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The Relationship between Ageism, Willingness to Care for Older Adults and Care Behaviors of Nursing Students: A Cross-Sectional Study

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ABSTRACT:
Purpose: This study was conducted to determine nursing student attitudes towards ageism, their willingness to care for older adults, their level of care quality perception, and to examine the relationships between them.
Material and Methods: This was a descriptive cross-sectional study. The study was conducted at four different universities in Turkiye. The population for the research consisted of fourth-year students studying in the nursing departments of four different universities in 2020 – 2021 academic year. Data were collected using the Student Information Form, Ageism Attitude Scale, Elderly Patient Care Inventory, and Caring Behaviors Inventory-24. In the data analysis, independent samples t-test, ANOVA and Spearman Correlation were used.
Results: Students had positive attitudes towards ageism. There were positive relationships between ageism with perception of care quality and willingness to care for older adults. It was determined that there was a positive and statistically advanced relationship between the willingness to care for the elderly and the attitude of ageism ($r=0.48$; $p<0.001$). It was determined that there was a positive and significant relationship ($r=0.49$; $p<0.001$) between age discrimination and the level of perception of quality of care. There was no statistically significant relationship between students' willingness to care for the elderly and their caring behaviors ($r=0.18$; $p>0.05$), but there was a significant relationship between the sub-dimension of commitment ($r=0.24$; $p<0.05$).
Conclusion: The increases in students' positive attitudes towards ageism, their perception of the quality of care and willingness to care for the elderly are positive in parallel.
Keywords: *Ageism, attitude, behavior, nursing student, older adult*

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INTRODUCTION

The elderly population is increasing rapidly due to the prolongation of life expectancy and decrease in fertility rates. While the elderly population was approximately 727 million worldwide in 2020, it is predicted that this number will reach 1.5 billion in 2050 (United Nations Department of Economic and Social Affairs, 2020). It is not clearly known to what extent these predictions will be affected due to the COVID-19 pandemic ongoing since 2019. The need for long-term care of the elderly arises due to reasons such as the increase in chronic diseases in old age, weakening of physical health, becoming semi- or fully dependent for daily living activities, and increases the demand for health institutions (Ayaz Alkaya and Birimoglu Okuyan, 2017; Lan et al., 2019). Nurses, who play an important role in the health care team, are the health personnel who communicate with the patient most frequently and they have responsibilities such as education, care, counseling, organizing studies, being a representative of change, and being a resource for

the individual with chronic disease. Knowledge, skills and beliefs of nursing students, as well as their attitudes towards aging and elderly individuals, affect the quality of health services provided to the elderly (Kaplan Serin and Tuluce, 2021). For this reason, the need for nurses who are willing to care for the elderly is critical (Lan et al., 2019).

The old age period is a natural part of the life process, so it is a period that every person will experience. Despite this, attitudes and behaviors towards the elderly may change due to the physiological, psychological, social and economic changes that occur in old age, in other words, age discrimination occurs (Vefikulucay Yilmaz and Terzioglu 2011). Having a negative attitude towards the elderly causes the elderly to adopt negative attitudes about themselves, reduces their self-confidence and causes them to assume a passive role in treatment. Thus, it affects the caregiver's willingness to provide care and the quality of care provided to the patient is negatively affected (Rachel and Cozort 2008).

Care and behavior in nursing are two intertwined concepts (Altiok et al., 2011). Care behaviors and attitudes in nursing affect the quality of the health service provided. One of the most important indicators of health service quality is patient satisfaction. Patients' perceptions of care behavior and their expectations from care are factors that affect patient satisfaction (Gul and Dinc, 2018). The perceptions of care behaviors of patients and nurses and their expectations from care may differ. In a study, it was reported that while giving effective care is important according to nurses, positive attitudes and knowledge of nurses are important according to patients (Von Essen and Sjoden, 2003). As a result of another study; It is reported that the availability of nurses is an important care behavior for patients and nurses (Zamanzadeh et al., 2010). The nurse's attitude and behavior towards the patient are among the most important factors affecting patient satisfaction (Buber and Baser, 2012; Kabaroglu et al., 2013).

Ageism is a multidimensional concept that includes different attitudes, prejudices, behaviors and actions shown to an elderly person only because of their age, for or against them (Bulut and Cilingir, 2016). At this point, the importance of positive attitudes towards ageism and the willingness to care for the elderly is notable. There are studies about ageism in the literature (Bozdogan Yesilot et al., 2020; Karadag et al., 2012; Ozdemir and Bilgili, 2016; Suluker and Turkoglu, 2021; Yardimci Gurel, 2019). Care behaviors and attitudes in nursing affect the quality of the health service provided (Gul and Dinc, 2018). It is of great importance to evaluate the attitudes towards ageism, willingness to care for the elderly, and to examine the effects on care behaviors among nursing students who are the nurses of the future. In this respect, it is thought that there is a need to evaluate care behaviors for the elderly of nursing students. The attitude towards the elderly may also affect the nurses' willingness to deal with the elderly. Although nursing students' attitudes towards ageism are positive, there are differences between their caregiving status and this attitude (Karadag et al., 2012). Although nursing students' attitudes towards the elderly are positive, it is recommended to examine how effective these attitudes can be in elderly care (McKinlay and Cowan 2003; Jang et al., 2019). In the literature, there are studies on nursing students' attitudes towards ageism and their willingness to care for the elderly (Hancerlioglu and Karadakovan, 2016; Vefikuluçay Yılmaz and Terzioğlu, 2011). However, no study has been found that examines the effects of nursing students' attitude towards ageism, their willingness to care for the elderly, and their care behaviors. For this reason, it is thought that investigating the reflection of attitude towards ageism and willingness to care for the patient within care behavior will be useful in terms of evaluating the quality of care.

MATERIAL and METHODS

Purpose and Type of the Study

The purpose of this study was to determine the attitudes of fourth-year nursing students towards ageism, their willingness to care for the elderly, their level of perception of quality of care and to examine the relationship between them. This study was designed as a descriptive cross-sectional study. The research questions for the study were “Is there a relationship between the willingness of fourth year nursing students to care for the elderly and their

attitudes towards ageism?", "Is there a relationship between willingness to care for the elderly, attitudes towards ageism, and levels of perception of quality of care with socio-demographic status of nursing fourth year students?", "Is there a relationship between fourth year nursing students' willingness to care for the elderly and their levels of perception of care quality?" and "Is there a relationship between the level of perception of quality of care and quality of care with age discrimination attitudes of fourth year nursing students?"

Sampling and Participant

The population for the research consisted of 550 fourth-year students studying in the nursing departments of four different universities in the 2020-2021 academic year, in the province of Istanbul. The sample size was calculated using the appropriate sampling method (5% margin of error, 80% power of the study). It was used the formula for the sample size for a mean estimate [$N=(SD/SE)^2$]. The sample comprised 15.8% of the population and the study was completed with 87 students. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guide was followed in the writing of the article.

Data Collection Tools

Data were collected using the Student Information Form, Ageism Attitude Scale (AAS), Elderly Patient Care Inventory (EPCI), and Caring Behaviors Inventory-24 (CBI-24).

Student Information Form: This form included questions about gender, place of birth, high school, number of siblings, living/not living with elderly people, and the desire to live with parents.

Ageism Attitude Scale (AAS): Attitudes towards ageism were evaluated using the Ageism Attitude Scale (AAS) (Vefikulucay Yilmaz and Terzioglu, 2011). The AAS consists of 23 items, 9 positive and 14 negative. Responses are graded on a five-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). Positive items are scored from 5, 4, 3, 2 and 1, respectively; negative items are scored from 1, 2, 3, 4 and 5, respectively. The scale has three subdimensions of restricted elderly life (REL; 1st, 5th, 12th, 14th, 17th, 19th, 21st, 22nd, 23rd items), positive ageism (PA; 2nd, 4th, 6th, 7th, 8th, 9th, 13th, 20th items) and negative ageism (NA: 3rd, 10th, 11th, 15th, 16th, 18th items). The lowest and highest scores that can be obtained from the scale are 9-45 for REL; 8-40 for PA; and 6-30 for NA; while the total scores for the scale are 23-115. A high score indicates positive aspects of ageism, and low score indicates negative aspects. The Cronbach-α coefficient of the scale was 0.80 (Vefikulucay Yilmaz and Terzioglu, 2011). In this study, the Cronbach-α coefficient was determined as 0.76.

Elderly Patient Care Inventory (EPCI): Willingness to care for the elderly of nursing students was evaluated using the Elderly Patient Care Inventory (EPCI). The Cronbach-α coefficient of the scale was 0.70 (Aday and Campbell, 1995). The EPCI was translated into Turkish and confirmed to have structural validity and internal consistency (Hancerlioglu and Karadakovan, 2016). The scale consists of 12 items. Responses are graded on a five-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). The lowest score obtained from the scale is 12, and the highest score is 60. As the score obtained from the scale increases, the level of willingness to give care also increases. The Cronbach-α coefficient of the scale was 0.682 (Hancerlioglu and Karadakovan, 2016). In this study, the EPCI Cronbach-α coefficient was found to be 0.67. When correlations were examined between the items on the scale, it was determined that the 1st, 10th and 12th items had negative correlation compared to the other items on the scale. For this reason, calculations related to scale were repeated in this study. The overall score of the scale was calculated by reversing the scores for the 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th and 11th items, and statistical evaluations were made using this version of the scale. As a result of this evaluation, the Cronbach-α coefficient of the scale was determined as 0.74. In this context, it was shown that the scale is a usable scale. The obtained results were consistent in the expected direction.

Caring Behaviors Inventory-24 (CBI-24): The CBI-42

was developed to evaluate the nursing care process (Wolf et al., 1994). The CBI-42 was initially developed and then the short form CBI-24 was created (Wu et al., 2006). The CBI-24 was translated into Turkish and was confirmed to have structural validity and internal consistency. The Cronbach-α coefficient of the scale was 0.96 among nurses (Kursun and Kanan, 2012). The scale consists of 24 items. Responses are graded on a six-point Likert-type scale ranging from 1 (never) to 6 (always). The scale has four sub-dimensions of assurance (16th, 17th, 18th, 20th, 21st, 22nd, 23rd, 24th items), knowledge and skill (9th, 10th, 11th, 12th, 15th items), respect (1st, 3rd, 5th, 6th, 13th, 19th items) and connectedness (2nd, 4th, 7th, 8th, 14th items). The mean scores for the scale and for each sub-dimension are calculated. The lowest and highest scores that can be obtained from the scale and its sub-dimensions are 1-6. As the score obtained from the total and sub-dimensions of the scale increases, the level of perception of quality of care also increases. In this study, the Cronbach-α coefficient was determined as 0.97.

Data Collection

Students were reached through a phone application that nursing students use to communicate within the school. From here, students were first presented with an explanation text that gave information about the purpose and content of the research. Research forms were prepared electronically with the Google Form program. Then, the online link address for the Student Information Form, AAS, EPCI and CBI-24 was sent to the students. Students were asked to answer the questions on these forms completely. The answers from the students reached the researcher automatically through the system and were recorded by entering data into the computer.

Statistical Analysis

The SPSS (Statistical Package Social Sciences of Windows) version 22.0 software was used for statistical analysis. Data are presented as mean, standard deviation, median, minimum, maximum, percentage and number. Normal distribution of continuous variables was evaluated with the Shapiro Wilk-W test and the Kolmogorov Smirnov test. In the comparisons between two independent groups, the Independent Samples T test was used when the normal distribution condition was met, and the Mann Whitney U test was used if it was not. In the comparison of continuous variables in more than two independent groups, the ANOVA test was used when the normal distribution condition was met, and the Kruskal Wallis test was used when it was not. In determining the relationship between two quantitative variables, if the normal distribution condition was met, and Pearson correlation was not valid, then the Spearman correlation test was used. The internal consistency between the items on the scales was presented as Cronbach-α value. Statistical significance value was accepted as $p<0.05$. Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guide was followed in the writing of the article.

Ethical Approval

Ethical approval was obtained from the scientific research ethics committee of the university (Number: 2019/195; Date: January 07, 2020) for the study. Institutional approval was obtained from the departments of nursing at the universities. Verbal and written consent was obtained from the nursing students.

RESULTS

Demographic Characteristics

A total of 87 students participated in the study. Of students, 82.8% were female, 78.2% were born in the city, 52.9% had three or more siblings, and 5.2% graduated from health vocational high school. Of participants, 50.6% had lived in the same house as elderly people before. It was determined that 63.6% of those living in the same house with elderly people lived together for three years or more. Of students, 68.9% did not want to live with their parents after starting a family. The reasons for not wanting to live with parents were the desire to be free for 76.7% and disruption to the order *in the house for 23.*3% (Table 1).

Findings about student attitudes towards ageism, willingness to care for the elderly, and care behaviors

The student AAS total score average was 87.30±8.30;

with values of 38.40±3.70 for the REL sub-dimension, 30.20±4.50 for the PA subscale, and 18.60±3.30 for the NA subscale. These findings revealed that student attitudes towards ageism were positive. The mean EPCI score of the students was found to be 39.56±5.88. The EPCI point average showed that the students had high level of willingness to care for the elderly. The average of the student CBI-24 total score was 5.10±0.0; with values of 5.20±0.70 for the assurance sub-dimension, 5.10±0.80 for knowledge and skill sub-dimension, 5.10±0.70 for the respect sub-dimension, and 5.10±0.70 for the connectedness sub-dimension. The scores obtained from the total and sub-dimensions of the scale revealed that the students had high level of care quality perception.

