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Aims and Scope

Health Sciences Quarterly (Health Sci. Q.) is an open-access journal that publishes original research papers, case reports, and reviews, clinical studies covering a wide range of subjects in life sciences and medicine as well as clinical and experimental investigations only in English.

Researchers in health sciences will find much of great use and interest in the Health Sci. Q.

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ORIGINAL ARTICLE

The level of knowledge and awareness of teachers in the province of Kayseri for type 1 diabetes mellitus, the adequacy of schools in diabetes mellitus management

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Abstract

Type 1 Diabetes Mellitus (T1DM) is an important chronic health problem of childhood. Cooperation of parents and teachers is necessary in diabetes management. In our cross-sectional study, a 3-part questionnaire evaluating the educational status of teachers for T1DM was used. Questions consisting of 4 factors were asked about the level of knowledge, awareness, living with diabetes, and school life with diabetes. In scoring the answers given to the questions in the first part, each correct answer was recorded as +1 point, each incorrect answer as -1 point, and 'I have no idea' as 0 points. The total score ranged from -21 to +21 points. Those who scored 11 points or more were considered to have a sufficient level of knowledge and awareness about T1DM. The validity of the first part of the scale, *KMO* and *Bartlett's* test score, was found to be 0.94. The reliability of the first part of the scale, *Cronbach's* alpha value, was 0.91. The mean score of the first part of the scale was 9.3±5.1, and range was between -3 to 19 points. In our study, the number of those who scored 11 points or more in the questions measuring the level of knowledge and awareness about diabetes were 268 (46.4%). We observed that the level of knowledge and awareness about diabetes in schools in our province is not sufficient.

Keywords: Diabetes mellitus, knowledge, school, teacher, type 1 diabetes

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Introduction

Type 1 Diabetes Mellitus (T1DM) is an important chronic health problem of childhood. Many countries around the world have clear legal guidelines to support chronically ill children, especially diabetics, in the education system [1]. In a study published in Türkiye in 2017, the national prevalence and incidence of T1DM were found to be 0.75/1000 and 108/100.000, respectively [2]. Support from family, doctor, nurse, dietitian, and psychologist is of great importance in childhood diabetes management. Depending on the age, some responsibilities can be given to the child. With the school age, the time spent in the home environment decreases, and a large part of the day is spent at school. Mostly parents, sometimes school nurses and teachers support the child who continues his or her diabetes management and daily life with blood sugar monitoring, insulin administration, nutrition, and sports activities. 'Diabetes Prevention and Control Program in Türkiye' is a program that has been carried out since 2010 to prevent the development of type 2 diabetes mellitus (T2DM), early detection of T1DM and T2DM, and improve diabetes care. 'Childhood Diabetes Control Program' is included as a separate subject in this program. As part of this program, with the cooperation of the Ministry of Health and the Ministry of National Education and with the contributions of the Turkish Pediatric Endocrinology and Diabetes Association, "Diabetes Program at School" was started and this program continues actively throughout Türkiye [3]. The main purposes of this program are to increase the level of knowledge and awareness about T1DM in schools and teachers, to provide early detection of diabetes mellitus, to improve diabetes management, to reduce the frequency of diabetic ketoacidosis complications, and to prevent the development of obesity by developing healthy eating attitudes. 'A guide to school exams for children with diabetes', 'Individualized Diabetes Management Plan' (DMP), and 'School Action Plan' were prepared and sent to schools. In October 2020, a directive was published by the Turkish Ministry of National Education and the duties and responsibilities of families, teachers, and nurses in schools were determined. Teachers were asked to attend the training and take part in diabetes management. In a study that audited the effectiveness of the "Diabetes Program at School" and evaluated the knowledge and attitude scores of teachers throughout Turkey, the lowest scores were found in Central Anatolia and Southeastern Anatolia regions, and it was determined that the level of knowledge and awareness of school staff about T1DM showed regional differences [4]. In our study, we evaluated the knowledge level and awareness of teachers in public and private schools operating under the Provincial Directorate of National Education in the province of our city in the Central Anatolian region, and the adequacy of the school equipment, with a scale consisting of 3 parts.

Materials and Methods

Study Design

The study was approved by the clinical research ethics committee of Kayseri City Training and Research Hospital (2022-607). Survey records were obtained online between 30 May and 30 June 2022. Research ethical principles were conducted in accordance with the Declaration of Helsinki. In our cross-sectional study, a 3-part questionnaire evaluating the educational status of teachers for T1DM was used. The scale consisted of 43 questions. In the first section, questions consisting of 4 factors were asked about the level of knowledge, awareness, living with diabetes, and school life with diabetes. The answers were determined as 'True', 'Wrong', and 'No idea'. In scoring the answers given to the questions in the first part, each correct answer was recorded as +1 point, each incorrect answer as -1 point, and 'I have no idea' as 0 points. The total score ranged from -21 to +21 points. Those who scored 11 points or more (those whose scores are above average) were considered to have a sufficient level of knowledge and awareness about T1DM. In the second part, multiple choice questions measuring the level of direct knowledge of the teachers about the treatments used in diabetes management were asked and the rate of choosing the correct answer from 4 options was evaluated. In the third part, questions were asked to measure the school's responsibilities and equipment adequacy for diabetes care. The

answers were determined as 'Yes', 'No', and 'No idea'.

The study was approved by the clinical research ethics committee. The date of approval is March 10, 2022, and the number is 607. The conditions of the Ministry of National Education for scientific research were fulfilled, and a questionnaire form was created to be answered electronically, with the approval of the Provincial Directorate of National Education and the Provincial Health Directorate. This survey was shared for around 20,700 teachers working in the province. As a random method, educators were asked to fill out the surveys on a voluntary basis. The participation rate in the survey was around 3%.

Statistical Analysis

The validity of the first part of the scale was evaluated by factor analysis and after the analysis, 2 statements were removed from the scale, and the final *KMO* and *Bartlett's* test score were found to be 0.94. It was statistically significant. (p<0.001). The questions in the scale were collected in 4 factors and the cumulative variance was 53.7%. The questions in the first part of the scale were also evaluated with reliability analysis. *Cronbach's* alpha value was 0.91. As such, the scale was found to be a valid and reliable scale. The answers given by the individuals to the questions in the second and third parts (categorical variables) are shown as numbers and percentages. According to the answers given to the questions in Table 3, the scores obtained by the participants in the first part were also compared by ANOVA analysis and Bonferroni as a *Post-Hoc* method. A p-value less than 0.05 was considered statistically significant.

Results

A total of 577 teachers, 320 (55.5%) female, and 257 (44.5%) male, participated in our study. The distribution of teachers by age range was as follows: 29 teachers of aged 20-29 (5%), 240 teachers of aged 30-39 (41.6%), 190 teachers of aged 40-49 (32.9%), 106 teachers of aged 50-59 (18.4%), and 12 teachers of aged over 60 (2.1%). The responses given to the statements evaluating the level of knowledge, awareness, daily life, and school life about diabetes were shown in Table 1. Statement 2 and Statement 9, which are among the items in this section, were excluded from the validity analysis due to their low factor loads. The mean score of the answers given to the questions in the first part of the scale was 9.3±5.1 and the range was between -3 and 19 points. In our study, the number of those who scored 11 points or more in the questions measuring the level of knowledge and awareness about diabetes was 268 (46.4%). Questions containing general information about T1DM treatment management are shown in Table 2.

The questions related to T1DM management and equipment adequacy at school are shown in Table 3. According to the answers given to the questions in Table 3, the scores obtained by the participants in the first part were also compared. The scores of those who answered ''Yes'' (first part score 11.5±4.6) to the question of whether there was anyone who had received education on diabetes at school were significantly higher than those who answered ''I have no idea'' (first part score 9±5.2; p= 0.001) and those who answered ''No'' (first part score 9.25±5.2; p= 0.008). The scores of those who answered ''Yes'' (first part score 10.6±5.0) to the question of whether there is a child with diabetes in the institution I work in/around me were significantly higher than those who answered ''I have no idea'' (first part score 8.2±5.5; p< 0.001) and those who answered ''No'' (first part score 9.4±4.9; p= 0.04).

Table 1. The responses given to the statements evaluated the level of knowledge, awareness, daily life, and school life about diabetes.

