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Nursing Students' Critical Thinking Levels

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Abstract

Introduction: Critical thinking is the key element of nursing practice, because critical thinking constitutes the base of developing accurate communication. As critical thinking is influencing patient care potentially, it is very important. With this study it was aimed to determine the critical thinking levels of nursing students. **Methods**: This study was planned to be conducted as analytical descriptive type in Corum/Turkey in the year 2014. Sample of the study (n=298) consisted of all students visiting the Health High School. The data in the study was collected by using Student Descriptive Characteristics Inventory Form and California Critical Thinking Dispositions Inventory (CCTDI). For the statistical analyze during the assessment of obtained findings from the study, the SPSS 15.0 program was used. Significance was evaluated in $p<0.05$ level. **Findings:** Nursing students' critical thinking point averages (208.7987±19.90634) were found low. Whereas students' CCTDI sub-scale point averages regarding analyticity and open-mindedness are medium, it was determined that searching for the truth, systematicity, self-confidence and curiosity sub-scale point averages are low. In the study was detected that family structure and maternal education level have an impact on students' critical thinking level and this difference was found statistically significant ($p<0.05$). According to

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CCTDI students' critical thinking level was determined to be low. **Conclusion*:*** It is recommended to use educational methods intending to increase students' critical level during nursing education, to encourage students to read books-magazines and newspapers, to perform intervention studies that evaluate the effects of different interventions in order to provide students with critical thinking skills.

Keywords: Nursing; education; California Critical Thinking Dispositions Inventory (CCTDI).

1. Introduction

Critical thinking is the key element of nursing practice, because critical thinking constitutes the base of developing accurate communication, problem solving ability, understand conceptual and theoretical features and nursing science (Moore, 2010; Andreou, Papastavrou, & Merkouris, 2014; Parker et al., 2014; Ulupınar, 2014; Kim, & Choi, 2014). Critical thinking gives nurses an opportunity to question events and make decisions about patients. It also provides that nurses make evaluations of their basic nursing education, professional experiences and research results and reflect these to their practice (Ucan, Tascı, & Ovayoglu, 2008; Parker et al., 2014; Hunter et al., 2014). Thus, decisions, which provide to proceed and develop independently shall be taken, the needs of the patient shall be identified, the most appropriate interventions to meet the needs of the patient shall be determined and a step towards problem solving shall be done (Moore, 2010; Paterson, & Chapman, 2013; Parker et al., 2014).

1.1 Problem Statement

Critical thinking is in our country as in the whole world an important topic regarding nursing education and the application fields (Goodman, 2011; Dirimese, & Dicle, 2012; Kim et al., 2014; Parker et al., 2014). After the critical thinking level of nursing students has developed, the quality of nursing care, which they practice in future will increase. In order to raise nurses, who can serve in this direction, it is important to provide students with critical thinking skills during their nursing education.

1.2 Research Question

What do the critical thinking levels of nursing students?

1.3 Purpose of The Study

Therefore in this study it was aimed to evaluate the critical thinking levels and the relation with some variables of students, visiting in the academic year 2013-2014 the Health High School, nursing department.

2. Research Methods

2.1 Type of Study and Sample

The study population consisted of nursing students, visiting Health High School in Corum city of Turkey (N=345), whereas the sample consisted of students, who were during data collection dates at school (n=298). Attainmet rate was 86.4%.

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This study was carried out as an analytical descriptive type. It was conducted between September and December 2014 at Health High School. The dependent variables of study are the point averages, which the students obtained from California Critical Thinking Dispositions Inventory (CCTDI), the independent variables are students' gender, socio-economic level, maternal/paternal education level, family structure, participation status in social-scientific activities and the number of books read per year. Before starting the study, a written working approval and Ankara Numune Education and Research Hospital ethical committee approval (18.08.2014/E-14-277) was obtained from the relevant authority (06.12.2013/232-70). Additionally the voluntarily participating students were informed about the purpose of the study and a written consent was taken. The questionnaires were filled out in approximately 15 minutes by using the face-to-face interview method.