Table 1. Individual characteristics of students (n=87)

Individual characteristics		n	%
Gender	Female	72	82.8
	Male	15	17.2
Place of birth	Countryside	19	21.8
	City	68	78.2
Number of siblings	One	22	25.3
	Two	19	21.8
	Three or more	46	52.9
Graduated high school	Public high school	63	72.4
	Health vocational high school	5	5.7
	Other high schools	19	21.8
Lived in the same house as elderly people before	Yes	44	50.6
	No	43	49.4
If yes, how many years? (n=44)	One year	12	27.3
	Two year	4	9.1
	Three years or more	28	63.6
Willingness to live with parents after getting married	Yes	27	31.1
	No	60	68.9
Reason for unwillingness to live with parents (n=60)	Desire to stay free	46	76.7
	Deterioration of lifestyle at home	14	23.3

Correlation between student individual characteristics and attitudes towards ageism, willingness to care for the elderly, and care behaviors

The values related to the mean scores of AAS, EPCI and CBI-24 according to the individual characteristics of the students are shown in Table 2. No statistically significant difference was found between most of the individual characteristics and the mean scores for the AAS, EPCI and CBI-24 ($p>0.001$). When the students' willingness to live with their parents after starting a family was examined, the AAS ($p<0.05$) and PA sub-dimension ($p<0.001$) score averages of the students who answered yes were higher than the students who answered no, and this difference was statistically significant. When the reasons were compared for those who did not want to live with their parents after starting a family, those who stated the desire to be free had higher AAS score averages than those who stated that they wanted to be free, and this difference was statistically significant ($p<0.05$). The EPCI score average of the students with one or more siblings was higher than the students with two siblings, and this difference was statistically significant ($p<0.05$). When the situation of wanting to live with a parent after starting a family was examined, the students who answered yes had higher CBI-24, assurance sub-dimension, respect sub-dimension, and connectedness sub-dimension score averages

compared to other students, and this difference was statistically significant (p<0.05). There was no statistically significant difference in the mean scores for the knowledge and skill sub-dimension (p>0.05). When the reasons were compared for those who did not want to live with their parents after starting a family, there was no statistically significant difference between the mean scores of the CBI-24, assurance sub-dimension, knowledge and skill sub-dimension, and respectful sub-dimension (p>0.05). The connectedness sub-dimension mean score was found to be lower for students who stated their reason was the desire to be free, and this difference was statistically significant (p<0.05).

Correlation between attitudes towards ageism, willingness to care for the elderly, and care behaviors

When the average scores of the students regarding the EPCI and AAS and the dimensions of the scale are examined, there were positive and statistically advanced relationships between EPCI with AAS, REL and NA sub-dimensions (p<0.001). There was a positive and statistically significant relationship between EPCI and PA sub-dimensions (p<0.05) (Table 3).

Table 2. AAS, EPCI and CBI-24 average scores of students according to their individual characteristics (n=87)

Individual characteristics		AAS Mean ± SD	EPCI Mean ± SD	CBI-24 Mean ± SD
Gender	Female	87.00±8.30	39.27±5.80	5.19±0.68
	Male	89.26±8.37	40.93±6.23	5.09±0.84
		t=0.960; p=0.34	t=-0.99; p=0.32	Z_{MWU}=-0.2; p=0.82
Place of birth	Countryside	87.21±8.83	39.21±6.60	5.03±0.85
	City	87.44±8.23	39.66±5.89	5.21±0.66
		t=-0.11; p=0.92	t=-0.29; p=0.77	Z_{MWU}=-0.5; p=0.60
Number of siblings	One	86.18±8.23	41.13±4.51	5.16±0.76
	Two	86.00±9.77	36.26±5.84	5.10±0.61
	Three or more	88.54±7.70	40.17±6.66	5.20±0.73
		F=0.9; p=0.39	F=4.33; **p=0.01**	χ^2=0.9; p=0.63
Graduated high school	Public high school	87.69±8.45	40.03±5.61	5.19±0.74
	Health vocational high school	88.00±7.48	39.80±5.01	5.43±0.56
	Other high schools	86.21±8.37	37.94±6.89	5.04±0.64
		F=0.25; p=0.78	F=0.91; p=0.40	χ^2=1.8; p=0.39
Lived in the same house with elderly people before	Yes	87.11±8.85	39.63±6.67	5.27±0.63
	No	87.67±7.82	39.48±5.03	5.06±0.77
		t=-0.31; p=0.75	t=0.11; p=0.90	Z_{MWU}=-1.02; p=0.30
Willingness to live with parents after getting married	Yes	90.82±7.44	41.89±6.43	5.44±0.66
	No	85.76±8.26	38.45±5.31	5.04±0.70
		t=2.75; **p=0.007**	t=2.45; p=0.10	Z_{MWU}=-2.7; **p=0.005**
Reason for unwillingness to live with parents (n=60)	Desire to stay free	87.08±8.33	38.97±5.10	5.12±0.69
	Deterioration of lifestyle at home	81.78±6.58	36.92±5.70	4.83±0.70
		t=2.18; **p=0.03**	t=1.27; p=0.24	Z_{MWU}=-16; p=0.10

SD: standard deviation, t: Independent samples t-test, F: ANOVA, Z_{MWU}: Mann Whitney U Test, χ^2: Kruskal Walls H-Test

Table 3. Correlation between student attitudes towards ageism and their willingness to care for the elderly

	EPCI	
	r	P
AAS	0.48	**<0.001**
REL	0.31	**<0.001**
PA	0.33	**0.002**
NA	0.35	**<0.001**

AAS: Ageism Attitude Scale, REL: Restricted Elderly Life subscale, PA: Positive Ageism subscale, NA: Negative Ageism subscale, EPCI: Elderly Patient Care Inventory. Data were analyzed with the Spearman's Rho test.

Table 4. Correlation between student care behaviors with their attitudes towards ageism and willingness to care for the elderly

	EPCI		AAS		REL		PA		NA	
	r_s	p	r_s	p	r_s	p	r_s	p	r_s	p
CBI-24	0.18	0.11	0.49	**<0.001**	0.48	**<0.001**	0.37	**<0.001**	0.18	0.08
Assurance subscale	0.16	0.14	0.41	**<0.001**	0.42	**<0.001**	0.27	**0.010**	0.19	0.06
Knowledge and Skill subscale	0.08	0.48	0.44	**<0.001**	0.41	**<0.001**	0.33	**0.002**	0.18	0.09
Respectful subscale	0.19	0.09	0.49	**<0.001**	0.49	**<0.001**	0.38	**<0.001**	0.15	0.14
Connectedness subscale	0.24	**0.03**	0.52	**<0.001**	0.48	**<0.001**	0.45	**<0.001**	0.15	0.15

AAS: Ageism Attitude Scale, REL: Restricted Elderly Life subscale, PA: Positive Ageism subscale, NA: Negative Ageism subscale, EPCI: Elderly Patient Care Inventory, CBI-24: Caring Behaviors Inventory-24, r_s: Spearman's Rho test

When the student EPCI and CBI-24 average scores are examined, there was a positive and statistically significant relationship between EPCI and the connectedness sub-dimension average scores of the CBI-24 only ($p<0.05$). When the relationship between student AAS and CBI-24 average scores is examined, positive and statistically significant relationships were found between CBI-24 with REL and PA sub-dimensions of AAS ($p<0.05$) (Table 4).

DISCUSSION

With the aging world population, the need for health personnel to care for the elderly is increasing. In order to meet this increasing need all around the world, the integration of various robot models into nursing care for the elderly has been considered (Baloglu et al., 2019). However, humans are a whole with physiological, social, spiritual and psychological dimensions, and the lack of one of these dimensions affects the other dimensions. Nursing care therefore requires a holistic approach (Bayindir and Bicer, 2019). Nurse attitudes towards the elderly, their willingness to care for the elderly and their care behaviors are important for the quality of care for elderly patients (Baysal et al., 2019). In the literature, there are some studies showing the attitudes of nursing students towards ageism, factors affecting these attitudes, and willingness to work with elderly patients (Ayaz Alkaya and Birimoglu Okuyan, 2017; Carlson and Idvall, 2015; Chi et al., 2016; Darling et al., 2018). However, there is no study examining the relationship between the attitudes and willingness of nursing students with their care behaviors. Although the attitudes of nursing students towards the elderly are positive, it is recommended to examine how effective these attitudes are in the care of the elderly (Jang et al., 2019). For this reason, in this study, along with the attitudes of fourth-year nursing students towards ageism, their willingness to care for the elderly and their caring behaviors were also evaluated.

In studies examining nursing student attitudes towards ageism in the literature, the mean scores of AAS dimensions are in parallel with the findings of

this study. It is noteworthy that the mean AAS score of nursing students was between 68.6 and 87.2 in the literature (Altay and Aydin, 2015; Bozdogan Yesilot et al., 2020; Bulut and Cilingir, 2016; Kaplan Serin and Tuluce, 2021; Salin et al., 2020; Yardimci Gurel, 2019). In this study, student attitudes towards ageism were found to be higher than the literature. All students in the nursing department were evaluated in most of the studies. The class differences of students can change the attitude towards ageism (Olak and Tumer, 2018). It is thought that the high AAS score average in this study may be related to the increase in the education of the students who were in fourth year and, in this context, the increase in their theoretical knowledge and experience with patients.

In this study, no significant relationship was found between the mean scores of AAS and dimensions and the individual characteristics of the students. However, a significant correlation was found between AAS and PA sub-dimension mean scores between students who wanted to live with their parents after starting a family and those who did not. Most of the students stated that they did not want to live with their parents after starting a family, and they mostly cited their desire to be free as the reason for not wanting this. In our society, the family structure has transformed from an extended family structure to a nuclear family structure over time. In the study, the students' unwillingness to live with their parents after starting a family may be due to changes in the family structure of society. It was reported that more than half of nursing department students wanted to live with their parents after marriage, and those who did not want to live with their parents wanted to live alone (Bulut and Cilingir, 2016). It was shown that after graduation, students mostly do not want to live with family members (Yardimci Gurel, 2019). The fact that only fourth-year students were examined in this study may have affected the results.

The students' willingness to care for the elderly was at a high level with an average of 39.56±5.88 points. In another study, in which the same scale was used in the literature, the mean score for willingness of nursing students to care for the elderly was reported as 40.19±4.69 (Galzignato et al., 2021). The result of the study is consistent with the study using the same scale in the literature. In the literature, there are also studies that evaluated the willingness of nursing students to care for the elderly by using different data collection tools and revealed different results (Chi et al., 2016; Jang et al., 2019; Liu et al., 2022; Zhang et al., 2016).

A significant relationship was found between the individual characteristics of the students only for the number of siblings and their willingness to care for the elderly. The number of siblings is not questioned in the literature. However, it is reported that other characteristics do not significantly affect the willingness to care for elderly patients (Carlson and Idvall, 2015; Chi et al., 2016). The results of this study are compatible with the literature. In the literature it is seen that nursing students who spent time with the elderly, grew up with their grandparents, have more communication with the elderly, and want to live in the same house with the elderly have a higher level of willingness to care for. In addition, it is emphasized that students who are experienced in elder care have a higher level of willingness to care for the elderly (Chi et al., 2016; Dai et al., 2021; Galzignato et al., 2021; Jang et al., 2019; Zhang et al., 2016). In this study, no relationship was found between the fourth year nursing students living in the same house as elderly people and their willingness to care for the elderly. This difference between the results of the study and the literature may be due to the possibility that the students who spent time with the elderly are also experienced in elderly care. The students' level of care quality perception was found to be high. There was no study in the literature examining the relationship between nursing students' level of care quality perception and elderly care. In the study, no relationship was found between the individual characteristics of the students and the level of perception of quality of care. However, the scores for the CBI-24, assurance, respectful and connectedness sub-dimensions for students who wanted to live with their parents after starting a family were found to be higher than the scores for students who did not want to live with their parents after starting a family. The high level of perception of quality of care of students who wanted to live with their parents suggests that they can

provide quality care to the elderly. As a result of the study, the level of care quality perception of the students with a positive attitude towards ageism was also found to be high. The connectedness sub-dimension mean score on the CBI-24 for students who did not want to live with their parents after starting a family was expected to be lower than the average score of the students who did not want to live with their parents due to the disorder in the house. The average score for the connectedness sub-dimension of students who preferred not to live with parents due to wanting freedom was is higher than the other group. The respect for the elderly in our society, the acceptance of the elderly as the elders in the family and the importance given to the elderly may have affected this result.

In the literature, study could not be found evaluated the relationship between attitudes about ageism and willingness to care for the elderly. However, it was reported that students with a positive attitude towards the elderly are more willing to work with elderly patients and have higher willingness to care for the elderly (Chi et al., 2016; Galzignato et al., 2021; Jang et al., 2019; Zhang et al., 2016). The result of this study is compatible with the literature. The high level of care quality perception of students with positive ageism is important in terms of providing quality care to the increasing elderly population. There is no study in the literature examining the relationship between the attitudes about ageism and the perception of quality of care. However, it was predicted that the attitude of ageism is important in order for nursing students, who are the nurses of the future, to provide quality care to the increasing elderly population (Baysal et al., 2019; Jang et al., 2019; Rathnayake et al., 2016; Uysal et al., 2020). A significant relationship was found between the students' willingness to care for the elderly and the connectedness sub-dimension of CBI-24. There is no study in the literature examining the relationship between willingness to care for the elderly and caring behaviors. However, it was reported that nursing students who voluntarily serve the elderly have a higher level of willingness to care for the elderly (Chi et al., 2016). The connectedness sub-dimension of the CBI-24 includes items that reflect the individual's behaviors such as "sparing time for the patient", "being patient and understanding with the patient" and "helping the patient's development". The care behaviors of individuals with high willingness to care for the elderly may also be affected in the clinical setting. However, it is thought that the connectedness sub-dimension in caring behaviors may reflect the volunteering of students for elder care. In this respect, the results of the study support the literature.

CONCLUSION

As a result of this study, it was determined that the students' attitudes towards the elderly were positive, and their willingness to care for the elderly and their level of perception of quality of care were high. The increase in students' positive attitudes towards ageism, their perception of the quality of care and their willingness to care for the elderly may be in parallel.

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Conflict of Interest

No conflict of interest has been declared by the authors.