	Items	Answers (number/percentage)		
		Correct	Wrong	No idea
1	The most common diabetes in the world is T1DM.	213 (36.9%)	**104 (18%)**	260 (45.1%)
2	T1DM is caused by consuming too many sugary (carbohydrate) foods.	184 (31.9%)	**256 (44.4%)**	137 (23.7%)
3	The most common diabetes in childhood is T1DM	**282 (48.9%)**	33 (5.7%)	262 (45.4%)
4	A child with T1DM can eat whatever they want like a healthy child.	**32 (5.5%)**	446 (77.3%)	99 (17.2%)
5	Children with T1DM should not participate in sports/physical education activities.	28 (4.9%)	**419 (72.6%)**	130 (22.5%)
6	When the blood glucose (sugar) level drops (hypoglycemia) in children with T1DM, some symptoms may occur.	**396 (68.6%)**	7 (1.2%)	174 (30.2%)
7	T1DM should not effect the child's school life (participation in class, socialization).	**250 (43.3%)**	216 (37.4%)	111 (19.2%)
8	Drinking a lot of water, frequent urination and weight loss are the findings that can be observed at the time of diagnosis in T1DM.	**435 (75.4%)**	17 (2.9%)	125 (21.7%)
9	T1DM can resolve spontaneously over time.	34 (5.9%)	**367 (63.6%)**	176 (30.5%)
10	There is no individualized treatment plan (nutrition/insulin/exercise) specific to every child with T1DM.	39 (6.8%)	**406 (70.4%)**	132 (22.9%)
11	All children with T1DM can manage their treatment plan and do not need adult support.	53 (9.2%)	**408 (70.7%)**	116 (20.1%)
12	Changes in the blood glucose (sugar) level (hypoglycemia/hyperglycemia) of a child with T1DM may effect exam success, school performance, and attendance at school.	**393 (68.1%)**	57 (9.9%)	127 (22%)
13	A child with T1DM should not be allowed to want something to eat during class (citing blood sugar).	69 (12%)	**403 (69.8%)**	105 (18.2%)
14	Findings such as weakness, fatigue, pallor, sweating, and confusion are observed when blood glucose level decreases (<70 mg/dL).	**395 (68.5%)**	8 (1.4%)	174 (30.2%)
15	The family and the child are responsible for the problems (hypoglycemia/hyperglycemia) that the child with T1DM may experience at school. It is not the responsibility of the school and the teacher.	48 (8.3%)	**390 (67.6%)**	139 (24.1%)
16	The child with T1DM has special needs and therefore, peer bullying, neglect, and abuse are more common.	**237 (41.1%)**	129 (22.4%)	211 (36.6%)
17	If T1DM is not treated correctly and appropriately, it can lead to eye, kidney, cardiovascular, and vascular health problems.	**438 (75.9%)**	7 (1.2%)	132 (22.9%)
18	Children with T1DM can also live healthy years, be successful in their lives, and achieve good academic standing.	**475 (82.3%)**	5 (0.9%)	97 (16.8%)
19	A child with T1DM can measure blood glucose without piercing the fingertip (measurement with a glucometer) and her family can monitor it remotely.	**244 (42.3%)**	44 (7.6%)	289 (50.1%)
20	A child with T1DM cannot do professional sports or become a licensed athlete.	34 (5.9%)	**268 (46.4%)**	275 (47.7%)
21	The activities of a child with T1DM in the school environment and the social environment can effect the blood glucose (sugar) level.	**310 (53.7%)**	73 (12.7%)	194 (33.6%)
22	The target blood glucose (sugar) targets of a child with T1DM do not change throughout life.	38 (6.6%)	**316 (54.8%)**	223 (38.6%)
23	A child with T1DM should be allowed to take his or her needs such as simple carbohydrates (sugar, juice), insulin, blood glucose meter, dipstick, glucagon, and insulin pump when taking the exam.	**436 (75.6%)**	8 (1.4%)	133 (23.1%)

Items 2 and 9 were excluded from the validity analysis due to their low factor loads.

Abbreviations: T1DM: type 1 diabetes mellitus. **The correct answers are shown in bold.**

Discussion

In our study, we evaluated teachers' awareness and knowledge about T1DM with a valid and reliable questionnaire. As far as we know, it is the first study conducted in our province. In our country, as in some countries, guidelines for diabetes management at school have been published. There is an increase in the incidence and prevalence of childhood diabetes in the world. In our study, the level of knowledge, awareness, and the place of life with diabetes in school life was evaluated by the teachers with an appropriate questionnaire and almost half of the participants could answer almost half of the questions correctly (46.4%). In a study conducted with school staff, although 80% of them stated that their experience is sufficient for the management of T1DM in children and adolescents, 90% of them can work comfortably in schools where children with T1DM are present, and only 47.1% of the school staff are observed to be aware of the methods and practices used in diabetes management [5]. In diabetes management, family, child, and school should be in coordination. Psychological problems (depression, eating disorders) are more common in children with T1DM. The prevalence of depression in adolescent diabetics is 2-3 times higher than in healthy individuals [6]. In addition, the fear of hypoglycemia can be observed in the family or teachers. Problems attending school and staying at home due to fear of hypoglycemia are more common in children with diabetes. These conditions can cause problems such as making

Table 2. Questions containing general information about type 1 diabetes treatment management.

Questions	Answers (number/percentage)
What is the blood glucose level of a child with T1DM usually like at the time of diagnosis?	I am not sure (284, 49.2%) Within normal ranges (20, 3.5%) Low (72, 12.5%) **High (201, 34.8%)**
How does insulin effect blood glucose (sugar) levels?	I am not sure (186, 32.2%) Does not effect (6, 1%) **Level down (271, 47%)** Level up (114, 19.8%)
In which way/ways can insulin be administered?	I am not sure (130, 22.5%) Oral pill (7, 1.2%) Oral pill and injection (into the skin) (269, 46.6%) **Injection and pump therapy (171, 29.6%)**
What can be used in the treatment of T1DM?	Surgery (6, 1%) Oral pill (24, 4.2%) Oral pill and insulin (379, 65.7%) **Insulin (168, 29.1%)**
What should a child with low blood glucose (sugar) levels do?	I am not sure (193, 33.4%) **Consuming sugar (270, 46.8%)** Consuming protein (13, 2.3%) Insulin (101, 17.5%)
What should be done in case of confusion, fainting, or seizure that can be observed in a child with T1DM?	I am not sure (320, 55.5%) Oral sugar should be given (29, 5%) **Glucagon injection should be given (116, 20.1%)** Insulin should be administered (112, 19.4%)
What should be done if the blood glucose (sugar) level of a child with T1DM is below 70 mg/dL?	I am not sure (258, 44.7%) Mixed carbs (sandwich, cake) (19, 3.3%) **Simple carbohydrates (sugar cubes, fruit juice, etc…) (269, 46.6%)** Insulin (31, 5.4%)

Abbreviations: T1DM: type 1 diabetes mellitus. **The correct answers are shown in bold.**

insufficient insulin or skipping insulin doses. In long-term studies, early parental responsibility for diabetes management was associated with poor adherence to treatment and poor glycemic control. Therefore, regardless of age, diabetes management mostly depends on the problem-solving skills of the parents [7]. Problems such as socioeconomic inadequacies, inability to reach a healthy meal, low parental education level, insufficient school infrastructure or lack of knowledge and experience of the educator at school, problems in attending school, and frequent school changes also cause weakening of academic achievement. Hypoglycemia or hyperglycemia of a child with T1DM during stress and exam periods may also affect their cognitive abilities [8,9]. In our study, it was questioned whether there were any children with diabetes in the school and this rate was stated to be 28.9%. The presence of an educator who received training on diabetes at school was 11.3%, and the status of being a nurse at school was 3.8% in our questionnaire. In our study, the status of the child with diabetes receiving support from the school/teacher in cases such as insulin administration and additional meal adjustment was found to be around 23.2%, and this rate was observed to be below 20% in a study in which the sub-dimensions of support were also questioned throughout the country (4). In a study conducted in Istanbul, it was observed that more than 80% of the schools did not have nurses, and 50% of the educators were not aware of the emergency treatment of hypoglycemia and had difficulties in administering insulin at school [10]. Although having a nurse at school has an advantage in diabetes management, different results have been observed in studies conducted

Table 3. Questions related to type 1 diabetes management and adequacy of equipment in school.