2.2 Data collection

The studies' data was collected by using the "Student Descriptive Characteristics Inventory Form", which contains demographic information of students and the "California Critical Thinking Dispositions Inventory", consisting of 51 articles, of which validity reliability was made by (Kokdemir, 2003).

Student Descriptive Characteristics Inventory Form; has been prepared in accordance with the opinions of researchers and experts. In the form are questions included, that interrogate the variables influencing students' critical thinking levels like gender, socio-economic level, mother-father education level, mother-father attitude, participation status in social and scientific activities, books read per year.

California Critical Thinking Dispositions Inventory (CCTDI); has emerged as a result of the Delphi project, organized by the American Philosophical Association in 1990. The scale consists of 51 articles with a total of 5 point likert scale. The scale was determined theoretically and also tested psychometrically. Cronbach's alpha of all the scale was 0.88. It has 7 sub scales, consisting of searching for the truth, open-mindedness, analyticity, systematicity, self-confidence, curiosity and maturity, however in order to determine the critical thinking level the sum of this scale scoring system is used. The scale is based on the point given for each item. But the negative articles/items (5, 6, 9, 11, 15, 18, 19, 20, 21, 22, 23, 25, 27, 28, 33, 36, 41, 43, 45, 47, 49, 50) are scored in the adverse direction. In the scale assessment, the points given to each item by students according to their agreement status are added and the result is evaluated over 360. At the end of scoring, students who have scored lower than 240 points are accepted as having low critical thinking level, students who have scored between 240-300 points as having medium level and over 300 points a high critical thinking level. According to this, the values below 240 show that critical thinking skill is low, while the values over 240 show a sufficient critical thinking level (Kokdemir, 2003).

2.3 Statistical analysis

Data obtained from this study were analysed in the SPSS package program and for the significant test of the differences between number and percentage, t test was applied in paired groups and in groups of more than two the one-way variance analyses (ANOVA) test was applied. In case the F value, which is obtained as a result of the one-way variance analyses, is significant,

Tukey Test was applied in order to determine which group averages have a significant difference level. Significant level was evaluated as $p<0.05$ level.

3. Findings

In this study; 79.9% of students who participated in the study are girls and 72.3% (n=218) has three or more siblings. 64.4% (n=201) of students' mothers and 46.6% (n=139) students' fathers are primary graduates. The general structure of students' families participating in the study 70.5% (n=210) is accepting-reassuring and the socio-economic level of 79.5% (n=237) is medium. It was seen that 83.9% (n=250) of students do not participate in social activities and 89.9% (n=268) in scientific activities. Additionally it was determined that 50.3% (n=150) of students number of books read per year is between 1-5 and 16.5% (n=49) do not read any book.

Whereas the minimum point, which can be scored in CCTDI is 60 and the maximum point is 360, the CCTDI point averages of students in this study is 208.7987±19.90634, obtained minimum point is 160 and the maximum is 256. CCTDI's minimum point, which can be scored in each sub-scale is 10, the maximum is 60. The obtained CCTDI sub-scale point averages of students included in this study is given in Table 1.

Table 1. Descriptive Statistical Results of Students' CCTDI and Sub-scales Points

Sub-scales	*x*	*Sd*	*Median Value*	*Min.*	*Max.*
Searching for the truth	25.0101	4.60529	25.000	12	38
Open-mindedness	47.7215	7.69929	48.000	22	67
Analyticity	44.6074	6.21800	45.000	22	60
Systematicity	24.7215	4.16813	25.000	10	35
Self-confidence	27.9631	4.7782	28.000	16	42
Curiosity	38.7752	6.4384	38.000	23	54
CCTDI	208.7987	19.90634	208.500	160.00	256.00

Note: Arithmetic average (x), Standard deviation (Sd).

According to CCTDI, 90.6% of students included in the study are located in the low critical thinking level. In the CCTDI sub scale evaluation was seen that most of the students have a lowcritical thinking level in sub scales except of analyticity and open-mindedness. 56.7% students have a medium critical thinking level in the analyticity sub scale and 48% in open-mindedness (Table 2).