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Research Article

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Analysis of the YouTube™ Videos about Children with Cerebral Palsy: A Research Article**

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ABSTRACT:
Purpose: Cerebral palsy (CP) is a long-term disability and parents need to be informed throughout their lives. The videos shown on YouTube™, may be inadequate or contain erroneous information since they are not subjected to a process of evaluation and are not regularly updated. The aim of this study was to investigate the scientific content and quality of YouTube™ videos related to CP.
Material and Methods: The YouTube™ online library was searched using the term "Children with Cerebral Palsy". The quality and content of the videos was explored with the GQS (Global Quality Scale) and scientific content with the CPss (Cerebral Palsy Scoring System). The characteristics of the videos (video length, source, date of upload, likes etc.) were recorded.
Results: The study was completed with 29 videos. 43.44% of the videos included in the study contained diagnostic information, 23.3% contained information about treatment, and 21.18% contained information about comorbidities. The mean GQS score was 1.96 ±1.34, the CPss score was 5.75±4.08. According to the quality level of the information content, only 1 video qualified as providing good, 7 videos as moderate, and 21 videos as providing poor information.
Conclusion: Healthcare professionals should be aware that videos shared on YouTube™ to provide information may have inadequate information content and quality and should guide patients to e-information sources that provide accurate and reliable information.
Keywords: *Cerebral Palsy, Children, YouTube, Video, Quality*

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INTRODUCTION

Cerebral palsy (CP) was defined as "a group of permanent disorders of the development of movement and posture, causing activity limitation that are attributed to non-progressive disturbances that occurred in the developing fetal or infant brain" (Rosenbaum et al., 2007). Frequently motor impairment is accompanied by secondary problems such as epilepsy, swallowing and eating difficulties, sensory and perception issues, behavioral problems, and musculoskeletal deformities (Rosenbaum et al., 2007; Sucuoğlu, 2017). CP is the most common childhood physical disability; its prevalence on a global scale is approximately 2.11 per 1000 live births. Prevalence of the disease decreases as a country's level of development increases (Oskoui et al., 2013). Treatment involves a multidisciplinary approach that includes physiotherapy, occupational therapy, pharmacological treatment and speech and language therapy. The aim is to provide children with continuous rehabilitation in order to have them reach their maximum potential and prevent functional decline (Vos et al., 2013). Cerebral palsy is a non-progressive disorder. On the other hand, the

disabilities caused by the disease and additional issues cause children with CP to need constant and special care (Majnemer et al.,2007; Sardana et al., 2016). Families who encounter this issue at a baby's birth or shortly afterwards are at the beginning of a challenging journey. Parents need to be able to accept the new situation and need help in their attempts to arrange their lives around the needs of their child (Saygi et al., 2015). It has been reported in studies (Buran et al., 2009; Saygi et al., 2015) that the most urgent need of parents of children with CP is to become informed about how to plan their child's future and the organizations that their child can benefit from. Since cerebral palsy is a long-term condition, parents' need for information and problem-solving will continue to be present throughout their lives (Rosenbaum, 2003). One of the trends in today's world is that people try to gather information from the internet, especially concerning matters of health (Yavuz et al., 2020). It is reported in the literature that eight out of every ten users of the internet use this medium to access health data (Atkinson et al., 2009; Hesse et al., 2006). At the same time, it has also been asserted that the number of websites on health is increasing at a faster speed than general internet use (Moretti et al., 2012) and that patients consider the internet a valuable source of health information (McMullan, 2006). One of the internet tools that is among the most commonly referenced by patients is the YouTube™ platform. YouTube™ is a preferred medium due to the wide visual content available, its capability of allowing the sharing of patient experiences, and its ease of accessibility (Bozkurt et al., 2019). However, videos shared on YouTube™ may contain misinformation or inadequate information because they do not have an evaluation process and are not regularly updated (Pamukcu and Izci Duran, 2021). Studies that have assessed the content of YouTube™ videos on various matters of health have revealed 17-19 that these videos may contain scientifically erroneous and misleading information that might have a negative impact on patient health. Therefore, it is important that individuals learn how to interpret the information accessed and how to evaluate the quality of the content (Hassona et al., 2016; Lim Fat et al., 2011; Ozturk and Gumus, 2021). This requires a developed health literacy capability. Health literacy is defined as the capacity to obtain the necessary basic health information and services, interpret and understand the knowledge collected in order to be able to make the right decisions (Ceyhan et al., 2020). It is reported in a study conducted in eight member countries of the European Union (Austria, Bulgaria, Germany, Greece, Ireland, Netherlands, Poland, Spain) that more than 10% of the total population has inadequate health literacy. One out of every two persons have been found to have limited health literacy (Sørensen et al., 2015). When it is considered that a relatively low number of people have developed health literacy skills, it is evident that the deficient and erroneous information disseminated in most YouTube™ videos is a matter that needs to be addressed. A scan of the literature did not reveal any study on the assessment of available English videos on cerebral palsy. Moreover, we believe that it is important to evaluate videos on this topic, as caregivers need constant information over their lifetime. This is why we attempted to assess the scientific content and quality of the English language YouTube™ videos related to cerebral palsy in the present study.

MATERIAL and METHODS

Purpose and Type of the Study

This is a cross-sectional study and the aim of this study was to investigate the scientific content and quality of YouTube™ videos on CP.

Sampling and participant

We performed a systematic search using the term "Children with Cerebral Palsy" in the YouTube™ platform on February 5, 2022. By using the Google Trends application, we found that the "Children with Cerebral Palsy" keyword had been frequently searched on Google by nonprofessional individuals. Google Trends is a trending search feature that shows how many times a particular search term was entered into our search engine over a specific time period. In the present study, the keywords "Children with Cerebral Palsy," "Cerebral Palsy and children," "Cerebral Palsy kids," and "Kids with Cerebral Palsy" were searched in the application. It was determined that the term "Children with Cerebral Palsy" was

used most frequently (Figure 1).

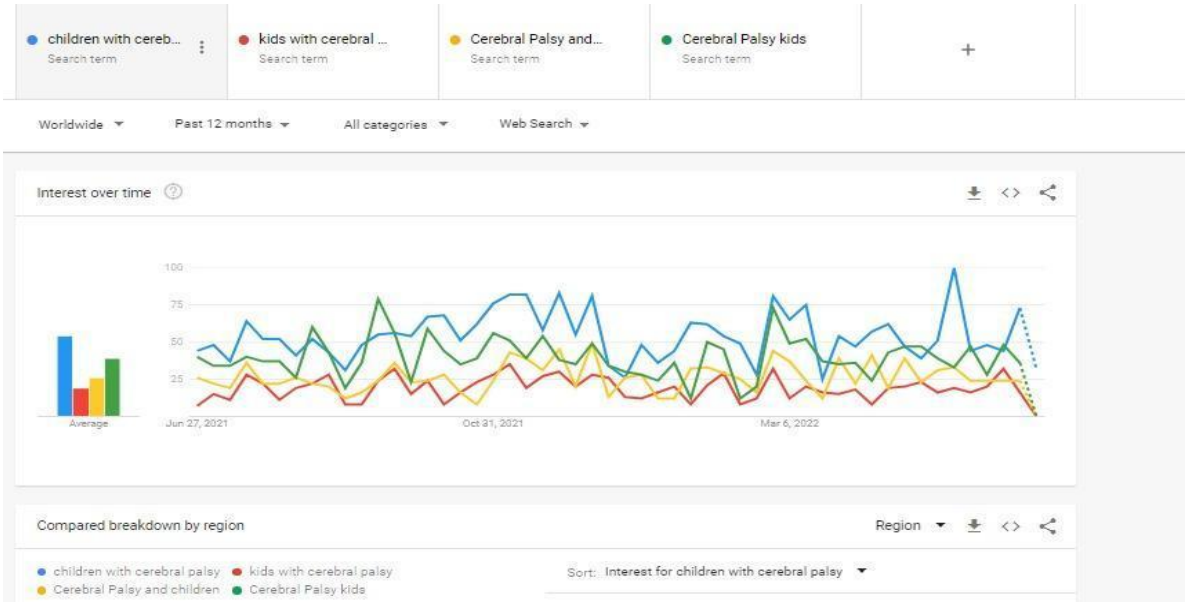

Figure 1. Keywords selection by using Google trends application

Two researchers independently performed the video scan (O.F. and S.D.) Cookies, cache and history were cleared and incognito mode was used on the YouTube™ website to avoid restrictions based on user history so that a broad range of search results could be extracted. Disagreements were resolved by consultation with a third researcher (MC) or by reaching final consensus after discussion. Studies show that 95% of people only look at the first three pages when searching online (Hegarty et al., 2017). In this study, searching was performed by selecting the number of views using the filter options and the top 60 videos were included for the evaluation. Video searches have been similarly performed using the filter "view count" like other studies in literature (Desai et al., 2013; Gokcen and Gumussuyu, 2019). The exclusion criteria were the following: non-English videos; advertisements; duplicate videos; unrelated videos; videos exceeding 15 minutes; videos with no audio or visual content.

Data Collection Tools

Characteristics of each video were recorded: Title of the video and Uniform Resource Locator (URL) information, Video length, Number of subscribers, Upload date, Days since upload, Source of upload (academic, health personnel/health institution, TV channels/news agencies, individual and commercial), Number of likes, Source of narration (patient/parents, health personnel, and voice-only), Number of comments, Video type (real, animation) and View count.

In most studies, video popularity was evaluated with the Video Power Index (VPI). The number of dislikes for YouTube™ videos can no longer be displayed, and therefore we were unable to calculate the VPI. We considered the view ratio to determine the popularity of the videos (Hassona et al., 2016).

View ratio= number of views / days

We assessed the overall quality of the videos with The Global Quality Scale (GQS). The GQS is a five-point Likert scale, with one point showing poor quality and five points indicating excellent quality (Bernard et al., 2007). We found no validated questionnaire about Cerebral Palsy in the literature. As in other studies, a useful scoring system specific to Cerebral Palsy was created and named the Cerebral Palsy Scoring System (CPss); in this system, scores were given for video specific content and quality (Erdem and Karaca, 2018; Staunton et al.,

2015). This new scoring system was set up by summarizing the main headings of the guideline "Cerebral palsy in under 25s: assessment and management" (UK, 2017) published in 2017 (Table 1). In creating the scoring system, the opinions of experienced experts (1 pediatrician, 1 physiotherapist, 1 statistician, 1 academic in pediatrics) were obtained. The video contents were divided into three groups: diagnostic information, associated comorbidities and treatment/rehabilitation information. Each item scored 1 point, resulting in a maximum score of 21 points (Table 1). Video quality was categorized as good information (15-21), moderately good information (8-14) and poor information (0-7).

Table 1. Cerebral Palsy Scoring System

Criteria		Mentioned	Not mentioned/incorrect information
Diagnostic information (0-5)	Definition (General Introduction)	1	0
	Classification	1	0
	Risk factors/ causes of Cerebral Palsy	1	0
	Diagnosis	1	0
	Clinical and developmental manifestations	1	0
Associated comorbidities (0-9)	Nutritional disturbance	1	0
	Mental health problems	1	0
	Epilepsy	1	0
	Speech, language and communication difficulties	1	0
	Behavioral difficulties	1	0
	Musculoskeletal problems	1	0
	Low bone mineral density	1	0
	Pain, discomfort, distress and sleep disturbance	1	0
	Other comorbidities (cognitive and learning disabilities, sensory disabilities, constipation, vomiting, regurgitation and reflux, hearing/visual impairment)	1	0
Treatment/ Rehabilitation (0-7)	Pediatric medicine	1	0
	Surgical treatment	1	0
	Physiotherapy	1	0
	Speech and language therapy	1	0
	Occupational therapy	1	0
	Orthotics and prosthesis rehabilitation	1	0
	Social care	1	0

Statistical Analysis

SPSS version 25.0 (SPSS Inc., Chicago, IL, USA) for Windows was used in the evaluation of the data. The distribution of the variables was measured with the Shapiro-Wilk test. The Mann-Whitney U-test was utilised in comparing the means of two non-normally distributed groups, whereas the Kruskal-Wallis test assessed the means of three or more groups. For post-hoc testing, the Dunn test was performed. Spearman Correlation analysis was performed for correlations between continuous variables and $p<0.05$ was accepted as statistical significance level. Intraclass correlation coefficients (ICCs) were used to determine the interobserver reliability. According to the ICCs values, interpretation is made as follows: A value of 0.9 is excellent, values between 0.9 and 0.8 are good, values between 0.8 and 0.7 are moderate and values below 0.7 is poor.[29,30] Cronbach's coefficient was used in the reliability analysis of the CPss items. Cronbach's alpha is a reliability test method that calculates the average value for each item or all items in the scale. A coefficient value of 0.70 and above indicates that the scale is reliable (Yavuz et al., 2020).

Ethical Approval

Informed consent and ethics committee approval is not required as the research is not a study involving direct human participants and/or animals.

RESULTS

As shown in Figure 2., a total of 60 videos were investigated and 29 videos met the inclusion criteria in the study.

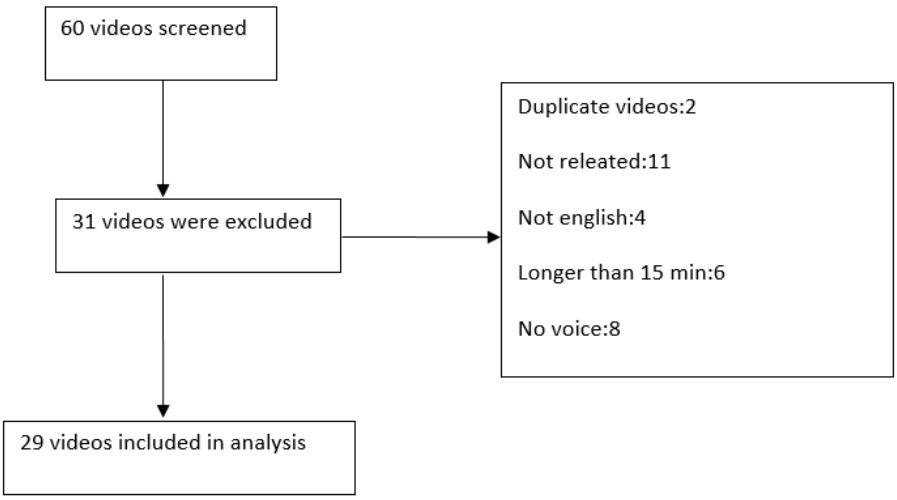

Figure 2. Flow diagram of present study

Table 2. General characteristics of the videos

Video characteristics	n	Median	Minimum	Maximum	Mean±SD
Number of views	29	287705	89550	4056026	481443.48±731478.42
Number of likes	29	1500	0.00	52000	5773.06±11736.49
Video length in minutes	29	5.15	1.30	13.36	5.89±3.23
Number of comments	29	273	0.00	2371	291.33±518.82
Number of subscribers	29	102000	1070	9680000	1376725.51±2701675.41
Days since upload	29	1785	567	21161	2697.17±3741.40
Viewing rate	29	139.55	30.48	2807.99	314.36±5.59

n: sample size, SD: standard deviation

The general characteristics of the videos are shown in Table 2. The number of views was 481,443.48±731,478.42 and 27 (93.1 %) of the videos were live-action videos. Fifteen videos were uploaded by health personnel or health institutions and 13 (44.8%) videos were narrated by patients/parents. Among the videos, 43.44% of the videos included diagnostic information, while 23.3% contained treatment-related information, and 21.18% provided information about associated comorbidities.