Questions	Answers		
	Yes	No	No idea
Is there anyone in school who has been trained in diabetes?	65 (11.3%)	167 (28.9%)	345 (59.8%)
Is there a nurse at the school?	22 (3.8%)	539 (93.4%)	16 (2.8%)
Is lunch available for students who are at school all day?	111 (19.2%)	429 (74.4%)	37 (6.4%)
Is there an area/room where the child with T1DM can administer the insulin injection?	166 (28.8%)	310 (53.7%)	101 (17.5%)
Does the child with T1DM have a cabinet for insulin, glucagon, and spare measuring instruments, preferably with a cold storage feature?	239 (41.4%)	228 (39.5%)	110 (19.1%)
Does the child with T1DM receive support from the school/trainer in situations such as insulin administration or additional meal adjustments?	134 (23.2%)	157 (27.2%)	286 (49.6%)
Does the child with T1DM have the opportunity to measure blood sugar and administer insulin in the classroom?	197 (34.1%)	154 (26.7%)	226 (39.2%)
When a child with T1DM faints, the first thing that comes to mind is low blood sugar (hypoglycemia). In this case, urgent intervention is required, the first thing to do is to turn the child on his/her side and administer a glucagon injection (intramuscular) and measure blood sugar at the same time. In this case, is the nearest teacher responsible for making this application?	183 (31.7%)	83 (14.4%)	311 (53.9%)
There is a child with T1DM in the institution where I work.	167 (28.9%)	230 (39.9%)	180 (31.2%)

Abbreviations: T1DM: type 1 diabetes mellitus.

in schools with nurses in the literature. The experience level of the nurse and whether she/he has received any previous education on diabetes are important [11]. These results show us that diabetes education should be repeated at regular intervals. It has been suggested to include these topics in school or university curricula [12]. In our research, it was observed that there were no nurses in 93.4% of the schools, no meals were provided in the school in 74.4%, and no place was arranged for insulin administration in 53.7%. When asked whether there is a lunch for students who are at school all day, 19.2% of the participants answered ''Yes''. This rate was found to be 40% in another study conducted in Turkey [4]. Some of the important results of our study are that most of the teachers do not know the practices to be done for low blood sugar, and they are not aware of the effect of insulin and the way it is applied. When asked what should be done if the blood glucose (sugar) level of a child with T1DM is below 70 mg/dL, 5.4% of the participants answered ''insulin''. Similarly, 19.4% of the participants answered ''insulin'' when asked what to do in case of confusion, fainting, or seizures that can be observed in a child with T1DM. It is understood from these results that more emphasis should be placed on awareness and management of hypoglycemia. While some of the participants answered ''I am not sure'' or oral pills to the question of which way insulin can be administered, 29.6% chose injection or pump therapy as the correct answer. As we revealed in our study, having a child with diabetes at school and having received education on diabetes significantly contribute to the level of knowledge and awareness in diabetes management [13]. We did not question the practical applications of teachers separately, but the literature revealed that teachers should take a more active role in blood glucose measurement, insulin administration, and intervention of hypoglycemia, especially in young children [14,15].

In our research, "Is there an area/room where the child with T1DM can administer the insulin injection?'' The answer to the question was ''No'' by 53.7%. ''Does the child with T1DM have a cabinet for insulin, glucagon, and spare measuring instruments, preferably with a cold storage feature?'' The answer to the question was ''No'' by 39.5%.

A review of diabetes care in the United States published in 2022 found that around 20% of schools did not have locking refrigerators for storing glucagon, insulin, or syringes [16]. The rate of students not being allowed to administer insulin in the classroom is around 79% [16,17]. The rates of schools where students were not allowed to check their blood sugar in the classroom were observed at a rate of 51% [16,18] to 52% [16,17], and the rate of not allowing insulin administration in the classroom was observed at around 79% [16,17]. The rate of being asked to go to school health offices for procedures such as insulin administration or blood sugar control was observed at a rate of 26.7% [16,19].

Our study had some limitations. Firstly, it has a relatively small sample size, and the participation rate among educators was around 3%. Secondly, whether the schools are private or public, the number of schools, and the teachers expertise were not questioned. Thirdly, the questionnaires were obtained through an online system, not face-to-face.

In the literature, there are limited number of survey studies evaluating the knowledge level of teachers about diabetes [20]. More research is needed to make the scales universally usable due to regional and educational differences and limitations such as the intelligibility of the questions.

Conclusion

As a result, we observed that the level of knowledge and awareness about diabetes in schools in our city is not sufficient. We think that in diabetes education, the management of hypoglycemia should be handled more carefully, teachers should be encouraged about practical applications, and awareness should be increased. It is necessary to make up for the deficiencies of schools following children with diabetes and to re-train teachers at regular intervals to keep their knowledge up-to-date.

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Conflict of interest

The author declares that there is no conflict of interest.

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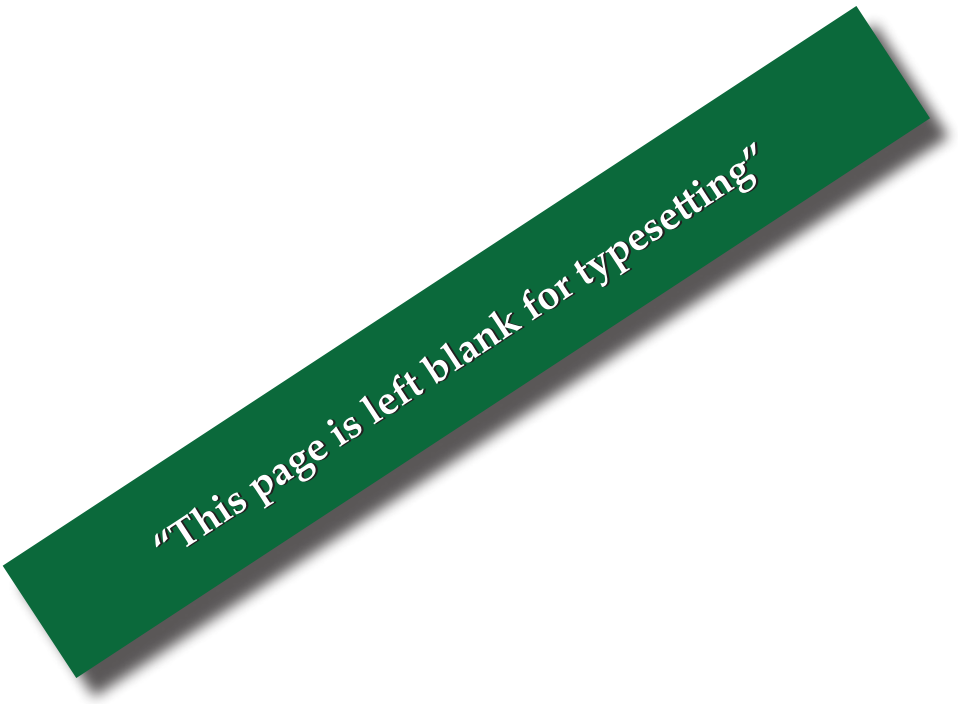
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ORIGINAL ARTICLE

Barriers, vaccine hesitancy and attitudes towards the to the covid-19 vaccine in Türkiye

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Abstract

This study aimed to determine the barriers, vaccine hesitancy and attitudes towards the to the COVID-19 vaccine in Türkiye. A cross-sectional study included 2031 people aged 18 years and older living in Türkiye. Data were collected through an online questionnaire created by the researchers in line with the literature and the Attitudes towards the COVID-19 Vaccine (ATV-COVID-19) scale. In total, 1043 participants (51.4%) defined themselves as vaccine hesitant. The most-motivating factor for vaccination was protecting self and family, while thinking that vaccines are unsafe was the most common barrier against vaccination. Compared to females, being male (OR=0.770) had a 1.3-times (1/0.770) protective effect from vaccination hesitancy, while one unit increase in the ATV-COVID-19 score (OR=0.080) was 12.5-times (1/0.080) protective. As a result of the study, it was observed that there was a high level of vaccine hesitancy due to mistrust of COVID-19 vaccines or fear of side effects. In addition, vaccine hesitancy was associated with gender and the level of attitude towards the vaccine.

Keywords: Attitude, barrier, COVID-19, vaccine, vaccine hesitancy

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Introduction

Pandemics that have affected countries, continents, and even the whole world have caused significant health problems worldwide from past to present [1]. As one such pandemic, COVID-19, is a highly contagious respiratory disease caused by the SARS-CoV-2 virus. [2]. As a result, the World Health Organization (WHO) declared the outbreak a public health emergency of international concern on January 30, 2020 [3]. As of the end of September 2021, COVID-19 caused approximately a quarter billion cases and around 5 million deaths globally [4]. For this reason, many researches are being carried out for the prevention, early diagnosis and treatment of COVID-19 in the world [5]. However, no specific treatment has been found. Therefore, vaccination is probably the best strategy for controlling the COVID-19 pandemic [6,7].

