It was determined that the total mean score of CCTDI nurses was 195.77±25.70, total mean score of PSI were 111.76±16.52. It was determined that there was a significantly moderate level relationship between the nurses' critical thinking disposition and their problem solving skills ($r= 0.414$, $p<0.000$) (Table 2).

Table 1. The relationship between nurses' characteristics with CCTDI and PSI (n=172)

Characteristics	**n**	**%**	**CCTDI (X±SD)**	**PSI (X±SD)**
Age				
18-22	43	25.0	198.53±22.55	106.37±14.38
23-27	91	52.9	194.62±28.68	114.91±17.97
28 ve üzeri	38	22.1	195.42±21.51	110.31±13.42
Age mean: 26,16±6,25				
F			0.340	4.242
P			0.713	**0.016***
Gender				
Female	137	79.7	194.51±25.02	113.35±15.69
Male	35	20.3	200.74±28.07	113.37±19.60
t			1.282	0.645

P			0.600	0.266
Marital Status				
Married	40	23.3	192.95±25.31	108.82±18.82
Single	132	76.7	196.64±25.86	112.65±15.72
t			-0.794	-1.286
P			0.507	0.280
Educational level				
Health vocational high school	48	27.9	199.58±24.49	110.02±16.08
Undergraduete	4	2.3	185.500±5.06	107.75±5.73
Baccalaurete and Graduate	120	69.8	194.60±26.48	112.59±16.93
kW			3.229	0.746
P			0.199	0.689
Working position				
Service nurse	130	75.6	194.26±26.22	111.93±16.41
Critical care nurse	36	20.9	200.14±24.75	110.33±17.55
Responsible nurse	6	3.5	202.50±18.03	116.67±13.42
kW			1.825	1.736
P			0.402	0.420
Working duration (year)				
1-5	142	82.6	195.99±26.83	112.42±17.11
6-10	17	9.9	198.76±18.53	109.82±15.65
11 years and more	13	7,6	189.54±21.00	107.08±9.29
kW			1.628	2.051
P			0.443	0.359
Working shift				
Day shift	67	39.0	194.96±25.01	109.06±14.62
Night and day shift	105	61.0	196.30±26.24	113.49±17.47
t			-0.335	-1.723
P			0.721	0.089

*p<0.05, F: One Way Anova test, t: Independent Samples test, kW: Kruskal-Wallis test

Table 2: The correlation between nurses' CCTDI and PSI mean scores (n=172)

Scales	Mean±sd	Min-Max	Test**
CCTDI	195.77±25,70	120-274	r=0,414
PSI	111,76±16,52	71-161	p=0,000*

*p<0,001 ** Pearson's Korelasyon

Discussion

Nurses who have the skills of critical thinking and problem solving can cope with negative feelings and thoughts and produce suitable solutions, and in this way they can raise the quality of health care service. It was found in the study that nurses' critical thinking dispositions were at a low level (195.77±25.70). In studies conducted in Turkey, it is seen that nurses' critical thinking disposition is at a low level (Erkus &Bahcecik 2015; Erzincanli & Zaybak 2015; Yildirim & Karadag 2016; Baran & Balcı 2017; Gezer, Yildirim & Ozaydin 2017; Polat et al. 2019; Saritas & Yildirim 2020). In studies conducted in other countries however, it is reported that nurses have medium-level critical thinking dispositions (Kim & Han 2016; Zuriguel-Pérez et al. 2019; Chen et al. 2020). The reason for this may be factors such as differences in education systems, work load, work dissatisfaction, individual differences, the expectation of dependent roles rather than critical thinking, and the limited nature of management approaches to support and stimulate critical thinking (Dimen & Usta 2013; Erkus & Bahcecik 2015; Baran & Balcı 2017).

In the study, it was found that nurses' problem solving skills were at a medium level (111.76±16.52), and in other studies conducted in Turkey, it is seen that nurses' problem solving skills are at a medium level (Kelleci & Gölbasi 2004; Erkus & Bahcecik 2015; Karakurt & Ekinci 2015; Yildirim & Bagsurer 2019; Yilmaz Kocak & Buyukyilmaz 2019). Studies conducted in other countries are limited, but in a study performed in Korea, it was found that nurses working in four hospitals (n=373) had medium level problem solving skills (Kim & Han 2016). It is thought that the reason why nurses do not have an adequate level of problem solving skills is that nurses in Turkey were not taught in their degree programs according to the problem-based education model, that nurses do not adequately and effectively use a nursing procedure involving problem solving skills in patient care, and that they do not make use of evidence-based approaches in solving clinical problems.