The evaluation of video characteristics according to video sources is displayed in Table 3. As regards video sources, statistically significant differences were found between the groups in terms of video length, the viewing rate, and the number of comments ($p<0.05$). According to the results of the post-hoc analysis, videos produced by individuals were longer than videos uploaded by health personnel/health institutions ($p=.042$). The videos uploaded by the TV channels/news agencies had a higher viewing rate than the videos uploaded by academics ($p=.008$).

The mean GQS score was 1.96 ±1.34; the CPss score was 5.75±4.08. Spearman's correlation analysis showed a significant correlation between GQS and CPss scores ($r=0.889$, $p<0.05$). The GQS scores showed positive relationships with CPss scores (Table 4).

An evaluation of quality scores according to video source and video information content are displayed in Table 5. The results of multiple comparison analysis showed that there was no statistical difference between GQS and CPss scores in terms of video source and video content ($p>0.05$). The GQS and CPss scores were higher in animation videos than in live-action videos ($p<0.05$). In addition, the videos narrated by voice-overs had higher GQS and CPss scores than videos narrated by patients/parents or health personnel ($p<0.05$).

Table 3. Evaluation of videos according to the video source

Variables	Academic[a] (n=2)	Health personal/ health institution [b] (n=15)	TV channels/news agencies[c] (n=2)	Individual[d] (n=4)	Commercial[e] (n=6)	P-value	Multiple comparison Dunn Test
	Median (Q.25-Q.75)	Median (Q.25-Q.75)	Median (Q.25-Q.75)	Median (Q.25-Q.75)	Median (Q.25-Q.75)		
Number of views	510014 (114992-905036)	188628 (115050-383210)	2289485.5 (522945-4056026)	581042 (374711-724353.5)	422895 (418215-478905.5)	0.153	
Number of likes	6174 (348-12000)	680 (546.5-1700)	23550 (8100-39000)	4900 (3350-8950)	10000 (5700-31000)	0.060	
Video length in minutes	4.49 (2.49-6.50)	4.07 (3.335-4.71)	7.23 (7.14-7.32)	13.17 (9.73-13.26)	5.15 (4.08-7.71)	*0.042	b-d
Number of comments	276 (28-524)	69 (16.5-126.5)	1523.5 (676-2371)	327 (290-473)	22 (12.5-152)	*0.037	
Number of subscribers	1164700 (29400-2300000)	102000 (6130-171000)	9675000 (6970000-9680000)	18600 (11020-2489300)	3210000 (1608060-4105000)	0.130	
Days since upload	12363.5 (3566-21161)	1970 (1409-2226.5)	1170,5 (895-1446)	1052 (809.5-1221)	1633 (1443-2207.5)	0.071	
Viewing rate	37.50 (32.24-42.76)	87.89 (68.60-171.11)	1694.64 (584.29-2804.99)	418.01 (289.03-974.14)	253.23 (222.75-295.37)	*0.008	a-c

*: Kruskal Wallis Test, n: sample size, Q: quartile

Table 4. Comparison of GQS and CPss scores

Video Quality	n	Mean±SD		
Global quality scale	29	1.96±1.34	r	.889
CPss	29	5.75±4.08	p	<0.01

n: sample size, SD: standard deviation, CPss: Cerebral Palsy scoring system

Table 5. GQS and CPss scores according to characteristics of the videos

	GQS		Multiple comparison	CPss		Multiple comparison	n (%)
Video characteristics	Median (Q.25-Q.75)	P-value	Dunn Test GQS	Median (Q.25-Q.75))	P-value	Dunn Test CPss	
Video source							
Academic	3(1-5)			8.5(2-15)			2(6.9)
Health personal/health institution	2(1.5-3)			6(4.5-9.5)			15(51.7)
TV channels/news agencies	1(1-1)	p[1]=.728		4(3-5)	p[1]=.896		2(6.9)
Individual	1(1-1.5)			3(1.5-5.5)			4(13.8)
Commercial	2(1.5-2.5)			7(4.5-7.5)			6(20.7)
Video type							
Live-action	1(1-2)	**p[2]=.010**		4(3-7)	**p[2]=.005**		27(93.1)
Animation	5(5-5)			15.5(15-16)			2(6.9)
Narrator							
Patients/parents [a]	1(1-1)		a-c	4(3-5)		a-c	13(44.8)
Health personnel [b]	1.5(1-2)	**p[1]=.001**	b-c	3.5(2-8)	**p[1]=.011**	b-c	10(34.5)
Voice-overs [c]	4.5(2-5)			11.5(7-15)			6(20.7)

[2]:Mann Whitney-U Test [1]:Kruskal Wallis Test, n:sample size, Q:quartile, GQS: Global quality scale, CPss: Cerebral Palsy scoring system

According to the quality level of information content, only 1 video qualified as good, 7 videos were moderately good and 21 videos were assessed as providing poor information (Table 6). In the multiple comparison analysis, a significant difference in GQS was found in CPss scores between groups.

Interobserver reliability was evaluated and ICCs were calculated. In the CPss, the total ICC value was 0.955 (p<0.001), 0.942, (p<0.001) in the diagnostic information subgroup, 0.910 (p<0.001) in the other comorbidities subgroup, and 0.916 (p<0.001) in the treatment subgroup. There was excellent compliance between two observers. According to the reliability analysis, the Cronbach coefficient of the 21-item CPss was 0.87.

Table 6. Evaluation of videos according to the video content

Variables	Good information[a] (n=1) (3.4%)	Moderate information[b] (n=7)(24.1%)	Poor information[c] (n=21)(72.4%)	p	Multiple comparison Dunn Test
	Median	**Median(Q.25-Q.75)**	**Median(Q.25-Q.75)**		
Number of views	496444	491417(203276-557979)	350620(116758-522945)	.541	
Number of likes	7900	1400(546.5-6750)	1950(680-8100)	.620	
Video length in minutes	13.18	5.18(4.24-6.395)	4.62(3.27-7.19)	.284	
Number of comments	219	125(36-375.5)	117(28-282)	.911	
Number of subscribers	2400000	121000(54065-1260500)	65700(6130-3210000)	.544	
Days since upload	1546	2063(1680-3751)	1467.5(1052-1972)	.400	
Viewing rate	321.11	87.89(61.06-215.24)	180.17(76.11-450.45)	.540	
Global quality scale	5	4(2.5-4.5)	1(1-2)	**<0.01**	**b-c**

n: sample size, Q: quartile

DISCUSSION

It can easily be said that in recent years, the YouTube™ platform has become the most commonly consulted information resource (Simsek et al., 2020). Various studies in the literature on matters of health present evaluations of the content of videos appearing on YouTube™ (Clerici et al., 2012; Erdem and Karaca, 2018; Hassona et al., 2016; Lim Fat et al., 2011; Mukewar et al., 2013; Simsek et al., 2020). We found only one study in the literature from Brazil in Portuguese where videos on CP were discussed (Furtado et al., 2022). CP is the most common cause of physical disability in children and adolescents (Sellier et al., 2016). When it is considered that individuals with CP and their caregivers are in need of information throughout their lives, it is clear that videos should be scrutinized so that people may access the most accurate and high quality sources of knowledge. In this study, we examined the knowledge and quality content of English language YouTube™ videos about children with CP. Our study is the first to explore the reliability and quality of English language YouTube™ videos about children with CP. In the light of the insufficient evidence-based knowledge published regarding English videos on children with CP, the results of the present study are valuable.

There are differences among videos uploaded from different sources. In comparing the features of videos originating from various sources, we saw that the highest numbers of views, likes, comments, subscribers and the highest levels of ratings belonged to videos created by TV channels and news networks (Table 3). Accordingly, a study by Bicer et al. (2021) revealed that videos produced by TV channels and news networks had the highest number of pageviews (Bicer et al., 2021). The quality of the source may have an impact on the access ranking of videos. The fact that TV channels and news networks already have a viewing audience may be a factor that increases the accessibility of videos. The high numbers of views, likes, comments, and subscriptions as well as the high rating percentages recorded despite the fact that only 6.8% of videos originate from TV channels and news networks suggest easy accessibility.

We noted that although the videos uploaded by academics and health professionals/institutions contain much more information, these videos had the lowest viewing rates (Table 3). The low rate of referring to these videos, despite the fact that they contain more accurate and reliable information, is consistent with the conclusion of Desai et al. that " educational videos are viewed less than low-quality videos" (Desai et al., 2013). Accessibility and comprehensibility have as much an effect on viewing rates as content (O'Neill et al., 2014; Staunton et al., 2015). Consequently, this finding led us to conclude that individuals watching videos on health topics tend to watch the first video they can access without considering its source or content. Our results indicate that the longest videos are those that are uploaded from individual accounts. Videos uploaded by health professional or institutions showed significant differences (Table 3). Simsek et al. (2020) similarly found in their study that videos originating

from individual accounts were the longest. We believe that videos produced by individuals are longer because they contain references made to the individual's personal life experiences.

GQS was used in the study to assess the quality of the videos. It has been noted that GQS is the most commonly preferred method of measurement used to analyze the quality of videos in similar studies (Erdem and Karaca, 2018; Furtado et al., 2022; Oztermeli and Karahan, 2020; Sadry and Buyukbasaran, 2021). In our study, the mean GQS score was considerably low (1.96±1.34) (Table 4). A study conducted on developmental dysplasia of the hip found GQS to be 2.46±1.09 (Oztermeli and Karahan, 2020). In a study conducted by Sadry and Buyukbasaran in 2021 on orthodontic clear aligners, GQS was found to be 1.72±0.93. Ozturk and Gumus (2021) reported GQS as 1.79±0.83 in their study on videos related to dental treatment in children. The figure was 1.68±0.87 in a study on kyphosis (Erdem and Karaca, 2018). It can be seen that the results of these studies displayed a low mean for GQS. Our findings were consistent with results reported in other studies on medical topics, indicating that videos appearing on YouTube™ were generally low in quality.

The authors of the present study assessed the information content in the videos with a CPss they developed themselves. It can be said that the results of the analysis showed that the CPss was an adequate, accurate and valid instrument to use in the assessment of video content quality (Cronbach's alpha 0.87). The mean score was found to be 5.75±4.08 on the basis of 21 points (Table 4). This demonstrated considerably low video content quality. Only 21.18% of the videos included in our study have information content about associated comorbidities. It is known that children with cerebral palsy can have additional conditions such as intellectual disability, nutritional problems, problems with the senses, epilepsy, or other systemic disorders (UK, 2017). In the context of the results of our study, we think there is a need for many more videos on secondary problems related to CP and its treatment.

A positive and significant correlation was found between the mean scores obtained from the overall GQS and CPss tools in which we evaluated the quality and content of the videos. (Table 4; $p<0.01$). This finding shows that videos with enriched content are high quality. Two different types of videos were assessed in the study: reels and animated videos. The mean GQS and CPss scores of the animated videos were found to be significantly higher ($p<0.05$). The animation videos in our study consist of videos prepared by academic institutions for educational purposes. It is thought that the high scores of animation videos are due to the fact that they are prepared by academic institutions. In the comparison of GQS and CPss mean scores in terms of the narrating source, it was seen that voice-over videos displayed significantly higher mean GQS and CPss scores ($p<0.05$). Voice-over videos were generally produced by academic institutions or hospitals/health professionals and designed to provide information. It can be said that the fact that the text of the videos pertained to a specific topic and was narrated in an orderly fashion raised the quality of the production.

We found in our study that videos with a low level of informative content (72.4%) were more numerous and that videos displaying high quality information content were relatively few (6.8%). In this context, the results of our study are consistent with those reported in other studies that assess YouTube™ videos on health topics (Ozturk and Gumus, 2021; Simsek et al., 2020). Our study has some limitations. Because the YouTube™ platform is a constantly changing medium, any subsequent search may deliver different results. At the same time, studies reveal that when users search for a particular keyword in the literature, they are likely to view the first 60 videos they encounter. From this perspective, the fact that we assessed only 29 videos that met our criteria is a limitation of our study. Another limitation of our study is that videos longer than 15 minutes were not included. Because there is no other tool available to assess YouTube™ videos, our evaluation based on the GQS and the CPss created by the authors may also be considered a limitation.

CONCLUSION

This study demonstrated that the highest numbers of views, likes, comments, subscribers and the highest levels of ratings belonged to videos created by TV channels and news networks. Videos uploaded by academics and health professionals/hospitals had the lowest view counts. It was noted that GQS and CPss mean scores were considerably low and that there was a significant and positive correlation between overall mean scores. We determined that most of the videos studied had a poor level of informative content. Our findings showed that videos on CP on YouTube™ were of poor quality and provide users with inadequate information. This may be a result of the fact that information shared on YouTube™ can be provided not only by hospitals and health professionals but also by commercial enterprises, individuals and users from all segments of society in the absence of any standards imposed on video content. It can also be said that the ease with which videos can be uploaded to the platform without being subjected to any kind of control mechanism is a factor that affects the level of information provided. A large majority of videos have limited content, which may have a negative impact on the behaviors of CP patients and their parents. Our recommendation would be that videos uploaded to YouTube™ are subjected to quality and content control in the light of standardized criteria. Health professionals as well as physiotherapists and nurses working with children with cerebral palsy and their parents need to be aware of the content available on video-sharing platforms and should be ready to direct their patients to e-information sources that provide accurate and reliable information. The internet/health literacy of patients and their parents must also be raised.

Conflict of Interest

The authors declare no conflict of interest.