Vaccines are among the most effective preventive measures in public health. Given the high contagiousness of COVID-19, a large percentage of the population must be vaccinated to establish herd immunity [8]. Therefore, the WHO aims to vaccinate 70% of the world's population by June 2022 [4]. However, in many studies conducted in the world and in Türkiye, it has been revealed that there are hesitations about COVID-19 vaccines [9-14]. Vaccine hesitancy, which is defined as the delayed acceptance or rejection of the vaccine despite the availability of vaccination services [15], is seen as a severe threat to the control of the disease [16]. The disease's novelty, the rapid development of the vaccine, and the concerns about the safety and effectiveness of the vaccine have caused some individuals to develop negative thoughts about being vaccinated [17]. To increase the acceptability of the COVID-19 vaccine and reduce hesitation, it is crucial to conduct studies that reveal the extent of the situation and related factors. Therefore, this study aims to determine the barriers, vaccine hesitancy and attitudes towards the to the COVID-19 vaccine in Türkiye.

Materials and Methods

Study Design and Participants

Approval for the research (2021-YÖNP-0832; 20/24) was obtained from the Ethics Committee of Çanakkale Onsekiz Mart University. Consent from the participants was obtained through the informed consent form at the beginning of the online questionnaire. The population of this cross-sectional study consisted of people aged 18 and over (60,863,705) living in Türkiye. In the calculation made using the Epi Info 7.2 program, the sample size was determined as 1308 when at a 95% confidence interval, the incidence of the variable of interest (p), and the margin of error (d) were 0.05 and 5%, respectively. The research was completed with 2031 people who agreed to participate. All participants were Turkish citizens at the age of 18 or over.

Procedure

This study was conducted online from November to December 2021. A data collection form was created using the 'Google Forms' platform and the link to the form was distributed via social media. The data were collected with the questions created by the researchers in line with the literature [11,13,18] and ATV-COVID-19 scale. The 9-item scale, developed by Geniş et al. (2020), has two sub-dimensions: positive and negative attitude [19]. The statements in the scale are evaluated as "Strongly disagree (1)," "Disagree (2)," "Undecided (3)," "Agree (4)," and "Strongly agree (5)" [19]. High scores obtained from the positive attitude sub-dimension indicate that the attitude towards the vaccine is positive. In this study, the *Cronbach's* alpha value of the scale was calculated as 0.91.

Variables

The study's dependent variables were COVID-19 vaccine hesitancy and attitude scale towards COVID-19 vaccines. The independent variables were age, sex, region of residence, marital status, educational status, employment status, income perception, alcohol use, physical activity, health perception, presence of chronic disease, and flu vaccination status.

Statistical Analysis

Statistical analysis was done using the Statistical Package for the Social Sciences (SPSS) software program, version 25.0. Descriptive statistics, Chi-square analysis, and logistic regression analysis

were used to evaluate the data. For the statistical significance, a value of $p<0.05$ was considered sufficient.

Results

Descriptive Findings

The mean age of the participants was 31.4±12.8 years. Most participants were from rural regions. Of the participants, 67.4% (n=1368) were women, 97.4% (n=1959) were Turkish citizens, 88.7% (n=1802) lived in urban areas, and 54.5% (n=1107) lived in the Marmara region. 56.7% (n=1152) were single, 62.2% (n=1263) had no children. 49.7% (n=1010) are university graduates and 43.9% (n=891) are working, 47.7% (n=969) define their income as equivalent to their expenses. Of the participants, 31.8% (n=645) smoked, 31.7% used alcohol, and 44.9% (n=912) exercised occasionally. In addition, 75.8% (n=1541) perceive their health as good and 18.8% (n=370) had chronic diseases. Furthermore, 3.8% (n=77) of the participants had influenza vaccination every year and 6.5% (n=132) in the last year. Other participant features are presented in Table 1.

Motivating Factors vs. Barriers Against Vaccination

From the 1879 participants (92.5%) who were vaccinated against the COVID-19, 77 (4.1%) had one shot, 1499 (79.8%) two shots, 221 (11.8%) three shots, and 82 (4.4%) four shots. While 48.6% (n=986) trusted the vaccine, 11.5% (n=233) had no trust, and 39.9% (n=810) were not sure. Furthermore, 1043 participants (51.4%) defined themselves as vaccine hesitant. The most-motivating factor for vaccination was protecting self and family while thinking that vaccines are unsafe was the most common barrier against vaccination (Table 2).

Univariate Comparisons

Cronbach's alpha internal validity score of the 9-item Attitudes towards the COVID-19 Vaccine (ATV-COVID-19) scale was calculated as 0.914. Mean (±SD) values for the total ATV-COVID-19, ATV-COVID-19 positive, and ATV-COVID-19 negative scores were 3.5±0.8, 3.7±1, and 3.4±0.8, respectively. ATV-COVID-19 scores were significantly associated with all the analyzed variables. There was no significant difference between the scores of males and females, but those not disclosing their sex had substantially lower values. High school graduates, people with poor/very poor health perceptions, and those with vaccine hesitancy had significantly lower scores in their categories. On the other hand, people with chronic diseases or those vaccinated against flu or COVID-19 had considerably higher scores (Table 3). There was a significant positive correlation between age and total ATV-COVID-19 scores (Spearman $r=0.202$, $p<0.001$).

Vaccine hesitancy was associated with most of the studied variables too. Women and participants not disclosing their sex had higher vaccine hesitancy than men. Higher vaccine hesitancy was observed in high school graduates and those without chronic diseases (Table 4).

Factors Associated with Vaccine Hesitancy

A binary logistic regression analysis was performed to check for factors affecting the main outcome variable vaccination hesitancy (present/absent) after correcting potential confounders. All significant variables in the univariate comparisons were entered into the model. The model revealed a Nagelkerke R square of 51% and a sensitivity and specificity of 79.9% in detecting vaccination hesitancy. The regression analysis showed that male sex and higher ATV-COVID-19 scores were the only independent predictors of vaccination hesitancy. Compared to females, being male (OR=0.770) had a 1.3-times (1/0.770) protective effect from vaccination hesitancy, while one unit increase in the ATV-COVID-19 score (OR=0.080) was 12.5-times (1/0.080) protective (Table 5).

Table 1. Participant features.

		n	%
Sex	Female	1368	67.4
	Male	651	32.1
	Not disclosed	12	0.6
Region	Middle Anatolia	226	11.1
	East Anatolia	128	6.3
	South-East Anatolia	64	3.2
	Aegean	172	8.5
	Marmara	1107	54.5
	Mediterranean	106	5.2
	Black Sea	228	11.2
Marital status	Married	808	39.8
	Single	1152	56.7
	Divorced	61	3
	Widowed	10	0.5
Educational status	Primary school	53	2.6
	Middle school	47	2.3
	College	717	35.3
	University	1010	49.7
	Masters/PhD	204	10
Employment	Working	891	43.9
	Not working	221	10.9
	Unemployed	31	1.5
	Housewife	64	3.2
	Retired	80	3.9
	Student	744	36.6
Income/Expenses	Balanced	969	47.7
	Minus	801	39.4
	Plus	261	12.9
Alcohol consumption	Yes, regularly	194	9.6
	No	1394	68.6
	Yes, rarely	443	21.8
Physical activity	Yes, regularly	399	19.6
	No	720	35.5
	Yes, irregularly	912	44.9
Health perception	Excellent	275	13.5
	Good	1266	62.3
	Average	460	22.6
	Poor	27	1.3
	Very poor	3	0.1
Flu vaccination	Each year regularly	77	3.8
	Once every 2-3 years	95	4.7
	1-2 times	484	23.8
	Never	1375	67.7

Discussion

Vaccination appears to be the most effective strategy to control the COVID-19 infection, causing devastating health problems worldwide since 2020 [16]. However, the results of this study showed that 51.4% of the participants were hesitant about the vaccine. In many studies conducted in different countries, there is hesitancy about COVID-19 vaccines at varying rates [20-24]. These differences between countries may be due to the socio-demographic and cultural characteristics of the study group. However, although approximately half of the participants were vaccine-hesitant in the current study, the vaccination refusal rate was 7.5%. In a previous study conducted by Salali et al. (2020) in Türkiye, it was reported that 31% of the participants were hesitant about vaccination, and 3% refused to be vaccinated [13]. It is noteworthy that there has been a significant increase in both hesitation and rejection rates over time. To develop strategies to increase COVID-19 vaccination rates, it is essential to understand the factors that encourage and hinder vaccination. In the current study, protecting oneself/family and relying on the protective effects of vaccines were among the most encouraging factors. Similarly, in the study of Arce et al. (2021), the most common reason for vaccine acceptance was personal protection against COVID-19 infection [25]. Also, thinking that vaccines are unsafe, and fear of side effects were among the most common barriers to getting

Table 2. Motivating and barrier factors for COVID-19 vaccination.