Table 2. Distribution of Critical Thinking Level According to Students' CCTDI and Sub-scales Points (N=298)

	Low		*Medium*		*High*	
Sub-scales	n	%	n	%	n	%
Searching for the truth	298	100	0	0.0	0	0.0
Open-mindedness	50	16.8	143	48	105	35.2
Analyticity	298	100	0	0.0	0	0.0
Systematicity	196	99.3	2	7	0	0.0
Self-confidence	183	61.4	103	34.6	12	4
Curiosity	78	26.2	169	56.7	51	17.1
CCTDI	271	90.6	27	9.1	0	0.0

Note: Values are given either as %

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Critical thinking level average of participating male students is 5.51 points lower than the average of female students. The difference of critical thinking point averages according to students' genders is statistically not significant ($p>0.05$). It was determined that the influence of maternal education level to critical thinking is statistically significant ($p<0.05$), while the paternal education level is not ($p>0.05$). After having analysed between which groups is a statistical difference, which emerges under the influence of maternal education level to critical thinking level, it was observed that the difference reason is due to the difference of point averages of students with primary graduate mothers and students with secondary and university graduate mothers (Table 3).

It was determined that the participating students' general family structure, socio-economic level's influence on critical thinking level is statistically significant ($p<0.05$). In further analyses was observed that the resulting statistical difference of the students' general family structure impact on critical thinking emerges because of the difference between students' point averages who have a "extremely tolerant" family structure and students with "accepting-reassuring democratic" and "inconsistent" family structure. In further analyses in order to determine the difference between groups regarding the impact of socio-economic level on critical thinking level, it was detected that this was a result of the point average difference between students with "low socio-economic level", "high socio-economic level" and "very high socio-economic level" (Table 3).

Table 3. Comparison of Students' Some Social-Demographic Characteristics Between CCTDI Point Average

Social-Demographic Characteristics	**n**	***CCTDI Point (x±Sd)***	***Statistical Analysis***
Gender			p value=
female	238	209.91±19.993	0.055
male	60	204.40±19.092	t=1.924
Mother' Educational Status			
none literacy	15	204.53±14.312	
literacy	29	204.28±15.506	p value=
elementary	201	208.98±20.090	0.002
high	39	217.69±21.192	F=4.273
university	14	195.36±17.127	
Father' Educational Status			
none literacy	7	200.43±18.017	
literacy	14	209.79±18.073	p value=
elementary	139	209.99±18.317	0.710
high	74	208.49±23.326	F=0.536
university	64	207.80±19.769	
Family Structure			
extremely tolerant	20	201.40±24.793	
protective	39	205.85±22.691	p value=
irrelevant	4	197.50±26.185	0.029
inconsistent	25	201.88±15.034	F=2.741
accepting reassuring democratic	210	211.09±18.908	
Socio-economic level			
low	28	213.89±26.329	

medium	237	209.73±18.718	p value=
high	19	198.58±20.156	0.005
very high	14	196.64±17.517	F=4.337
Participation status in social activities			p value=
Yes	48	208.50±18.376	0.182
No	250	208.86±20.221	t=0.113
Participation status in scientific activities			p value=
Yes	30	205.10±19.677	0.284
No	268	209.21±19.925	t=1.073

Notes. Values are given as arithmetic average (x) ± standard deviation (Sd)

Table 4. Comparison of Students' Number of Read Books Between CCTDI Point Average (N=298)