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Self-efficacy, Professional Values and Related Factors: A Group of Senior Nursing Students

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ABSTRACT:
Purpose: The present study was conducted to determine senior nursing students' self-efficacy and professional values levels and related factors.
Material and Methods: In this descriptive type study, the data were collected using the Descriptive Information Form, Self-Efficacy Scale and Professional Values Scale.
Results: The Self-Efficacy Scale and Professional Values Scale mean scores of the students were 85.73±10.24 and 101.84±15.47 respectively. The comparison of the mean scores obtained from the Self-Efficacy Scale in terms of the variables such as sex, choosing nursing willingly, and their participation in scientific and social activities organized at the university demonstrated that there were statistically significant differences between the participants' mean scores ($p<.05$). There was no statistically significant difference between their mean scores obtained from the Professional Values Scale in terms of any of their descriptive characteristics ($p>.05$).
Conclusion: It was concluded that nursing students acquired self-efficacy and professional values in nursing education.
Keywords: *Nursing Students, Self-Efficacy, Professional Values*

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INTRODUCTION

Self-efficacy is a concept that defines how individuals determine their judgments, behaviors, thoughts and emotional reactions regarding their own abilities (Bandura, 1982). Self-efficacy in nursing is the individual's belief that he or she has the necessary knowledge, skills and abilities to provide safe and quality patient care (Grimm, 2018). Nursing education includes both the theoretical and practical training. In this training, new skills are learned. These skills are then put into practice. Therefore, students' having strong self-efficacy plays an important role in their being more confident and successful (Yua et al., 2021; Zhang et al., 2015). It is important for them to have self-efficacy skills and make decisions in line with professional values in order to produce solutions when they are faced with complex and difficult cases during clinical practices, and in case they have dilemmas when they have to make decisions on ethical issues (Çöplü and Kartın, 2019; Dönmez and Özsoy, 2016; Kavradım et al., 2019). Health personnel's having strong self-efficacy and professional values ensures good healthcare outcomes (Dellafiore et al., 2021). Today, due to the complex structure of health systems and the increasing demand for health-related issues, nurses are expected to have high levels of self-efficacy and professional values (Çöplü and Kartın, 2019; Dellafiore et al., 2021). Weis and Schank (2009) define professional values as standards accepted by professional groups and individuals, and used to evaluate the integrity of an individual or

organization. They also state that professional values are necessary to reinforce the professional identity and performance of individuals (Weis and Schank, 2009). It is stated that professional values in nursing include important nursing principles such as human dignity, honesty, self-sacrifice and justice, which serve as a framework for standards, professional practices and evaluations (Schmidt and McArthur, 2018). Therefore, professional values enable the creation of care action, provision of qualified care to meet the health needs of individuals, and achievement of better care outcomes (Can and Acaroğlu, 2015; Dellafiore et al., 2021). If ethical dilemmas arise while an individual is given care, one should act with professional values beyond personal values (Göriş et al., 2014). The development of professional values begins during school years and continues after graduation (Can and Acaroğlu, 2015; Çöplü and Kartın, 2019; Kantek et al., 2017). Especially, senior nursing students should gain self-efficacy skills and professional values during their education and be ready for professional nursing (Jun and Lee, 2016).Therefore, determination of nursing students' self-efficacy and professional values in the education processes, and factors influencing these skills is of great importance.

MATERIAL and METHODS

Purpose and Type of the Study

The data of this descriptive type study were collected in the spring semester of the 2020-2021 academic year. Because the study was conducted during the Covid-19 pandemic, education was given through online or face-to-face training. Therefore, the study was carried out by sharing the online form over social media accounts.

Our research questions are as the follows:

What is the self-efficacy status of senior nursing students?

What is the professional values status of senior nursing students?

What are the factors affecting self-efficacy and professional values in senior nursing students?

Sampling and Participant

The study population consists of fourth-year nursing students chosen by the snowball sampling method. After the study was completed, G Power 3.19.2 was used to calculate the appropriate sample size for a study with sufficient power. Post hoc and the effect size were determined with the t-test based on the mean scores the participants in the sample obtained from the scales, and the standard deviation. In line with the data obtained at the end of the study, it was determined that the power of the study was 99%, α was 0.05, and the effect size was 0.52, based on the mean score for the Self-Efficacy Scale. The study sample consisted of 138 nursing students who volunteered to participate in the study and met the inclusion criteria. Inclusion criteria were as follows: (a) being a 4th year student in the nursing department, (b) willing to participate in the study, (c) being able to read in Turkish, (d) being users of Facebook, WhatsApp, Instagram; and (e) completing the questionnaire. Exclusion criteria were as follows: (a) being a 1st, 2nd or 3rd year student in the nursing department (b) not answering the survey questions appropriately.

Data Collection Tools

The data were collected using the Descriptive Information Form, Self-Efficacy Scale and the Professional Values Scale.

Introductory Information Form: The items in the form question the participating nursing students' descriptive characteristics such as age, sex, economic status, place of residence, etc.

Self-Efficacy Scale: The scale developed by Sherer et al. (1982) and adapted into Turkish by Gözüm and Aksayan (1999) is used to assess students' perceptions of self-efficacy (Gözüm and Aksayan, 1999; Sherer et al., 1982). The scale consists of 23 items whose responses are rated on a five-point Likert type scale ranging from 1 to 5 (1-'Does not describe me at all', 2- 'Describes me a little', 3- 'I am undecided', 4- 'Describes me well', 5- 'Describes me very well'). Items 2, 4, 5, 6, 7, 10, 11, 12, 14, 16, 17, 18, 20, 22 are reverse scored. The minimum and maximum possible scores to be obtained from the scale are 23 and 115 respectively. The scale has the following four sub-dimensions: starting the behavior (items 2, 11, 12, 14, 17, 18, 20, 22), maintaining the behavior (items 4, 5, 6, 7, 10, 16, 19), completing the

behavior (items 3, 8, 9, 15, 23) and dealing with obstacles (items 1, 13, 21). The higher the score obtained from the scale is the higher the level of general self-efficacy perception is. The Cronbach's Alpha internal consistency coefficient of the scale was 0.89 in Gözüm and Aksayan's (1999) study and 0.71 in the present study.

Professional Values Scale: The scale was developed by Weis and Schank (2009) (Weis and Schank, 2009). Acaroğlu (2014) performed the validity and reliability study of the Turkish version of the scale (Acaroğlu, 2014). The scale consists of 26 items whose responses are rated on a five-point Likert type scale ranging from 1 to 5 (1-not important, 2-somewhat important, 3-important, 4-very important, 5-most important). The scale consists of three dimensions: caring (items 10, 12 - 25), professionalism (items 4 - 9, 11, 26) and trust (items 1, 2, 3). The lowest and highest possible scores to be obtained from the scale are 26 and 130 respectively. The higher the mean score obtained from the scale is the higher the level of professional values is. The Cronbach's alpha coefficient of the scale was 0.92 in Weis and Schank's study, 0.96 in Acaroğlu's study (2014), and 0.75 in the present study.

Statistical Analysis

The SPSS package program was used to analyze the data. Numbers, percentages, arithmetic mean, and standard deviation were used in the analysis of the descriptive data. Kolmogorov Smirnov test was used to find out whether the variables were distributed normally. The independent samples t test was used to compare the normally distributed data in paired groups, and the Mann Whitney U test was used to compare the data without normal distribution in paired groups. One Way ANOVA test was used to compare the normally distributed data in three groups, and Kruskal Wallis test was used to compare the data without normal distribution in three groups. P-values less than 0.05 were considered statistically significant.

Ethical Approval

In order to conduct the study, ethics committee approval (March 17, 2021/20) was obtained from University Ethics Committee. The students to participate in the study were asked to read the informed consent section of the online questionnaire and to give their consent indicating that they volunteered to participate in the study.

RESULTS

Of the nursing students who participated in the study, 65.9% were between the ages of 19 and 22, 73.2% were women, 30.4% were from the Eastern Anatolia region of Turkey, 49.3% stated that the place where they lived the longest was a district, 66.7% were students at universities in the Central Anatolia region of Turkey, 67.4% had face-to-face education, 74.6% had income lower than their expenses, 48.6% perceived their school success as good, 67.4% graduated from Anatolian High School (public high schools in Turkey, where some lessons are taught in English, German or French), and 63.8% and 63% participated in the scientific and social activities organized at the university respectively (Table 1). Of the nursing students, 81.2% chose nursing willingly, and 71.0% placed the nursing profession in the first place in the preference list at nationwide University Entrance Exam (In Turkey, students should take a nationwide University Entrance Exam to enter a university. Those who pass the exam make a list of schools in the order indicating their preferences), 55.1% stated that they preferred nursing because it was the profession they wanted to be in, 92.0% were satisfied with their nursing education, 52.9% thought that they were ready to do the nursing profession, 36.2% wanted to work in surgical clinics, and 87% were not a member of any professional association (Table 1).

The mean scores the students obtained from the Self-Efficacy Scale and Professional Values Scale were 85.73±10.24 and 101.84±15.47 respectively (Table 2).The comparison of the mean scores obtained from the Self-Efficacy Scale in terms of the variables such as sex, choosing nursing willingly, and their participation in scientific and social activities organized at the university demonstrated that there were statistically significant differences between the participants' mean scores ($p<.05$) (Table 3).

The female students, those who chose the nursing

department willingly, and those who participated in scientific and social activities organized at the university obtained higher scores from the Self-Efficacy Scale (Table 3).The comparison of the mean scores obtained from the Self-Efficacy Scale in terms of the variables such as age, economic status, longest place of residence, region of study and residence, school success, type of high school graduated, type of education, the reason for choosing the nursing department, the place of nursing in the preference list, satisfaction with nursing education received, feeling ready for professional nursing, the field intended to work in after graduation, and membership of a professional association demonstrated that there were not statistically significant differences between the participants' mean scores ($p>.05$) (Table 3). There was no statistically significant difference between the students' mean scores they obtained from the Professional Values Scale in terms of their descriptive characteristics ($p>.05$) (Table 3).

Table 1. Socio-demographic characteristics of nursing students (n=138)

Characteristics	Number	Percent
Age		
19-22	91	65.9
23-26	47	34.1
Gender		
Female	101	73.2
Male	37	26.8
Living place		
Province	42	30.4
District	68	49.3
Village	28	20.3
Region of residence		
Central Anatolia	21	15.2
Marmara	16	11.6
Black Sea	8	5.8
Aegean	20	14.5
Eastern Anatolia	42	30.4
Southeastern Anatolia	14	10.1
Mediterrenian	17	12.3
Region of study		
Central Anatolia	92	66.7
Marmara	15	10.9
Eastern Anatolia	11	8.0
Black Sea	11	8.0
Southeastern Anatolia	9	6.5
Education type during the pandemic		
Online education	45	32.6
Face-to-face education	93	67.4
Income level		
Income is lower than expense	103	74.6
Income equals to expense	24	17.4
Income is more than expense	11	8.0
School success		
Very good	15	10.9
Good	67	48.6
Moderate	53	38.4
Bad	3	2.2
High school type		
Science high school	24	17.4
Anatolian high school	93	67.4
Normal high school	21	15.2
Participation in the scientific activities at the university		
Participated	88	63.8
Not participated	50	36.2
Participation in the social activities at the university		
Participated	87	63.0
Not participated	51	37.0
Preferring nursing willingly		
Yes	112	81.2
No	26	18.8

Table 1. (Continued) Socio-demographic characteristics of nursing students (n=138)

Characteristics	Number	Percent
Reason for choosing nursing department		
Easy entry job	44	31.9
Desired profession	76	55.1
According to exam score	6	4.3
Family preference	12	8.7
Nursing department order in the preference list		
1. order	98	71.0
2-18. order	40	29.0
Satisfaction with nursing education		
Satisfied	127	92.0
Unsatisfied	11	8.0
Feeling ready to do the nursing profession		
Ready	73	52.9
Unready	65	47.1
Desired clinic to work after graduation		
Internal medicine clinic	33	23.9
Surgical clinic	50	36.2
Obstetrics clinic	16	11.6
Child health clinic	3	2.2
Psychiatry clinic	17	12.3
Public health	19	13.8
Member of professional associations		
Yes	18	13.0
No	120	87.0

Table 2. Self-efficacy scale and professional values scale mean scores (n=138)

Scale	Scale Minumum-Maximum Score	Received Minumum-Maximum Score	$\bar{x}$±SD
Self-efficacy	23-115	63-106	85.73±10.24
Professional values	26-130	37-128	101.84±15.47

SD: standard deviation, $\bar{x}$:mean

Table 3. Self-efficacy scale and professional values scale mean scores according to the students' socio-demographic characteristics (n=138)

Characteristics	Self-Efficacy $\bar{x}$±SD	z/p	Professional Values $\bar{x}$±SD	z/p
Age				
19-22	85.25±10.59	-0.726/0.468[a]	103.75±14.33	-1.902/0.057[a]
23-26	86.65±9.58		98.12±17.02	
Gender				
Female	87.07±10.35	2.605/**0.010**[b]	103.0±14.63	-1.530/0.126[a]
Male	82.05±9.09		98.64±17.39	
Income level				
Income is lower than expense	85.03±10.02	2.466/0.089[c]	101.79±15.65	4.184/0.123[d]
Income equals to expense	85.75±10.15		106.33±8.38	
Income is more than expense	92.18±11.17		92.45±21.79	
Living place				
Province	86.76±10.11	1.353/0.262[c]	98.95±18.59	4.605/0.10[d]
District	86.25±9.99		101.89±12.39	
Village	82.92±10.92		106.03±16.67	
Region of residence				
Central Anatolia	84.09±9.69	0.791/0.579[c]	94.90±22.59	1.719/0.121[c]
Marmara	87.50±10.91		106.12±6.05	
Black Sea	88.12±5.46		95.87±17.54	
Aegean	82.05±13.67		101.95±18.81	
Eastern Anatolia	86.92±7.96		101.23±12.84	
Southeastern Anatolia	86.85±14.55		104.78±15.73	
Mediterrenian	85.41±8.30		108.11±7.03	

Table 3. (Continued) Self-efficacy scale and professional values scale mean scores according to the students' socio-demographic characteristics (n=138)