Motivating Factors for Vaccination	**n**	**%**
Protecting self and family	1047	50.4
Relying on the protective effects of vaccines	947	45.6
Advice from healthcare professionals	790	38.1
Obligations by the school	431	20.8
Perception of being under risk	374	18
Results of own investigation	324	15.6
Presence of chronic diseases	167	8
Obligations by the employer	154	7.4
News in the media	142	6.8
Vaccine being free	124	6
Traveling abroad	112	5.4
Advice from religious leaders	13	0.6
Barriers to vaccination	**n**	**%**
Thinking that vaccines are unsafe	94	4.5
Afraid of the side effects of the vaccine	84	4
Thinking that vaccines contain harmful substances	55	2.6
Thinking that vaccines tamper the human DNA	39	1.9
Perceived no need because handwashing, wearing a mask and gloves	30	1.4
Perception of not being under risk	24	1.2
Being generally against all vaccines	20	1
Fatalism	16	0.8
Thinking that vaccines contain religiously forbidden substances	16	0.8
Afraid of getting infertile	15	0.7
Afraid of getting vaccinated	14	0.7
Is allergic	13	0.6
Having chronic diseases	8	0.4
Lack of knowledge	5	0.2

Table 3. Univariate comparison of the ATV-COVID-19 scores between the studied variables.

		ATV-COVID-19 score				ATV-COVID-19 positive				ATV-COVID-19 negative			
Variables		Mean	SD	F	*p*	Mean	SD	F	*p*	Mean	SD	F	*p*
Sex	Female (n=1368)	3.5[a]	0.8	5.755	0.003	3.7[a]	1	5.040	0.008	3.5[a]	0.8	5.065	**0.006**
	Male (n=561)	3.5[a]	0.8			3.7[a]	1.1			3.5[a]	0.8		
	Not disclosed (n=12)	2.7	0.7			2.8	1			2.7	0.7		
Educational status	Primary s. (n=53)	3.9[a]	0.9	9.615	<0.001	4.0[a]	1.1	7.198	<0.001	3.8[a]	1	9.659	<0.001
	Secondary s. (n=47)	3.6[a,b]	0.9			3.8[a,b]	1.1			3.5[a,b]	1		
	High s. (n=717)	3.4[b]	0.7			3.6[b]	1			3.3[b]	0.7		
	University (n=1010)	3.6[a]	0.8			3.7[a]	1			3.5[a]	0.8		
	Masters (n=204)	3.7[a]	0.9			3.9[a]	1.1			3.6[a]	0.9		
Health perception	Excellent (n=275)	3.5[a,b]	0.9	4.157	0.006	3.7[a,b]	1.2	3.819	0.01	3.4[a]	0.9	3.548	0.014
	Good (n=1266)	3.6[a]	0.8			3.7[a]	1			3.5[a]	0.8		
	Average (n=460)	3.5[a,b]	0.8			3.6[a,b]	1			3.4[a]	0.8		
	Poor/very poor (n=30)	3.2[b]	0.9			3.2[b]	1.1			3.1[a]	0.8		
Chronic disease	Yes (n=370)	3.7	0.8	4.005	<0.001	3.9	1	3.940	<0.001	3.6	0.8	2.923	0.004
	No (n=1661)	3.5	0.8			3.7	1			3.4	0.8		
Flu vaccination in the last year	Yes (n=133)	3.8	0.7	4.234	<0.001	4.0	0.8	3.858	<0.001	3.7	0.8	4.015	<0.001
	No (n=1899)	3.5	0.8			3.7	1			3.4	0.8		
COVID-19 vaccination	Yes (n=1879)	3.6	0.7	18.290	<0.001	3.8	0.9	18.521	<0.001	3.5	0.8	15.190	<0.001
	No (n=152)	2.4	0.8			2.3	1			2.5	0.8		
Vaccine hesitancy	No (n=986)	4.0	0.6	34.362	<0.001	4.3	0.7	30.623	<0.001	3.9	0.7	30.959	<0.001
	Yes (n=1043)	3.0	0.7			3.1	0.9			3.0	0.7		

Each superscript letter denotes a subset of categories whose column means do not differ significantly from each other at the 0.05 level (after correcting according to Türki**ye**

vaccinated. Our findings were in good agreement with those reported in other studies [9,20,26-28]. The reason for this may be the spread of negative or inaccurate news heard from the environment or the media. Therefore, population-oriented COVID-19 vaccines must emphasize the high efficacy rates in reducing or eliminating diseases, hospitalizations and deaths, and that accurate, evidence-based information is provided about possible side effects [25,27].

Vaccine hesitancy is a phenomenon influenced by several factors [28]. In this study, several results related to vaccine hesitancy were obtained. The first was that men's vaccination hesitations were lower than that of women. Similarly, studies have reported that males have lower vaccination hesitations [12,21,25,29,30]. In some studies, the demonstration that COVID-19 complications and mortality rates are higher in men may have led men to vaccination [31,32]. Another factor associated with vaccine hesitancy in this study was the attitude towards the vaccine. Similarly, the results of studies have revealed the

Table 4. Univariate comparison of vaccine hesitancy between the studied variables.

		Vaccine Hesitancy					
		No		Yes			
		n	%	n	%	χ^2	*p*
Sex	Female (n=1368)	646_a	47.3	721_a	52.7	6.405	**0.041**
	Male (n=561)	337_a	51.8	313_b	48.2		
	Not disclosed (n=12)	3_a	25.0	9_a	75.0		
Educational status	Primary s. (n=53)	29_a	54.7	24_a	45.3	11.654	**0.02**
	Secondary s. (n=47)	24_a	51.1	23_a	48.9		
	High s. (n=717)	317_a	44.3	399_b	55.7		
	University (n=1010)	501_a	49.7	508_a	50.3		
	Masters (n=204)	115_a	56.4	89_b	43.6		
Health perception	Excellent (n=275)	135_a	49.1	140_a	50.9	11.119	**0.011**
	Good (n=1266)	643_a	50.9	621_b	49.1		
	Average (n=460)	198_a	43.0	262_b	57.0		
	Poor/Very poor (n=30)	10_a	33.3	20_a	66.7		
Chronic disease	Yes (n=370)	201_a	54.3	169_b	45.7	5.946	**0.015**
	No (n=1661)	785_a	47.3	874_b	52.7		
Flu vaccination in the last year	Yes (n=133)	75_a	56.8	57_a	43.2	3.821	0.051
	No (n=1899)	911_a	48.0	986_a	52.0		
COVID-19 vaccination	Yes (n=1879)	975_a	51.9	904_b	48.1	110.395	**<0.001**
	No (n=152)	11_a	7.3	139_b	92.7		

Each subscript letter denotes a subset of Vaccine hesitancy categories whose column proportions do not differ significantly from each other at the 0.05 level (after Bonferroni correction).

Table 5. Logistic regression computer output.

	B	SE	Wald	*p*	Exp(B)	*95% CI*	
						Lower	Upper
Sex (ref. cat.: female n=1367)			4.434	0.109			
Male (n=650)	-0.262	0.127	4.281	**0.039**	0.77	0.601	0.986
Not disclosed (n=12)	-0.408	0.786	0.269	0.604	0.665	0.143	3.103
Educational status (ref. cat.: primary s.)			3.389	0.495			
Secondary s.	-0.342	0.553	0.383	0.536	0.71	0.24	2.099
High s.	-0.575	0.408	1.989	0.158	0.562	0.253	1.251
University	-0.395	0.402	0.962	0.327	0.674	0.306	1.483
Masters	-0.466	0.435	1.151	0.283	0.627	0.268	1.47
Health perception (ref. cat.: very good)			2.203	0.531			
Good	0.002	0.182	0.000	0.991	1.002	0.701	1.432
Average	0.211	0.213	0.983	0.322	1.235	0.814	1.874
Poor/Very poor	0.222	0.521	0.182	0.67	1.248	0.45	3.463
Chronic disease (present vs. absent)	0.086	0.162	0.283	0.595	1.09	0.794	1.497
Flu vaccination in last year (yes vs. no)	-0.133	0.236	0.318	0.573	0.876	0.552	1.39
ATV-COVID-19 score	-2.527	0.115	485.4	**<0.001**	0.08	0.064	0.10
Constant	9.393	0.691	184.6	<0.001	12002.4		

Dependent variable: vaccine hesitancy

relationship between people's attitudes towards COVID 19 vaccines and vaccine hesitancy [20,33]. Therefore, it is vital to develop strategies to increase positive attitudes towards vaccines. WHO recommends giving understandable, simple messages emphasizing high confidence in vaccines [34]. It is essential not to ignore the concerns of individuals who express hesitation or reluctance about vaccination [22].