Sub-scales	**The total number of read books (year)**	***n***	***x±Sd***	***Min.***	***Max.***	***Statistical Analysis***
Searching for the truth	Not read any book	49	23.61±4.015	12	35	F=4.571
	1-5 books	150	24.84±4.933	12	36	p value=
	6-20 books	99	25.96±4.177	12	38	0.011
Open-mindedness	Not read any book	49	44.99±8.133	22	62	F=4.521
	1-5 books	150	47.84±7.764	29	67	p value=
	6-20 books	99	48.92±7.089	34	67	0.012
Analyticity	Not read any book	49	43.39±7.173	22	60	F=1.191
	1-5 books	150	44.96±6.013	31	56	p value=
	6-20 books	99	44.68±6.005	30	60	0.305
Systematicity	Not read any book	49	23.96±4.148	10	30	F=1.440
	1-5 books	150	24.67±4.118	15	35	p value=
	6-20 books	99	25.18±4.234	17	34	0.238
Self-confidence	Not read any book	49	26.78±5.444	18	42	F=2.072
	1-5 books	150	28.35±4.456	17	40	p value=
	6-20 books	99	27.97±4.637	16	37	0.128
Curiosity	Not read any book	49	36.20±6.837	25	54	F=5.895
	1-5 books	150	38.81±5.790	23	53	p value=
	6-20 books	99	40.00±6.841	25	53	0.003
CCTDI	Not read any book	49	198.88±20.620	160	240	F=8,484
	1-5 books	150	209.46±18.671	168	253	p value=
	6-20 books	99	212.71±19.933	164	256	0.000

Notes. Values are given as arithmetic average (x) ± standard deviation (Sd)

Furthermore it was observed that the students' participation status in social and scientific activities do not influence the CCTDI point averages ($p>0.05$; Table 3), whereas the total number

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of read books do ($p<0.05$; Table 4). After having analysed the relation between the reading status and the sub scale of the students; it was seen that students who read 6-20 books per year have a high CCTDI sub scale point average compared to the ones who do not read any book. The sub scale point averages of searching for the truth, open-mindedness and curiosity were found statistically significant ($p<0.05$; Table 4).

4. Conclusions

Critical thinking skill is a skill that has to be imparted to the nurses during their education because nurses faces many situations, where they have to use their critical thinking skills to take critical decisions while practicing their profession (Andreou, Papastavrou, & Merkouris, 2014; Hunter et al., 2014; Kim et al., 2014). In studies (Ozturk, & Ulusoy, 2008; Bulut, Ertem, & Sevil, 2009; Saglam, & Buyukuysal, 2013; Hunter et al., 2014; Kim et al., 2014; Paul, 2014) and in our study was determined that nursing students' critical thinking level is low (Table 1). Analysing the studies with nursing students it was observed that critical thinking level points are not at the desired level in a manner similar to our study. As reasons why nursing students' critical thinking levels are not at the desired level can be considered the differences in the education system, the perception of nursing as a profession to be specific to women and due to the social concept of gender.

Nurses have to search for the truth in order to evaluate disparate ideas and take patient-related decisions, furthermore they have to be open-minded in order to take patient-related decisions paying attention to the thoughts of his/her team and last but not least they have to be analytical, careful and systematic for a planned research in order to reason problems. Additionally they have to be curious in order to provide his/her personal development and must believe in him-/herself and his/her thoughts (Sullivan, 2012; Chan, 2013; Morrall, & Goodman, 2013). According to CCTDI students in our study have only received medium level point in the analyticity and open-mindedness subscales. However, when we look at the sub scale scores of the students these features appear to be insufficient (Table 2).

It is reported that students' critical thinking skills are influenced together with the innate characteristics by family structure, maternal-paternal education level, socio-economic level, environment, teacher attitude in school, physical condition, nutrition, sleep, rest period, age, development level, gender, religious beliefs, environmental factors etc. (Ozturk, & Ulusoy, 2008; Moor, 2010; Dirimese, & Dicle, 2012; Saglam, & Buyukuysal, 2013). In literature there are together with studies that do not indicate any relationship (Ozturk, & Ulusoy, 2008; Hunter et al., 2014) between critical thinking and gender also studies (Saglam, & Buyukuysal, 2013; Kim et al., 2014), which indicate a relationship. Although the difference of critical thinking point average between female and male students in our study is 6, no statistical significant difference was found between gender and CCTDI point average ($p>0.05$; Table 3). In our study was observed that the CCTDI point average difference regarding paternal education level is not statistically significant ($p>0.05$), whereas the difference concerning maternal education level was found statistically significant ($p<0.05$; Table 3). In further analyses it was concluded that students' critical thinking levels of primary graduate mothers are significantly lower than students of high school graduates.