Characteristics	Self-Efficacy $\bar{X}$±SD	z/p	Professional Values $\bar{X}$±SD	z/p
Region of study				
Central Anatolia	86.25±10.17	0.390/0.815[c]	101.56±15.94	1.330/0.262[c]
Marmara	86.26±10.55		100.40±14.92	
Eastern Anatolia	82.81±9.53		99.54±12.06	
Black Sea	83.72±11.19		99.36±18.28	
Southeastern Anatolia	85.55±11.57		112.88±7.84	
School success				
Very good	87.13±9.17	0.189/0.903[c]	105.66±9.99	2.722/0.436[d]
Good	85.74±10.88		102.53±17.15	
Moderate	85.49±10.05		99.66±14.83	
Bad	82.66±6.02		105.66±2.08	
High school type				
Science high school	89.41±7.36	1.913/0.152[c]	105.45±8.93	0.992/0.374[c]
Anatolian high school	84.89±10.42		100.64±17.26	
Normal high school	85.23±11.70		103.0±12.41	
Education type during the pandemic				
Online education	84.46±11.61	-1.009/0.315[b]	101.75±15.36	-0.032/0.975[a]
Face-to-face education	86.34±9.52		101.88±15.61	
Preferring nursing willingly				
Yes	86.82±10.02	2.648/**0.009**[b]	101.07±15.68	-0.986/0.324[a]
No	81.03±10.06		105.15±14.37	
Reason for choosing nursing department				
Easy job entry	84.61±10.57	1.544/0.206[c]	100.81±16.49	0.785/0.853[d]
Desired profession	86.23±10.30		102.46±14.78	
According to exam score	79.66±7.20		102.83±21.46	
Family preference	89.66±8.92		101.16±14.57	
Nursing department order in the preference list				
1. order	86.06±10.50	0.589/0.557[b]	102.65±14.46	-0.054/0.957[a]
2-18. order	84.92±9.68		99.85±17.75	
Satisfaction with nursing education				
Satisfied	86.11±10.08	-1.306/0.192[a]	101.62±16.07	-0.397/0.691[a]
Unsatisfied	81.27±11.51		104.36±4.47	
Participation in the scientific activities at the university				
Participated	88.68±10.04	4.766/**0.000**[b]	100.86±15.15	-1.099/0.272[a]
Not participated	80.68±8.54		103.50±16.02	
Participation in the social activities at the university				
Participated	88.47±9.63	-4.348/**0.000**[a]	102.22±14.60	-0.104/0.917[a]
Not participated	80.90±9.55		101.16±17.03	
Feeling ready to do the nursing profession				
Ready	87.64±9.28	2.361/0.020[b]	101.54±14.05	-0.521/0.602[a]
Unready	83.58±10.91		102.16±17.04	
Desired clinic to work after graduation				
Internal medicine clinic	87.39±9.73	0.515/0.764[c]	100.0±17.27	2.092/0.836[d]
Surgical clinic	86.12±10.08		103.80±14.47	
Obstetrics clinic	84.81±9.46		101.75±19.67	
Child health clinic	88.33±8.73		102.66±5.03	
Psychiatry clinic	84.58±12.22		98.94±15.38	
Public health	83.21±11.07		102.31±12.73	
Member of professional associations				
Yes	83.83±11.46	-0.842/0.401[b]	98.22±17.04	-0.775/0.438[a]
No	86.01±10.07		102.38±15.23	

SD: standard deviation, $\bar{X}$:mean, a:Mann Whitney U test, b:Independent Samples t test, c:One Way ANOVA, d:Kruskal Wallis test

DISCUSSION

All knowledge, skills and behaviors related to nursing are acquired during the education process. Self-efficacy and professional values are among those gained in this process. Self-efficacy helps senior nursing students to feel competent enough, and ready for transition to professional nursing (Alavi, 2014). In the present study, the nursing students' self-efficacy level was good (85.73±10.24). In other studies in which nursing students' self-efficacy status was investigated, similar results were obtained (Dikmen et al., 2016; Ibrahim et al., 2019; Kızılcı et al., 2015; Mohamadirizi et al., 2015). That the nursing students' self-efficacy status was good indicates that they acquired the competencies required for the profession during the education

process. The most important finding in the present study in terms of self-efficacy was that the female students, those who chose the nursing department willingly, and those who participated in scientific and social activities organized at the university obtained significantly higher scores from the Self-Efficacy Scale. For many years, the nursing profession in our country was performed by women. In recent years, male students started to choose nursing: however, the number of male students is still not many (Kızılcı et al., 2015). The reason why the self-efficacy level was higher in female students in the present study may have stemmed from the fact that the majority of the participants were female students. Students' choosing the nursing department of their own free will affects their self-efficacy levels positively (Dikmen et al., 2016). In our country, the score obtained in the university entrance exam greatly affects students' preference (Alkaya et al., 2018). The results of our study revealed the importance of the students' placement in a department suitable for them in line with their wishes and expectations. After students make their preference, the educational and didactic activities organized by the university prepare them for the profession before graduation. Another important finding of our study is that the variables such as age, economic status, longest place of residence, region of study and residence, school success, type of high school graduated, type of education, the reason for choosing the nursing department, the place of nursing in the preference list, satisfaction with receiving nursing education, feeling ready for the nursing, the field intended to work in after graduation, and membership of a professional association did not affect the mean scores obtained from the Self-Efficacy Scale. In the literature, age, educational status (Zhang et al., 2015) and academic achievement have been determined to affect self-efficacy (Khan et al., 2015). Most of the students in the present study were in the same age group and all of them were senior students. The difference between studies in terms of academic success may have stemmed from such factors as intelligence, interest and participation in lessons, and study activities in addition to self-efficacy. As in our study, in several other studies, such factors as the place of residence (Özpulat and Özvarış, 2019), reason for choosing the nursing department, satisfaction with receiving nursing education (Açıksöz et al., 2016) and the economic status (Dikmen et al., 2016) did not affect self-efficacy. Since the concept of self-efficacy includes the individual's belief and effort in performing an activity, the way training is given, thoughts about the nursing department (preference, feeling ready, field intended to work in and membership) may not affect self-efficacy.

Professional values are a guide in nursing practices (Dellafiore et al., 2021). The students participating in our study had strong professional values (101.84±15.47). In other studies in which the professional values of nursing students in Turkey were investigated (Alkaya et al., 2018:101.6 ± 17.0, Ayla et al., 2018:103.25±16.96, Dönmez and Özsoy, 2016:99.45±1.96, Paşalak et al., 2021:113.5 ±12.8,), their levels of professional values were determined as good. All these results suggest that the professional values levels of nursing students studying at different universities in our country are similar and high. This result is very important because it indicates that nursing students gain professional values before they start professional nursing. Another important finding of our study regarding professional values is that the students' descriptive characteristics did not affect their levels of professional values ($p>.05$). Similarly, there are several studies indicating that demographic variables such as students' age, sex, marital status, general academic grade point average, ethnicity, work experience, and participation in professional ethics training courses do not significantly affect students' levels of professional values (Nelwati et al., 2019; Poorchangizi et al., 2019). In another study, it was determined that personal and environmental factors played a significant role in the development of professional values in nursing students (Shafakhah et al., 2018). Nursing education positively contributes to the development of professional values of its members (Kantek et al., 2017; Kavradım et al., 2019). However, students start their education with the personal values they have gained from their families and continue by integrating their own values with the professional values during their education process. Therefore, not only demographic

characteristics but also many other factors may affect professional values, which suggests that more and more in-depth studies should be conducted on the issue.

CONCLUSION

In this multi-centered study, that the students had good professional values and self-efficacy levels indicates that they acquired the necessary competencies for nursing and that nursing education was carried out in a similar way in different schools. However, the reflection of these skills on effective nursing care is very important. While they give care to the patient, nurses should have strong self-efficacy and manage the nursing process within the framework of professional values. In the future, a larger number of studies should be conducted to reveal other factors likely to affect students' levels of self-efficacy and professional values.

Conflict of Interest

The authors declare no conflict of interest.

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Adaptation of the Short Questionnaire to Assess Changes in Lifestyle-Related Behaviors During Covid-19 Pandemic in Turkish: A Validity Reliability Study

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ABSTRACT:
Purpose: In this study, ''A Short Questionnaire to Assess Changes in Lifestyle-Related Behavior Adaptation of During COVID-19 Pandemic" into Turkish was carried out to examine its reliability and validity in the Turkish sample.
Material and Methods: The study was conducted through an online questionnaire with a total of 160 people, 58.8 % of whom were women, between the ages of 18-65 years (31.24±11.35 years). The relevant validity and reliability tests were conducted for the Turkish adaptation of the translated questionnaire.
Results: In the study, it was determined that the sample size (KMO=0.812) and the items were sufficient for factor analysis ($\chi 2$= 819.879; $p<0.01$). The results of the explanatory factor analysis explained 68,239% of the total variability of the questionnaire and were accepted as 4 dimensions. According to the results of the confirmatory factor analysis, it was determined that the structural equation model of the scale was significant at p=0.000, and in addition, it was related to the 13 items that make up the scale and the four-factor questionnaire structure. When the goodness of fit index of the questionnaire was evaluated, it was found that it had acceptable fit with RMSEA 0.080; It has been found that it is in perfect agreement with $\chi 2$ 2.011. Factor loads of all items were determined to be between 0.647 and 0.828. The Cronbach's Alpha coefficient of the questionnaire was found to be 0.866.
Conclusion: As a result of the validity and reliability tests for the Turkish version of the questionnaire, it has been revealed that it is a valid and reliable measurement tool that can be used in health institutions.
Keywords: *Lifestyle, diet, COVID-19, Pandemic*

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INTRODUCTION

Coronavirus Disease (COVID-19) has spread all over the world within 3 months after being detected in China (Wuhan) in December 2019. In Turkey, it caused a pandemic that was officially declared on March 11, 2020 (Leszczak et al., 2022). This epidemic has spread all over the world, causing radical lifestyle changes, and has been one of the common and life-changing events (González-Hijón et al., 2023). Quarantine practices, routine changes, uncertainties, and stress situations caused by the pandemicaffect the physical and mental health of individuals, worsen sleep quality, increase the time spent in front of the screen, decrease the amount of physical activity, and cause more energy intake (Cancello et al., 2020; González-Hijón et al., 2023; Martínez-de-Quel et al., 2021). On the other hand, it was stated that it can motivate people to adopt a healthier lifestyle (such as nutrition, sleep, stress management, and physical activity) (Cancello et al., 2020; Kaufman-Shriqui et al., 2022). In addition, hypophagia or hyperphagia and overeating can occur due to acute or chronic stress, both of which can cause significant body weight changes (Sidor & Rzymski, 2020).

It is known that a healthy lifestyle strengthens the

immune system, reduces the risk of respiratory tract infections, and thus is effective in preventing many chronic conditions caused by the epidemic. In addition, it has been emphasized that regular physical activity increases the effectiveness of vaccines and may be beneficial for anxiety and depression. In addition, a healthy lifestyle is very important both in the pandemic process and in reducing the risk of all chronic diseases that may occur in the future (Cancello et al., 2020; Medrano et al., 2021). Therefore, during the pandemic, healthy lifestyle advice has been given, emphasizing the importance of adequate sleep and physical activity, healthy nutrition and stress management, as well as appropriate hygiene and social isolation measures (Hu et al. 2020; Van der Werf et al., 2021).

It is of great importance to examine the impact of COVID-19 on lifestyle behaviors and develop new strategies, as the effects of Pandemic still continue and the possibility of new variants is foreseen today (Kumari et al., 2020; Shimpo et al., 2021). At this point, Kumari et al developed a questionnaire that can assess all major aspects of lifestyle-related behaviors during the COVID-19 pandemic in 2020 (Kumari et al., 2020). Therefore, the aim of this study is to adapt the short questionnaire developed to evaluate changes in lifestyle-related behaviors during the COVID-19 pandemic into Turkish, to evaluate its validity and reliability, and to emphasize the importance of adopting a healthy lifestyle while the pandemic continues.

MATERIAL and METHODS

Permission was obtained from the authors to use the original version of this questionnaire, and the standard translation-back translation method was used for the translation of the questionnaire (Hançer, 2003). After the language equivalence was achieved, the opinion of a group of 10 experts in the relevant field was sought to ensure the content validity of the scale. Lawshe Method was used to collect expert opinions (Yeşilyurt & Çapraz, 2018).

Purpose and Type of the Study

In this research, the translation of ''A Short Questionnaire to Assess Changes in Lifestyle-Related Behavior Adaptation of During COVID-19 Pandemic'' into Turkish was conducted to assess its reliability and validity in the Turkish sample.

Sampling and Participant

A pilot study was conducted with 30 people to evaluate whether the translated questionnaire was understandable. It was determined that there was no problem in understanding the questionnaire and the data obtained from the pilot study were also included in this study. In validity and reliability studies, it is recommended that the sample size is at least 5 times or 10 times the number of variables used in the research (Bryman & Cramer, 2001). 160 people aged 18 and 65, living in Turkey, speaking Turkish, literate, and who voluntarily agreed to participate in the study were included in this study.

Data Collection Tools

The data obtained were collected using an online questionnaire. The relevant survey was created via the Google online survey platform and distributed to the participants via WhatsApp™ or e-mail. Body mass index (BMI) was calculated using self-reported body weights and heights of the participants.

A Short Questionnaire to Assess Changes in Lifestyle-Related Behavior Adaptation of During COVID- 19 Pandemic

This questionnaire includes 20 Likert-type questions developed by Kumari et al. with the Indian population in 2020. Questionnaire; It was developed through a standard methodology that included expert assessment, pretesting and validation, and then construct validity and content validity were analyzed. A cross-sectional questionnaire was administered to 103 literate participants aged 18 years and older to validate the questionnaire, which used a 5-point Likert scale as an answer option. Exploratory factor analysis was performed to determine construct validity. Cronbach's alpha value was calculated to test the internal consistency of the entire questionnaire. The Cronbach's Alpha coefficient of the questionnaire is 0.72 (Kumari et al., 2020).

Statistical Analysis

The data obtained in the research collected by the tests were transferred to the SPSS 25.0 (Statistical Package for Social Sciences, version 25) program, and then statistical analyzes of the data were made using this program. DFA (Confirmatory Factor Analysis) was conducted using the AMOS 21 program. Normality analyzes were evaluated with kurtosis and skewness values. Evaluation of the difference between the mean scores according to the demographic characteristics of the participants, independent sample t-test in two-category groups; F test when there are more than two categories; Bonferroni was used for multiple comparison test. The relationship between continuous variables was evaluated with Pearson correlation analysis. Values

with p< 0.05 were considered statistically significant. The Kaiser-Meyer-Olkin (KMO) test was applied to assess the sample size's suitability for factorization, followed by the Bartlett Sphericity test. Exploratory factor analysis using Principal Component Analysis and Varimax rotation methods was then performed. To confirm the construct validity, confirmatory factor analysis was employed. Discrimination power of items was evaluated through Independent group t-tests and item-total correlations. Distinctiveness of items was determined by ranking the questionnaire scores and comparing the average scores of the lower 27% and upper 27% groups using t-tests. Reliability was assessed using Cronbach Alpha and the halving method. Additionally, mean explained variance (AVE) and composite reliability (CR) values were calculated for each factor separately.

Ethical Approval

For this study, "Ethics Committee Approval" dated 01.12.2021 and numbered 186 was obtained from Haliç University Non-Invasive Clinical Research Ethics Committee. Data collection stages in line with the principles of the Declaration of Helsinki has been carried out.