The strength of this study is the inclusion of a high number of participants from seven different geographical regions of Türkiye. However, one weakness is that the study was conducted using an online survey instead of face-to-face interviews due to the COVID-19 outbreak. Consequently, reporting bias must be taken into account. In addition, those who have problems accessing the Internet was not included in the study. This affects the generalizability of the results.

Conclusion

This study showed a high level of vaccine hesitancy due to distrust of COVID-19 vaccines or fear of side effects. In addition, COVID-19 vaccine hesitancy was associated with gender and the level of attitude towards the vaccine. In this context, it may be recommended to organize health trainings containing evidence-based information focusing on the effectiveness of COVID-19 vaccines for the general population by public health nurses and to hang awareness posters about the importance of vaccines in various health institutions (Family Health Centers, Hospitals).

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Conflict of interest

No competing interests to disclose.

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ORIGINAL ARTICLE

Investigation of symptoms and mortality in hypertension patients diagnosed with COVID-19: A retrospective case-control study

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Abstract

It was aimed to determine whether there is a difference in mortality and symptoms between patients, aged 60 years or above, with hypertension (HT) and Coronavirus disease 2019 (COVID-19) infection and those without any chronic disease. The population of the study, which was conducted as a retrospective case-control study, consisted of 2747 HT patients diagnosed with COVID-19 and aged 60 years or above. While 170 patients with HT diagnosis formed the case group, 170 patients without any chronic disease formed the control group from the sample. In this study, the time from diagnosis to death was found to be shorter in the presence of HT in COVID-19 patients, while males diagnosed with COVID-19 had higher rates of intensive care unit admittance, intubation and mortality than females irrespective of HT. The presence of HT was determined not to affect symptoms in patients diagnosed with COVID-19. The most common symptoms were fatigue, cough, body ache, fever, headache, and sore throat in HT and control groups and the symptoms were similar in both groups. Further studies are recommended to reveal the relationship between HT, considered one of the most important risk factors for COVID-19, and adverse outcomes related to COVID-19.

Keywords: COVID-19, hypertension, symptom.

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Introduction

Hypertension (HT) is the leading cause of loss of Disability Adjusted Life Years (DALY) among cardiovascular diseases. In 2010, 31.1% of the world's adult population was found to have HT [1, 2]. The Coronavirus 2019 (COVID-19) pandemic began in December 2019 when a group of patients with pneumonia of unknown cause was seen in Wuhan, China. COVID-19, spreading rapidly worldwide, has been officially recognized as a public health emergency by the World Health Organization (WHO). COVID-19 has been the largest pandemic in the last 100 years. It has affected more than 200 countries and millions of people worldwide [3]. The disease pathogen has been named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). COVID-19 caused severe acute respiratory syndrome (SARS) and was associated with intensive care admission and high mortality. HT was among the major comorbidities in cases of death. Some of the study results have shown that patients with severe COVID-19 have a higher prevalence of HT [4-7]. The prevalence of HT in COVID-19 patients ranges from 15-20 % to 30-35 in different studies [6, 8-13]. There are various reasons for these different results. The most important of these is the significantly higher mean age in patients with a high prevalence of HT [6, 8, 9, 11, 14-17]. Angiotensin-converting enzyme 2 (ACE2) is the main active peptide of the renin-angiotensin-aldosterone system (RAAS). ACE2, which targets angiotensin II, is protective in the cardiovascular system and many other organs. It also provides protection against severe acute lung failure caused by severe acute respiratory syndrome (SARS) coronavirus infection. Decreased ACE2 shifts the balance in the RAAS to the angiotensin II (Ang II)/ Angiotensin II receptor type 1 (AT1R) axis, which leads to the progression of heart failure. SARS-CoV-2 binds to ACE2 with high affinity through its spike (S) glycoprotein. COVID-19 infection leads to a further decrease in ACE2, causing RAAS imbalance and aggravation of cardiovascular disease [18-22]. The majorities of COVID-19 patients over 60 years of age has HT and are therefore at higher risk if they are infected with SARS-CoV-2 [23]. In this study, it was aimed to determine whether there is a difference in mortality and symptoms between patients, aged 60 years or above, with HT and COVID-19 infection and those without any chronic disease.

Materials and Methods

The study was conducted as a retrospective case-control study. The study population consisted of 2747 patients, aged 60 years or above, who were diagnosed with COVID-19 in the city of Afyonkarahisar in Türkiye between 01.09.2020 and 30.11.2020. The sample size of 338 was determined using the Power 3.1 program based on the population size. The study's sample size was adjusted to 340 to account for potential data loss. Within this sample, 170 patients diagnosed with hypertension formed the case group, while the control group consisted of 170 patients without any chronic disease. The case and control groups were selected from eligible patients meeting the specified criteria through a simple random sampling method. Patients, who were below 60 years of age, whose records could not be accessed, and who had one or more chronic diseases (diabetes mellitus (DM), chronic obstructive pulmonary disease (COPD), cardiovascular disease (CVD), renal failure, cancer) in addition to HT were excluded from the case group. Patients, who were below 60 years of age, whose records could not be accessed, or who had any chronic diseases, were not included in the control group. Our study data were obtained from the records created by the contact tracing teams of Afyonkarahisar Central Community Health Center with the "Data Collection Form" created by the researchers. Ethics committee approval (2021/1) was obtained from the Non-Interventional Clinical Research Ethics Committee of Afyonkarahisar Health Sciences University to conduct the study.

Statistical analyses were performed using the IBM SPSS Statistics 26.0 package program. Descriptive statistics were given as a number, percentage, mean and standard deviation. The visual (histogram and the normal probability plot) and analytical methods (*Kolmogorov-Smirnov*, *Shapiro-Wilk* tests) were used to check whether the variables had a normal distribution. Quantitative variables that did not show normal distribution were analyzed with the Mann-

Whitney U test between the two groups. Chi-square analysis and Fisher's exact test were preferred for comparison of nominal data. Comparisons with a *p*-value below 0.05 were considered statistically significant.

Results

The mean age of the HT groups was 68.79±6.9 years and in both groups, 50% of the participants were female and 50% were male. No significant difference was found between the two groups in terms of age and gender ($p>0.05$) (Table 1).

There was no significant difference between the groups according to the time from diagnosis to recovery, hospitalization status, duration of hospital stay, intensive care admission status, duration of intensive care stay and mortality rates ($p>0.05$). There was a statistically significant difference between the groups according to the time from the diagnosis of the disease to death and this time was shorter in the HT group ($p=0.045$) (Table 2).

In the HT group, the time from diagnosis to recovery was longer in male patients than in female patients ($p=0.012$), whereas in the control group, there was no significant difference in the time from diagnosis to recovery according to gender ($p>0.05$). Furthermore, male patients had more hospitalizations than female patients in the HT group ($p=0.033$), while there was no significant difference between hospitalization and gender in the control group ($p>0.05$). When the groups were reviewed in terms of duration of hospital stay, no statistically significant difference was found in the HT group according to gender ($p>0.05$), whereas in the control group, the duration of hospital stay was longer in male patients ($p=0.045$). Intensive care unit admission ($p=0.001$ and $p=0.007$), intubation ($p=0.003$ and $p=0.005$) and mortality ($p=0.002$ and $p=0.005$) rates were significantly higher in males in both groups. There was no significant difference in the duration of intensive care stay and the time from diagnosis to death according to gender in both groups ($p>0.05$) (Table 3).

The majority of the patients (95.3% in the HT group and 91.2% in the control group) had COVID-19 symptoms. There was no significant difference between the groups according to the presence of symptoms ($p>0.05$). The most common symptoms were fatigue (45.3% and 44.7%), cough (41.8% and 35.3%), body aches (29.4% and 31.8%), fever (22.9% and 22.9%), headache (17.6% and 21.6%), and sore throat (18.8% and 12.9%) in HT and control groups and the symptoms were similar in both groups. Comparison was carried out between the groups for each symptom, however, there was no significant difference between the groups according to any symptom ($p>0.05$). The most common first symptom at the onset of the disease was sore throat ($p=0.001$) in the HT group, while body aches and chills were the most common first symptoms in the control group ($p=0.001$ and $p=0.037$) (Table 4).