Attitude of mother-father may be the cause of the healthy or unhealthy development of a person. According to the values and beliefs of parents, there are accepting-reassuring and democratic,

extremely authoritarian and rejecting, extremely tolerant, overprotective, aloof, indifferent and inconsistent family attitudes (Ozturk, & Ulusoy, 2008; Ulukaya, & Bilge, 2014). Social and conformist individuals grow in a democratic, accepting-reassuring adopted family structure. These grow up as active, independent decision-taking, creative, curious, not blindly tied to authority, social and conformist individuals. In contrast, in an overprotective, tolerant, indifferent, inconsistent and rejecting adopted family structure, aggressive, intolerant, vicious, tied to authority without questioning, shy and individuals with low self-confidence grow up (Ulukaya, & Bilge, 2014; Hallac, & Oz, 2014). The most family structures of students who participated in our study are accepting-reassuring and democratic. The CCTDI point average height of these students are similar with literature. (Ozturk, & Ulusoy, 2008; Kim, & Choi, 2014).

In this submitted study the CCTDI point averages of participating students, who defined their socio-economic level low, was found high and students with very high socio-economic level was found low, therefore this difference was seen statistically significant ($p<0.05$; Table 3). This finding is similar with literature (Zaybak, & Khorshid, 2006; Bulut, Ertem, & Sevil, 2009). The fact that the CCTDI point averages of nursing students, who identify their socio-economic level as low, is high, can be considered as low socio-economic level makes social life more difficult and therefore develops awareness. It can be concluded that as a result of this critical thinking skill increases.

Participating in social and scientific activities can be effective to develop the students' critical thinking. The activities improve students' critical thinking, be sociable, view and interpret events from different perspectives and develops decision making periods after having done analysis. Furthermore the activities make positive contribution to mental development together with physical development and human relations (Dirimese, & Dicle, 2012; Morrall, & Goodman, 2013; Parker et al., 2014). In our study was observed in accordance with literature (Zaybak, & Khorshid, 2006) that there are lots of students not participating in social and scientific activities. Additionally it was seen that students' critical thinking point averages, who participate in social and scientific activities are in comparison to not participating students lower; this difference was not found statistically significant ($p>0.05$; Table 3).

Book reading provides that critical thinking is activated, multiple thinking is learned and imagination is developed. Furthermore it is reported that reading books help that individuals with different perspectives, researching the cause and effect relation, asking right questions by evaluating the ideas, productive, self-confident, able to think freely and critically, broad-minded grow up (Paterson, & Chapman, 2013; Karadeniz, 2014). In literature (Zaybak, & Khorshid, 2006) was reported that there is a significant relation between critical thinking and reading books and emphasized that students with high critical thinking level have a high book reading level. In our study was determined that 50.3% read 1-5 books per year and a statistically significant was found between the number of books read per year and their CCTDI point averages ($p<0,05$; Table 4). Additionally it was determined that the CCTDI sub scale point averages of students, who read annually 6-20 books are higher than the ones who do not read any book and that the sub-scale point averages of searching the truth, open-mindedness and curiosity is statistically significant ($p<0.05$). This finding is an expected finding for critical thinking, reading, questioning, analysing and researching individuals.

This study is limited with the findings obtained from 298 students, who are visiting the Health School and were available during the time of the study students and therefore included in the study.

It is thought to conduct more comprehensive studies in future that may reflect the critical thinking skills and increased critical thinking skill level of all students throughout the country.

In accordance with the obtained findings from the study; it is recommended that students' critical thinking skill level increasing methods and techniques are used in nursing education, critical thinking skill developing program is added to the syllabus, critical thinking skill acquiring teaching environment is ensured, reading books, magazines and newspapers is encouraged, participating scientific and social activities is supported and intervention studies in order to assess the effects of different attempts to provide students with critical thinking skills are done.

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