RESULTS

In this study, which included 160 adults between the ages of 18-65 years, 58.8% of the participants were female and 60.6% were single. The mean age of the participants was 31.24±11.35 years, and the mean BMI was 25.05±4.58 kg/m^2. The descriptive information of the participants is given in Table 1. The Lawshe Method, which was used to collect expert opinions, was applied for each item to ensure the language equivalence and cultural equality of the short questionnaire used in the study. Accordingly, it means "1-Not applicable", "2-Item needs to be corrected", and "3-Appropriate". As a result of the opinions obtained, the content validity ratios (CVR) were calculated for the entire questionnaire. The criterion value for CVR was accepted as 0.6 for ten specialists. The content validity of the items was ensured, since the average of all the questionnaire items were 0.82 and 0.91, respectively, regarding their relevance and intelligibility to Turkish society. Item-total score correlation values were found to be between 0.376 and 0.659. As a result, the answers given are consistent and the study can be continued. In addition, the general internal consistency coefficient of the questionnaire was calculated as 0.904, and it was found to be reliable (Table 2).

The Kaiser-Meyer-Olkin (KMO) value was determined to be 0.812. Thus, the sample size and items were “adequate” for factor analysis. Explanatory factor analysis was performed, the sizing step was repeated, and items that were not significant when combined were removed from the analysis. As a result, the related questionnaire was accepted as 4-dimensional, and the factor pattern was found acceptable. The questionnaire, adapted according to the exploratory factor analysis results, explains 68.239% of the total variability. In addition, the first factor explains 27.838% of the total variability, the second factor explains 15.036% of the total variability, the third factor explains 13.421% and the fourth factor explains 11.944% (Table 3).

The structural equation model of the scale was significant, and it was related to the four-factor structure of the 13 items and the questionnaire. The model has been improved. According to the results of the first level multi-factor analysis, it was found that it showed acceptable agreement with RMSEA 0.080 and excellent agreement with χ2 (Cmin/df) 2.011. Thus, the existence of construct validity of the scale was determined (Table 4).

It is seen that the factor load value of all items is above 0.30. It was determined that all items had values between 0.647 and 0.828 according to their factor loads (Table 5, Figure 1).

The minimum value for the adequacy of item-total test correlation was determined as 0.30, and there is no item below this value. The item-total test correlation values of these items vary between 0.381 and 0.744, and the items are also related to each other. The mean discrimination scores of the lower 27% and upper 27% groups were compared with the independent group, and it was seen that there was a difference between the group mean scores (Table 6). Reliability analysis is performed to determine the consistency of the statements in the scales with each other and the scale of all statements on the same subject (Ercan & İsmet, 2004). When the results were examined, it was determined that this questionnaire was a very reliable questionnaire with a Cronbach Alpha value of 0.866. In addition, the reliability of the subscale was found to be in the range of 0.640-0.877 (Table 7).

According to the Two-Half Confidence, the questionnaire was found to be reliable. The results are shared in Table 8.

The reliability of the model was also analyzed according to the mean explained variance (MEV) and composite reliability (CR) values for each factor. In the four-factor structure measuring lifestyle change, MEV and CR values were at the desired level. Thus, it can be decided whether this factor should be removed from the model by looking at the fit and

discriminant validity analyzes. The validity of the measurement model was tested in terms of compatibility and discriminant validity. Concordance validity shows the correlation between the variables constituting the structure and this correlation is expected to be high. In addition, for concordance validity, the MEV value of each structure should be greater than 0.5, and the CR value calculated for each structure should be greater than the MEV value. It was seen that the relevant limit values were provided for the measurement tool. Therefore, it was determined that concordance and discriminant validity were achieved (Table 9).

Table 1: Descriptive Information of Participants (n=160)

			$\bar{X}$±SD
Age (years)			31.24±11.35
Weight (kg)			73.00±16.64
Height (m)			170.24±10.22
BMI (kg/m²)			25.05±4.58
		n	**%**
Gender	Female	94	58.8
	Male	66	41.2
Marital status	Married	62	38.8
	Single	98	61.2
Educational status	Primary school	6	3.75
	Middle school	6	3.75
	High school	20	12.5
	College	12	7.5
	University	90	56.25
	Postgraduate	26	16.25
COVID-19 status	Yes	65	40.6
	No	95	59.4

BMI: Body Mass Index

Table 2: Reliability Analysis Results of the Study

	Average if item is deleted	Variance if item is deleted	Item-total score correlation	Cronbach Alpha if item is deleted
M1	48,8812	115,741	0.376	0.904
M2	49,2500	112,755	0.603	0.898
M3	49,0875	113,200	0.593	0.898
M4	49,1875	115,172	0.499	0.901
M5	49,1312	111,851	0.634	0.897
M6	49,1188	109,967	0.590	0.898
M7	48.8938	111,328	0.553	0.899
M8	49,1250	110,022	0.659	0.896
M9	49.2375	112,811	0.584	0.898
M10	49.2875	112,055	0.579	0.898
M11	49,2750	112,792	0.559	0.899
M12	49,1750	112,862	0.595	0.898
M13	49.3313	113,103	0.569	0.899
M14	49.2562	112,003	0.591	0.898
M15	49,0000	114,767	0.457	0.902
M16	49,2125	113,628	0.539	0.900
M17	49,5938	114,293	0.446	0.902
M18	49.2562	115,311	0.390	0.904
M19	48,8562	114,086	0.443	0.902
M20	49,4500	111,381	0.548	0.899
Overall Cronbach Alpha Value of the Questionnaire=0.904				

Table 3: Final Explanatory Factor Analysis of the Questionnaire

	Factors			
	Eating habits Bottom Size	**Daily activity Bottom Size**	**Healthy Nutrition Information Bottom Size**	**Sleep patterns Bottom Size**
M3	0.799			
M6	0.774			
M8	0.758			
M7	0.720			
M10	0.717			
M2	0.715			
M16		0.750		
M15		0.696		
M17		0.554		
M14			0.834	
M13			0.789	
M19				0.835
M18				0.824
Eigenvalue	4,994	1,502	1,182	1,049
Rate of Variance Explained	24,905	15,940	14,481	11,802
KMO =0.812 X2(78) =819.879; Bartlett Test of Sphericity (p) = 0.000				
Total Explained Variance =67,129				

Table 4: Confirmatory Factor Analysis Results of the Questionnaire

Index	**Perfect Fit Criterion**	**Acceptable Compliance Criteria**	**Post Modification**
X^2/SD	0≤χ2 / df≤3	3≤χ2 / df≤5	2,011
RMSEA	0.00 ≤ RMSEA ≤0.05	0.05≤ RMSEA ≤ 0,08	0.080
SRMR	0.00 ≤ SRMR ≤0.05	0.05≤ SRMR ≤ 0,08	0.052
CFI	0.95≤CFI	0.85≤CFI	0.931
GFI	0.90≤GFI	0.85≤GFI	0.902
AGFI	0.90≤AGFI	0.85≤AGFI	0.841
IFI	0.90 ≤ IFI ≤1.00	0.80≤ IFI	0.933
TLI	0.90≤TLI	0.80≤TLI	0.904
NI	0.90≤NFI	0.80≤NFI	0.875

Chi-square/ Degrees of Freedom (X^2/SD)
Root Mean Square Error of Approximation (RMSEA)
Comparative Fit Index (CFI)
NNFI (TLI): Unnormed Compliance Index
Goodness of Fit Index (GFI): Goodness of Fit Index
Adjusted Googness of Fit Index (AGFI)

Table 5: Confirmatory Factor Analysis Factor Loads (First Level)

	Standardized factor load	**Unstandardized factor load**	**SE**	**CR**	**p**
M2	0.672	1,000			<0.001
M3	0.647	0.942	0.107	8,767	<0.001
M6	0.748	1,400	0.174	8,027	<0.001
M7	0.686	1,231	0.165	7,441	<0.001
M8	0.828	1,402	0.162	8,663	<0.001
M10	0.745	1,216	0.152	8,023	<0.001
M13	0.761	1,000			<0.001
M14	0.807	1,121	0.178	6,311	<0.001
M15	0.626	1,000			<0.001
M16	0.717	1,105	0.182	6,056	<0.001
M17	0.640	1,092	0.207	5,285	<0.001
M18	0.730	1,000			<0.001
M19	0.668	0.929	0.213	4,364	<0.001

SE: Standar Error, CR: Z test değeri

Table 6: Item Analysis Results Regarding the Questionnaire Items

	r	t (< 27% and > 27%)	p value (< 27% and > 27%)
F1: Feeding Habit			
M2	0.632	10,492	0,000*
M3	0.648	8,456	0,000*
M6	0.740	16,876	0,000*
M7	0.674	14,889	0,000*
M8	0.744	13,977	0,000*
M10	0.667	14,075	0,000*
F2:Healthy Nutrition Information			
M13	0.614	16,473	0,000*
M14	0.614	18,951	0,000*
F3:Daily Activity			
M15	0.403	11,465	0,000*
M16	0.580	13,050	0,000*
M17	0.381	15,174	0,000*
F4: Sleep Pattern			
M18	0.487	21,826	0,000*
M19	0.487	19,035	0,000*

*n = 160, ** n1 = n2 =43;*
*r = Item Total Score Correlation * Significant values for p < 0.05*

Table 7: Reliability Analysis Results of the Questionnaire

Questionnaire and its Sub-Dimensions	Cronbach Alpha
Survey General	0.866
Eating habits	0.877
Healthy Eating Interest	0.760
Daily activity	0.640
Sleep patterns	0.655

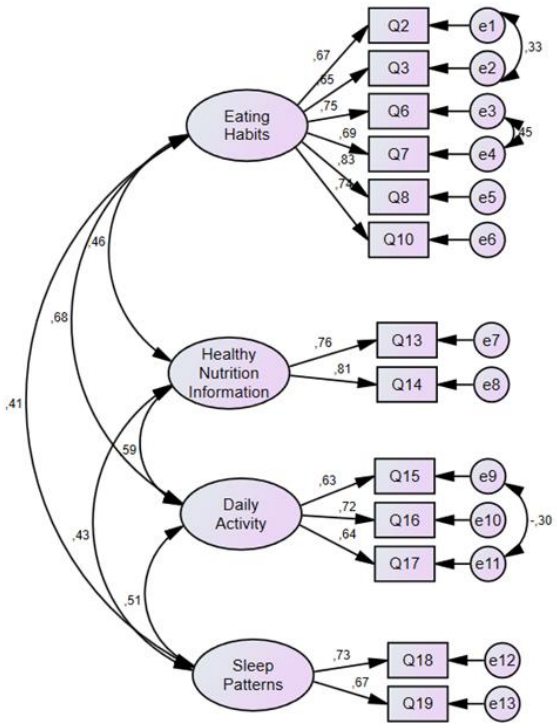

Figure 1: First Level Multi-Factor Model Confirmatory Factor Analysis of the Questionnaire (Standardized)

Table 8: Two-Half Confidence

Cronbach's Alpha	Part one: M2, M6, M8, M13, M15, M17, M19	0.757
	Second Section M3, M7, M10, M14, M16, M18	0.710
Correlation between two halves		0.884
Spearman -Brown coefficient equal		0.938
Spearman -Brown coefficient not equal		0.939
Guttman Split-Half coefficient		0.931

Table 9: MEV and CR Value of the Questionnaire

		1	2	3	4	AVE	AVE square root	CR
1.	NutritionHabit	1				0.52	0.72	0.87
2.	Healthy Nutrition Information	0.453 **	1			0.62	0.79	0.76
3.	Daily activity	0.582 **	0.538 **	1		0.5	0.71	0.72
4.	Sleep patterns	0.528 **	0.380 **	0.547 **	1	0.5	0.71	0.70

Evaluation of the Short Questionnaire Developed to Evaluate Changes in Lifestyle and Behaviors During the COVİD-19 Pandemic

- Items 1, 3, 4, 5, 6 and 11 are scored as follows:
  2 = Slightly decreased, 1 = Slightly decreased, 0 = Slightly similar, -1 = Slightly increased, -2 = Substantially increased.
- Items 7, 8, 9, 10 and 13 are scored as follows:
  2 = Slightly increased, 1 = Slightly increased, 0 = Slightly similar, -1 = Slightly decreased, -2 = Slightly decreased.
- 2. ** , 12. *** are scored as follows:

0 = Completely similar-1 = Slightly increased/decreased-2 = Significantly increased/decreased

** Item 2 is scored assuming the person ate normal meal and snack portions prior to the COVID pandemic.

*** Item 12 is scored assuming that the person got enough sleep of 6-8 hours before the pandemic.

- As the total score obtained by the individuals from the questionnaire increases, the positive effect of COVID-19 on the lifestyle-related behaviors of the individual increases.
- The negative impact of COVID-19 on an individual's lifestyle-related behaviors increases as the total score obtained by individuals from the questionnaire decreases.
- If the total score obtained by the individuals from the questionnaire is 0, COVID-19 did not have an effect on the individual's lifestyle-related behaviors.

DISCUSSION

The restrictions imposed due to the pandemic have seriously disrupted people's daily routines. In the early stages of the world, quarantine led to fundamental changes in normal food-related behavior and diet (Kumari et al., 2020). In addition, all areas (gyms, parks, playgrounds, etc.) where individuals can socialize and maintain a healthy lifestyle have been closed to prevent the spread of COVID-19. Many types of physical activity have become limited. In addition, deviating from a healthy lifestyle worsens the course of chronic diseases (Ammar et al., 2020). As several variants of the COVID-19 outbreak still exist, and new ones are expected, it is increasingly important to discover how significant the impact of this epidemic and related restrictions on people's eating habits and lifestyle-related behaviors, including their physical health. There is no valid and reliable comprehensive measurement tool developed or adapted in Turkey to evaluate behavioral changes in lifestyle due to the COVID-19 pandemic. In this study, Turkish validity and reliability analyses of "A Short Questionnaire To Assess Changes In Lifestyle-Related Behavior During COVID-19 Pandemic" were conducted to determine these changes. In the study, the validity and reliability analyzes of the questionnaire were made. It was determined that the sample size was sufficient for factor analysis and that there was sufficient correlation between the items. The sizing step was repeated, and then it was determined that the factor design was acceptable in the 4-dimensional questionnaire. According to the confirmatory factor analysis, it was determined that the result of the structural equation model of the scale was significant and it was related to the 13-item and 4-

factor structure of the questionnaire, and the model was improved. When the goodness of fit indexes of the related scale are examined; acceptable fit and perfect fit. According to all these results, the existence of construct validity of the relevant scale was determined. The questionnaire was found to be quite reliable with a Cronbach Alpha of 0.866. In addition, it was seen that the reliability of the sub-dimension was in the range of 0.640-0.877 and the questionnaire was reliable. Finally, the reliability of the measurement model was tested by looking at the mean explained variance (MEV) and composite reliability (CR) values of each factor separately. It has been determined that concurrency and discriminant validity are provided. In summary, our results support good internal consistency, content validity, face validity, and construct validity of this questionnaire. The questionnaire also has a structure that is short, clear, easy to understand, self-administered and takes no more than 3-5 minutes to administer. Although there is no measurement tool in Turkey to evaluate lifestyle behavior changes during the COVID-19 pandemic process, there are studies conducted in Poland, Italy and Saudi Arabia (Hammouri et al., 2022; Sidor & Rzymski, 2020). In a study conducted in Jordan, the Cronbach alpha values of this questionnaire were shown to be over 0.7 (Hammouri et al., 2022). However, the self-developed questionnaire used on the Polish population assesses people's dietary choices and habits only during the COVID-19 outbreak (Sidor & Rzymski, 2020).