Discussion

In our study, patients with comorbidity of HT formed the case group among the patients diagnosed with COVID-19. HT was reported to be the most common comorbidity in COVID-19 patients in meta-analysis studies [24-26]. DM, CVD and COPD were noted as the other most common comorbidities [6, 8-11, 14-16, 25, 27, 28]. Although patient records and follow-up data are limited, HT is more prevalent in COVID-19 patients admitted to the intensive care unit, requiring mechanical ventilation and resulting in death. Therefore, it is important to reveal the determinant effect of HT on mortality in COVID-19 patients [10, 12, 14, 17, 29, 30]. There was a statistically significant difference between the groups according to the time from the diagnosis of the disease to death and the time was shorter in the HT group. In the literature, Ruan et al. [31] reported that mortality was more common in COVID-19 patients with HT, Wu et al. [32] noted that the mortality rate was 2.3% in COVID-19 and increased to 6% with the presence of HT, Zhou et al. [12] highlighted that HT increased the risk of mortality 3.05 times in COVID-19, Barrera et al. [33] determined that HT increased the risk of mortality by 2.39 times in COVID-19 patients, and Yanbin et al. [34] found that patients with HT had a 2.17 times higher risk of mortality due to COVID-19. In the study by Pena et al. [26], the case mortality rate was higher in males (20.2%) than in females (13%). Although all these findings support our study, the fact

Table 1. Demographic data of the patients in the HT group and the control group.

	HT group n=170	Control group n=170	*P* value
Age (years), mean ± SD	68.79±6.9	68.45±6.86	0.606#
Gender, n (%)			
Female	85 (50)	85 (50)	-
Male	85 (50)	85 (50)	

HT: Hypertension; mean ± SD: Mean ± standard deviation; # Analyzed with the Mann-Whitney U Test.

Table 2. Comparison of data on hospitalization, intensive care unit admission and mortality of patients in HT group and control group.

	HT group n=170	Control group n=170	P value
Time from diagnosis to recovery (days), mean ± SD	15.52±3.44	15.6±3.12	0.817#
Hospitalization, n (%)			
Yes	42 (24.7)	40 (23.5)	0.800*
No	128 (75.3)	130 (76.5)	
Duration of hospital stay (days), mean ± SD	12.95±7.84	15.9±9.17	0.106#
Intensive care admission, n (%)			
Yes	20 (11.8)	19 (11.2)	0.865#
No	150 (88.2)	151 (88.8)	
Duration of stay in intensive care (days) mean ± SD	8.63±7.04	9.33±6.37	0.737#
Intubation, n (%)			
Yes	15 (8.8)	17 (10)	0.710*
No	155 (91.2)	153 (90)	
Mortality, n (%)			
Yes	16 (9.4)	17 (10)	0.855*
No	154 (90.6)	153 (90)	
Time from diagnosis to death (days), mean ± SD	14.62±10.78	18.64±10.55	**0.045#**

*HT: Hypertension; mean ± SD: Mean ± standard deviation; # Analyzed with the Mann-Whitney U Test; *Analyzed with the Pearson Chi-Square Test; ≠Analyzed with the Fisher's Exact Test.*

that mortality occurs in a shorter time in HT patients suggests that HT may be an accelerating factor for mortality. In our study, the time from diagnosis to recovery in the HT group was longer in male patients than in female patients. This data indicated that the disease lasted longer in male patients with HT, that is, recovery was delayed. Furthermore, hospitalization was higher in male patients in the HT group. In line with these findings, it can be suggested that the combination of HT and male gender is associated with more severity of COVID-19 infection. Also, Pranata et al. [35] showed that HT increased the severity of the disease 2.04-fold in patients with COVID-19 and that the relationship between HT and COVID-19 was stronger with male gender, as in our study. Yanbin et al. [34], stated in their meta-analysis study that caution should be exercised especially in HT patients who are male and >60 years of age, in line with our study. Our findings are in line with the literature findings, as negative outcomes are more common in male patients also in the literature.

If the presence of intensive care admission and intubation in patients is interpreted as an increase in the severity of the disease, no significant difference was found in our study that HT affects the severity of COVID-19. However, there are also studies with different results compared to our study in the literature. Li et al. [10] have shown that HT, CVD and DM increased the severity of disease two to three times more in COVID-19 patients, while HT was reported to increase the severity of COVID-19 disease 2.3 times in the study by Chen Y et al. [36], and HT was noted to increase the severity of disease 3.64 times in COVID-19 patients in the study by Chen C et al. [37].

Table 3. Comparison of data on hospitalization, intensive care unit admission and mortality of patients in the HT group and control group according to gender.

	HT group n=170		Control group n=170	
	Female n=85	Male n=85	Female n=85	Male n=85
Time from diagnosis to recovery (days), mean ± SD	15.09±3.61	15.95±3.22	15.18±2.75	16.01±3.42
P value	0.012#		0.074#	
Hospitalization, n (%)				
Yes	15 (17.6)	27 (31.8)	15 (17.6)	25 (29.4)
No	70 (82.4)	58 (68.2)	70 (82.4)	60 (70.6)
P value	0.033*		0.071*	
Duration of hospital stay (days) mean ± SD	12.80±10.03	13.03±6.53	12.66±6.65	17.84±10.02
P value	0.599#		0.045#	
Intensive care admission, n (%)				
Yes	3 (3.5)	17 (20)	4 (4.7)	15 (17.6)
No	82 (96.5)	68 (80)	81 (95.3)	70 (82.4)
P value	0.001*		0.007*	
Duration of stay in intensive care (days), mean ± SD	11.33±9.29	8.12±6.8	9.5±6.55	9.28±6.56
P value	0.398#		0.957#	
Intubation, n (%)				
Yes	2 (2.4)	13 (15.3)	3 (3.5)	14 (16.5)
No	83 (97.6)	72 (84.7)	82 (96.5)	71 (83.5)
P value	0.003*		0.005*	
Mortality, n (%)				
Yes	2 (2.4)	14 (16.5)	3 (3.5)	14 (16.5)
No	83 (97.6)	71 (83.5)	82 (96.5)	71 (83.5)
P value	0.002*		0.005*	
Time from diagnosis to death (days), mean ± SD	18.5±10.6	14.07±11.08	15±4.35	19.42±11.42
P value	0.200#		0.752#	

*HT: Hypertension; mean ± SD: mean ± standard deviation; # Analyzed with the Mann-Whitney U Test; *Analyzed with the Pearson Chi-Square Test; ≠Analyzed with the Fisher's Exact Test.*

In our study, the most common symptoms were fatigue, cough and sore throat in the HT group and similarly fatigue, cough and body ache in the control group. The comparison was carried out between the groups for each symptom; however, there was no significant difference between the groups according to any symptom. In our study, it was concluded that HT did not affect disease symptoms. Similarly, Shaghee et al. [38] reported that the most common symptom in COVID-19 patients with HT was fever, followed by cough, shortness of breath, and fatigue, and Chengyi et al. [39] stated that the symptoms observed in HT and control groups were fever and cough, and no significant difference was found between the groups. In this respect, our study

Table 4. Comparison of HT group and control group according to presence of symptoms, first symptoms and symptoms seen.

	HT group n=170 *n (%)*	Control group n=170 *n (%)*	*P* value
Presence of Symptoms	162 (95.3)	155 (91.2)	0.131*
First symptom			
Fatigue	36 (22.2)	34 (21.9)	0.789*
Cough	35 (21.6)	31 (20)	0.538*
Sore throat	24 (14.8)	7 (4.5)	0.001*
Fever	12 (7.4)	15 (9.7)	0.547*
Body ache	7 (4.3)	24 (15.5)	0.001*
Headache	7 (4.3)	10 (6.5)	0.455*
Dyspnea	6 (3.7)	5 (3.2)	0.759*
Loss Of Appetite	5 (3.1)	2 (1.3)	0.448≠
Sweating	5 (3.1)	2 (1.3)	0.448≠
Tremors	4 (2.5)	3 (1.9)	1.000≠
Nausea	4 (2.5)	4 (2.6)	1.000≠
Diarrhea	3 (1.9)	3 (1.9)	1.000≠
Vomiting	3 (1.9)	0 (0.0)	0.248≠
Back pain	3 (1.9)	2 (1.3)	1.000≠
Loss of taste and smell	2 (1.2)	2 (1.3)	1.000≠
Chest pain	2 (1.2)	0 (0.0)	0.499≠
Back pain	2 (1.2)	1 (0.6)	1.000≠
Chills	1 (0.6)	8 (5.3)	0.037≠
Runny nose	1 (0.6)	1 (0.6)	1.000≠
Nasal congestion	0 (0.0)	1 (0.6)	1.000≠
Symptoms			
Fever	39 (22.9)	39 (22.9)	1.000*
Cough	71 (41.8)	60 (35.3)	0.220*
Dyspnea	16 (9.4)	13 (7.6)	0.560*
Tremors	15 (8.8)	20 (11.8)	0.372*
Body ache	50 (29.4)	54 (31.8)	0.638*
Fatigue	77 (45.3)	76 (44.7)	0.913*
Runny nose	11 (6.5)	8 (4.7)	0.479*
Sore throat	32 (18.8)	22 (12.9)	0.138*
Headache	30 (17.6)	35 (20.6)	0.490*
Diarrhea	5 (2.9)	11 (6.5)	0.124*
Nausea	16 (9.4)	18 (10.6)	0.718*
Vomiting	8 (4.7)	6 (3.5)	0.585*
Loss Of Appetite	13 (7.6)	10 (5.9)	0.517*
Dizziness	1 (0.6)	0 (0.0)	1.000≠
Loss of taste and smell	6 (3.5)	6 (3.5)	1.000*
Sweating	10 (5.9)	7 (4.1)	0.455*
Chills	8 (4.7)	8 (4.7)	1.000*
Sneezing	1 (0.6)	0 (0.0)	1.000≠
Back pain	4 (2.4)	5 (2.9)	1.000≠
Chest pain	4 (2.4)	0 (0.0)	0.123≠
Nasal congestion	0 (0.0)	1 (0.6)	1.000≠
Back pain	1 (0.6)	1 (0.6)	1.000≠
Palpitations	0 (0.0)	1 (0.6)	1.000≠
Hemoptysis	0 (0.0)	0 (0.0)	-