Critical thinking allows nurses to use problem solving skills correctly, to correctly determine priorities when solving problems, and to pay attention to ethical rules when making decisions (Yildirim & Tasci 2013). A correlation which was significant at a medium level was found in the study between nurses' critical thinking dispositions and their problem solving skills. With regard to the studies conducted in Turkey, a significant correlation at a low level was found in a study by Erzincanli and Zaybak (2015) between nurses' critical thinking dispositions and their problem solving skills, but Erkus and Bahcecik (2015) found no significant correlation. Kim and Han (2016) found a significant correlation at a high level between nurses' critical thinking dispositions and their problem solving skills. One of the basic aspects of critical thinking is problem solving. Problem solving skills are directly related to cognitive processes, and individuals with a high level of critical thinking skills are also good at problem solving (Erzincalı & Zaybak 2015; Kanbay & Okanlı 2017). In the formation of clinical road maps, which are a clinical management method covering all clinical care and treatment of patients, nurses are able to reach a correct decision in clinical problem solving by thinking critically (Yildirim &Tascı 2013). In this way, a positive development which will raisenurses' critical thinking levels will be reflected positively in their problem solving skills.

In the literature, factors affecting nurses' disposition to critical thinking are stated to be nurses' knowledge and experience of clinical practice, their sociodemographic characteristics (age, education level) and work environment (a stressful environment, length of working time, lack of time, staff shortage, work satisfaction), but some other studies have stated that some of these factors do not have an effect (Gezer,

Yildirim & Ozaydin 2017; Zuriguel-Pérez et al. 2018; Zuriguel-Pérez et al. 2019; Lee et al. 2020). In this study, no correlation was found between nurses' age, gender, educational level, employment position, years of work or type of work and their disposition to critical thinking. However, nurses in a position of responsibility had higher critical thinking disposition scores than nurses working in other positions. These results are similar to the literature (Erkus & Bahcecik 2015; Zuriguel-Pérez et al. 2018). In Zuriguel-Pérez et al. (2019) study was determined that nurses' critical thinking skills were related to certain socio-demographic and professional variables (age, years of experience in the present unit, shift work), and that their critical thinking skills were not considered related to gender, years of nursing working experience, work unit, years working in the present unit, type of contract and educational level (Zuriguel-Pérez et al. 2019). As nurses' education level and experience increased, as they got more opportunity to practice in the clinical environment, and as they made autonomous decisions in patient care, so their critical thinking levels also rose (Baran & Balcı 2017). However, it was seen in this study that there was no variable which affected the nurses' disposition to critical thinking. It is thought that the reason for this is that the population size was inadequate and that the nurses were young and inexperienced.

In the study, no correlation was found between the nurses' gender, education level, work position, years of working in the profession or type of work and their problem solving skills. A correlation was seen only between their age and their problem solving skills. It was found that nurses in the 23-27-year age group had greater problem solving skills. In the literature, it is stated that nurses' problem solving success increases with age (Gemlik & Sur 2003). In other studies, however, no correlation was seen between nurses' age and their problem solving skill (Erkus & Bahcecik 2015; Yildirim & Bagsurer 2019). In a study by Karakurt & Ekinci (2015), nurses who had a university degree, were single, and had been working in the profession for more than 16 years had higher problem solving skills. In a study by Yilmaz Kocak & Buyukyilmaz (2019), it was stated that as nurses' length of professional experience and mean age increased, their problem solving skills were seen to be at a higher level, but that there was no correlation between nurses' type of work or professional position and their problem solving skills. In the study, no statistical correlation was found between the variable of nurses' work position and their problem solving skills. However, the problem solving skills scores of nurses working in a position of responsibility were higher than those of nurses working in other positions, and these results were similar to results obtained in the literature (Erkus &Bahcecik2015). This can be explained by the constant need to make decisions experienced in the working environment by nurses who are managers or in positions of responsibility.

Conclusion and Recommendations: Critical thinking disposition of nurses were low level and their problem solving skills were moderate level. The relationship between the nurses' critical thinking disposition and their problem solving skills was a significantly moderate level and that as their critical thinking disposition increased, their problem solving skills increased also. In line with these results, a number of recommendations can be made. In order to train nurses with critical thinking skills, the curriculums of courses taken by nurses during their education should be re-organized, making use of problem solving and critical thinking methods. In-service programs should be arranged to develop the critical thinking and problem solving skills of nurses in the clinical environment, institutional policies should be developed to give an opportunity for critical thinking, and nurses should be supported by hospital managers.

Limitations: In our study, we aimed to contact nurses working in all fields in our hospital, in order to determine to what extent they were able to think critically about possible problems. However, most nurses were unwilling to take part in the study, with the result that an inadequate sample size was a limitation of the study.

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