CONCLUSION

As a result, it has been shown that the related questionnaire is a valid and reliable measurement tool in the Turkish sample. This measurement tool It consists of 13 items covering information needed to assess nutrition, physical activity, and sleep. Maintaining a healthy lifestyle is vital in reducing the risk of chronic diseases that may arise both during the pandemic and in the future. A scientifically validated assessment of individuals' lifestyle changes during the COVID-19 period can be examined with this questionnaire. It is hoped that this will provide valuable information for public health policies and interventions aimed at maintaining good mental health and a healthy lifestyle during and after the COVID-19 pandemic. In addition, this survey study can be effective in determining how lifestyle behaviors of individuals and communities may be affected during and after any quarantine or epidemic. It can be effective in understanding the duties of relevant health professionals, including nutritionists and dietitians, in pandemic situations such as COVID-19 that are currently ongoing in the world and may be possible in the future.

LIMITATIONS

According to the results of the study, this questionnaire is a reliable measurement tool. However, the study has some limitations. First, a self-reported questionnaire was used for the study. In future research, clearer statements can be obtained with the face-to-face interview technique. Secondly, geographical constraints necessitate the planning of the study by focusing on national-based or different cohort groups and increasing the number of samples in the future.

Conflict of Interest

All authors declared no conflict in the study.

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Investigation of The Accuracy of Palpation of Physical Therapy Students to Different Anatomical Landmarks**

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ABSTRACT:
Purpose: Surface anatomy plays a crucial role in physical therapy education as it enables the examination of subcutaneous structures through palpation. This study aims to investigate the accuracy of palpation on landmarks among physical therapy students (PT).
Material and Methods: This cross-sectional, observational study evaluated the accuracy of palpation on anatomical landmarks. The researchers specified 21 landmarks for palpation assessment. Each landmark was scored on a scale of 0 to 3, and the Landmark Total Palpation Score (L_t) was calculated based on the scores of all 21 landmarks. A higher score indicated poorer accuracy in identifying anatomical landmarks. A total of 88 individuals included in this study. Intrarater reliability was examined with weighted kappa statistics.
Results: The participants' L_t scores had a mean of 10.09 ± 9.66, with a standard deviation. The weighted kappa of each landmark ranged from 0.89 to 1.0.
Conclusion: The results of this study showed that there was a good level anatomical landmark identification among PT students.
Keywords: *Physical Therapy Education; Surface Anatomy; Landmark; Palpation, Physiotherapy*

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INTRODUCTION

Anatomy has long held a central position and served as a foundational element in health education throughout history (Louw et al., 2009). Traditional anatomy lectures have traditionally followed theoretical and practical models, including the use of plastic models and cadaver dissection. However, with the advancements in visualization and simulation techniques, as well as the internet, a new and modern educational approach has emerged (Tam et al., 2009; Lim et al., 2016). These techniques have significantly improved anatomy education on an international scale (Sugand et al., 2010).

Surface anatomy is considered one of the most crucial methods contributing to an ideal anatomy education (Sugand et al., 2010). The study of surface anatomy provides a deeper understanding of the static anatomy of cadavers by enabling students to observe the movement and functionality of phenotypical structures, particularly those related to the musculoskeletal system, in living individuals. Surface anatomy allows for the evaluation of subcutaneous structures through techniques such as percussion, auscultation, and frequently, palpation (Bergman et al., 2013). Physical therapists often rely on palpation to assess superficial anatomy. Knowledge of surface anatomy in physiotherapists ensures accurate patient assessment and treatment.

Additionally, proficient clinical assessment is a vital component of effective decision-making (Smith et al., 2008).

The objective of this study was to investigate the accuracy of palpation on different anatomical landmarks among physical therapy (PT) students. These landmarks are crucial for precise clinical diagnosis and are necessary for palpation-guided therapeutic practices.

MATERIAL and METHODS

Sampling and participant

This study was designed as a cross-sectional and observational study in accordance with the Guidelines for Reporting Reliability and Agreement Studies (Kottner et al., 2011). This study was conducted at Muğla Sıtkı Koçman University and Gazi University in Turkey during the 2017-2018 academic year, involving 88 students. Both Physiotherapy departments offer an anatomy course in the first year, while rehabilitation courses and clinical internships are integrated into the curriculum in subsequent years. The inclusion criteria for participants were as follows: being a final-year student in the Department of Physical Therapy and Rehabilitation, successfully completing summer trainings in the second and third years, currently undergoing clinical training in the final year, and voluntarily agreeing to participate in the study.

According to the findings obtained from the research, the effect size was found to be 0.36 based on the palpation total score when post hoc power analysis was performed using the G-power program. The power analysis, based on a significance level of 0.05, a sample size of 88, and an effect size of 0.36, yielded a research power of 94%, which was considered sufficient.

Procedure

After collecting the demographic characteristics of the 88 students, including age, gender, Body Mass Index (BMI), and university grade-point average, the accuracy of palpation on landmarks was evaluated. Each student was assigned a number ranging from 1 to 88, and pairs of students were randomly created by drawing numbers. A total of 44 pairs of students were formed, with each pair consisting of a student who performed palpation and their partner as the recipient. The accuracy of palpation was assessed without providing any feedback to the students regarding their assessments. To evaluate intra-rater reliability, the same evaluator re-evaluated 30 students (15 pairs) on the 5th day after the initial assessment. The purpose of this intra-rater reliability evaluation was to measure the consistency of the rater's scores for the students and ensure self-consistency in the assessment process.

Data Collection Tools

Palpation on anatomical landmarks: To assess the accuracy of palpation on anatomical landmarks, the researchers selected twenty-one commonly used landmark points, which are taught in basic undergraduate courses. These landmark points include: C7 spinous process, mastoid, occiput, acromion, biceps long tendon, medial condyle of humerus, styloid process of radius, anterior superior iliac spine, posterior superior iliac spine, iliac crest, xiphoid process, greater trochanter, medial condyle of femur, tibial tubercle, head of fibula, medial malleolus, navicular tuberosity, head of the first metatarsal, head of the third metacarpal, greater tubercle of humerus, and jugular notch. Trainee physiotherapists were instructed to perform palpation on these landmark points on their peers. To assess each of this palpation, we used a qualitative grading system that ranged from 0 =excellent to 3 = incorrect (Fernández-Lao et al, 2016). The higher points were given as the palpation moved further away from the landmarks. For each participant, a Landmark Total Palpation Score (L_t) was calculated, ranging from 0 to 63.

Statistical Analysis

The data analysis was carried out using SPSS version 22 (SPSS Inc.). Descriptive statistics were employed to present the demographic characteristics of the participants. Spearman correlation analysis was conducted to examine the relationship between age, BMI, and Lt. The Mann-Whitney U test was utilized to assess differences between gender and Lt. For analyzing the differences between university grade-point average and Lt, the Kruskal-Wallis's test and post hoc analyses were conducted. Intra-rater

reliability was determined using Kappa coefficients, as anatomical landmarks scoring is a numerical grading system. The classification system proposed by Landis and Koch (Landis et al., 1977) was employed to determine the level of reliability (poor: kappa smaller than zero; slight: zero to 0.20; fair: 0.21 to 0.40; moderate: 0.41 to 0.60; substantial: 0.61 to 0.80; almost perfect: 0.81 to 1.00).

Ethical Approval

This study obtained ethical approval from the Ethical Committee of Gazi University. Prior to participation, all participants were fully informed about the study objectives and procedures, and they provided their informed consent by signing consent forms. The assessments were conducted by the first author, who was also responsible for overseeing the clinical internship of the students.

RESULTS

One hundred and twenty students met the inclusion criteria, of which eighty-eight voluntarily agreed to participate in the study. Table 1 presents the descriptive characteristics of the participants. The mean Landmark Total Palpation Score (L_t) was found to be 10.09 ± 9.66, indicating the overall accuracy of palpation. The palpation scores for each landmark are provided in Table 2.

Table 1: Demographic characteristics of participants (n=88)

Total (n=88)	**Mean ± Sd**
Age (year)	22.73 ± 1.49
BMI (kg/m²)	22.57 ± 3.41
	n (%)
Gender	
Female	56 (63.6)
Male	32 (36.3)
Grade-point average	
1.00-2.00	3 (3.4)
2.00-2.50	34 (38.6)
2.50-3.00	28 (31.8)
3.00-4.00	23 (26.1)

BMI: Body Mass Index

Table 2. The palpation scores for each landmark

Landmarks	**Asessment_1**	**Asessment_2**
C7 processus spinosus	0.01±0.10	0.01±0.10
Mastoid	0.72±1.51	0.65±1.55
Occiput	0.14±0.61	0.15±0.63
Acromion	1.42±1.59	1.05±1.12
Biceps long tendon	1.25±1.58	1.25±1.58
Medial condyle of humerus	0.10±0.71	0.00±0.00
Radius styloid process	0.21±0.85	0.30±0.60
Spina iliaca anterior süperior	0.45±0.42	0.10±0.50
Spina iliaca posterior süperior	0.53±1.10	0.45±1.10
Crista iliaca	0.53±1.33	0.70±1.07
Processus xiphoideus	0.77±1.54	0.72±1.55
Trochanter major	0.24±0.71	0.30±0.65
Medial condyle of femur	0.09±0.35	0.09±0.35
Tibial tubercle	0.38±0.97	0.87±0.65
Head of fibula	1.13±1.68	1.50±1.25
Medial malleol	0.00±0.00	0.00±0.00
Tubercle of navicula	0.81±1.57	0.80±1.55
Head of 1. Metatars	0.05±0.30	0.00±0.00
Head of 3. Metacarp	0.01±0.10	0.00±0.00
Greater tubercle of humerus	1.12±1.46	1.05±1.55
Incisura jugularis	0.42±1.39	0.32±1.39

The study participants had a mean BMI of 22.57 ± 3.41, indicating a relatively homogeneous group in terms of body mass index (BMI). The correlation analysis did not find a statistically significant correlation between BMI and Lt ($p>0.05$). Similarly, there was no statistically significant correlation observed between age and Lt ($p>0.05$). The Mann-Whitney U test did not show any statistically significant differences between gender and Lt ($p>0.05$), but the Kruskal-Wallis's test revealed statistically significant differences between grade-point average and Lt ($p<0.05$). The students with

higher grade-point averages demonstrated better palpation skills compared to others. The weighted kappa for each landmark ranged from 0.89 to 1.0.

DISCUSSION

Anatomical landmark palpation skills have been shown to be a crucial aspect of manual therapy (Salvia et al., 2009). However, there is a lack of comprehensive studies evaluating the knowledge of students or clinicians in this area. This study aimed to assess the accuracy of palpation on 21 different landmarks among physiotherapy students from two different universities using an objective and simple method. The results revealed that students had a good ability to determine surface anatomy through palpation.

Previous studies have provided conflicting findings regarding the impact of BMI on the palpation of spinal landmarks. Some studies indicated that BMI negatively affects the accuracy of surface anatomy palpation methods in obese individuals (Harlick et al., 2007; Robinson et al., 2009). Excessive subcutaneous fat in obese patients can interfere with the accuracy of palpation based on surface anatomy. However, in some studies, similar to the present study, no significant difference was observed between BMI and palpation skill (Shin et al., 2011; Kawchuk et al., 2011). One limitation of this study is that the majority of students had normal or overweight BMI, with only one student classified as "obese" according to the World Health Organization's BMI classification. This may have contributed to the higher accuracy of palpation in this study. Therefore, further comprehensive studies are needed to better understand the relationship between BMI and palpation accuracy. Such studies can provide valuable insights into the reliability and effectiveness of palpation methods, especially in obese individuals, which can significantly impact accurate diagnoses and treatment planning.

Among the 21 landmarks assessed in this study, the best palpation scores were achieved for the medial malleolus, C7 spinous process, 3rd metacarpal head, and 1st metatarsal head. On the other hand, the worst palpation scores were obtained for the long tendon of the biceps, fibular head, and acromion. Consistent with the current study, McDevitt et al.'s (2020) study demonstrated that the accuracy of biceps long tendon palpation among physiotherapists is low (McDevitt et al., 2020). These findings suggest that additional identification methods may be necessary for more effective determination of these landmarks, in addition to palpation.

Reliability is crucial for scientific measurement and assessment in medicine. In this study, we assessed the interrater reliability of each landmark using weighted kappa statistics, which measure the agreement among assessments adjusted for the amount of agreement expected by chance and the magnitude of disagreements. According to the criteria by Fleiss (Fleiss, 1981), our study demonstrated perfect intrarater reliability. However, it is essential to acknowledge that the validity of the assessment method was not investigated in this study. Validity refers to how well a measurement accurately captures the intended construct or phenomenon. In the context of palpation evaluations, the validity of the method should be tested against gold-standard methods such as ultrasonography (US) or magnetic resonance imaging (MRI) (Mieritz et al., 2016; Rho et al., 2014). The lack of investigation into the validity of the palpation assessment method is considered a notable limitation of this study.

Previous studies have suggested that incorporating US into musculoskeletal palpation can enhance learning and improve palpation techniques (Walrod et al., 2018). However, utilizing ultrasound for educational purposes may not be practical due to logistical and training constraints, as physiotherapists may not possess extensive training in the use of imaging methods. Therefore, despite the potential benefits of incorporating imaging methods like ultrasound, palpation remains the most commonly utilized, quick, and practical evaluation method for diagnosing and treating patients, particularly for physiotherapists. It is crucial for future studies to explore the validity aspects of palpation assessments and compare them with gold-standard imaging techniques to further enhance the reliability and accuracy of the evaluation method.

Conclusion

As a result of this study, it was concluded that the 21-reference point evaluation method was reliable for determining anatomical landmarks by palpation in physiotherapy students, and that physiotherapy students had a good level of palpation ability.

Conflict of Interest

No conflict of interest

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