**Analyzed with the Pearson Chi-Square Test; ≠Analyzed with the Fisher's Exact Test.*

result shows similarities with the literature. In some studies, there is no clarity on whether HT is an independent risk factor for COVID-19 patients [40-42]. However, in this study, when the time from the diagnosis of COVID-19 to death was analyzed, the presence of HT was determined to be a risk factor. This is thought to have developed due to increased endothelial cell activation, endothelial dysfunction and prothrombotic effect in the case group [20, 43-46]. The limitations of our study are that it was retrospective and conducted in a single center. There is a need for further prospective and multicenter studies.

Conclusion

In this study, the time from diagnosis to death was found to be shorter in the presence of HT in COVID-19 patients, while males diagnosed with COVID-19 had higher rates of intensive care unit admittance, intubation, and mortality than females irrespective of HT. The presence of HT was determined not to affect symptoms in patients diagnosed with COVID-19. Further studies are recommended to reveal the relationship between HT, considered one of the most important risk factors for COVID-19, and adverse outcomes related to COVID-19.

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Conflict of interest

There are no conflicts of interest for the authorship and/or publication of this study.

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ORIGINAL ARTICLE

Clinicians' perspectives as medical teachers: A qualitative study

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Abstract

Clinicians both have the responsibility to take care of the patients and to facilitate students to learn. Having different responsibilities at the same time can be stressful for medical teachers and can affect their identity as medical teachers. The aim of the study is to determine and identify approaches to the teaching of medical teachers in a university hospital. The methodology of the research is qualitative research. The educational case study method was used to develop an in-depth understanding of medical teachers' teaching approaches. We asked the meaning of being a medical teacher, the related factors with teaching, and their best experiences of teaching by individual in-depth interview. Nine individual in-depth interviews were held with participants. The most experienced medical teacher has the 27-year of experience and the junior one has 6 months of experience. Three main themes have emerged. The issues at clinical education, teachers' perspectives on clinical education, and the roles of students and teachers at clinical education. Our study shows the residents, nurses, peer students have roles in clinical education in addition to medical teachers. One of the issues is the limitation to standardize clinical education for each student. All participants mentioned they become an academician for the greater good. The medical teachers are expecting the students to have a high level of situated interest. However, increasing students' situated interest is up to their prior knowledge of the context, the characteristics of the learning activity, the learning environment, and the approach to the teaching of medical teachers.

Keywords: Medical education, teaching, interview, clinical ethics

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Introduction

The healthcare system is a complex system with patients, clinical environments, and learners. The priority of this system is patients and patient care. The healthcare system is dynamic and based on the social system [1]. Clinicians are health caregivers and medical teachers in the clinical environment. They both have the responsibility to take care of the patients and to facilitate students to learn. Also, some clinicians have responsibilities at the organizational level [2]. However, there are also ethical and legal responsibilities that clinicians are obliged to comply with. The responsibilities of clinicians are clearly defined in legal documents; however, it's still important to think about ethical responsibilities because ethical dilemmas are frequently encountered in the clinical environments. Clinicians should continue their daily medical practices by recognizing ethical dilemmas and evaluating these dilemmas correctly. As can be seen, having different responsibilities at the same time can be stressful for medical teachers and can affect their identity as medical teachers [3]. This is why there is a need for evaluation of medical teachers' perspectives and experiences in clinical environments.

The teaching approach can be identified as the way of teaching [4]. The teaching approaches of teachers are also related to student's engagement with learning content [5]. There are three broad concepts of teaching approaches: teacher-centred, student-centred, and teacher-student interaction. Teachers focus on the delivery of knowledge and content in a teacher-centred approach. In a student-centred approach, teachers act as facilitators and try to engage students for effective learning. In teacher-student interaction, the approach connects the two approaches [4]. These approaches have a role in shaping the quality of clinical education.

In the relevant literature, Bearmen et al. identified the strengths and weaknesses of clinical teaching. The strengths were establishing relationships, clinical expertise, communication skills, enthusiasm, and individual characteristics. The weaknesses were giving feedback, promoting reflection, and developing teaching strategies [6]. Students' feedback is stated as a factor in improving the teaching approaches of medical teachers [7]. One of the barriers to improving clinical teaching is the resistance of medical teachers to change [8]. Faculty development programs contribute to overcoming this barrier by conducting cultural belonging; however, these programs should be well-structured [9]. In addition, reflective practices are needed in the learning of ethical and professional behavior in the clinic, and this is also important in terms of the medical teacher-student relationship [10]. The knowledge of the strengths and limitations of clinical education would contribute to improving the structure of medical education. So, it's important to explore the teaching approaches of medical teachers in current education.

In a relevant study, medical teachers and students were asked to fill out a questionnaire about the characteristics of a good medical teacher [11]. Three domains and the perceptions of the medical teachers and students to these domains were determined. Personal domain, clinician domain, and teacher domain. The personal domain is defined as the identity characteristics of the clinician, the clinical domain is defined as the expertise of the clinician, and the teacher domain is defined as the teaching role of the clinician. The results of the study showed that the personal domain was the most preferred in both groups. The second important result of the study was the scores for the clinician domain were higher in students' answers. The higher expectations of the students were discussed for the reason of higher scores [11].

In a study which aimed to understand the authenticity of feeling like a physician among clinical students, the relationship between clinical supervisor, patient, and student was one of the themes that emerged. Medical teachers play a crucial role in shaping authenticity for students by creating a positive environment for students and motivating them [12]. The student-centred approach contributes to creating a positive environment and motivating students by taking students' needs into the centre [4]. It's important to understand the crucial role of medical teachers by exploring approaches to teaching of medical teachers.

Clearly, the improvement of clinical education is based on understanding conditions in the clinical environment. An understanding of the clinical environment will be one part of the needs assessment for the faculty development program [13]. The determination of the approaches of clinicians as medical teachers is one of the components of needs assessment. So, it can be said that there is a need to explore the teaching approaches of medical teachers. In addition to this, there is not any previous research about determining the teaching approaches of medical teachers in our country. This research will contribute to determining and identifying the teaching approaches of medical teachers in Karadeniz Technical University Medical School. The results of our study would contribute to quality of clinical education in other medical faculties.

The aim of the study is: to determine and identify approaches to the teaching of medical teachers in a university hospital. The sub-questions are:

1) How do clinicians identify themselves as a medical teacher (or in a teaching role)?

2) What are the perspectives of medical teachers in clinical education?

To answer the research questions, this research paradigm is based on constructivism theory. According to the constructivist perspective, reality occurs from human interactions. Reality cannot be understood without human interactions and subject-object relations [14]. So, the answers to the research questions can only be explored by understanding the perspectives and experiences of medical teachers. The interaction between medical teachers and students is one of the content which needs to be understood to improve clinical education [15].

Materials and Methods

The methodology of the research is qualitative research. The educational case study method was used to develop an in-depth understanding of medical teachers' teaching approaches in a university hospital [14, 16]. The individual in-depth interview method was used to understand medical teachers' perspectives. Hennink et al. argue that meaning saturation should be the criteria for ending individual in-depth interviews instead of data saturation [17]. In our research, we targeted to reach both data and meaning saturation in interviews. The individual in-depth interviews were held in 9 months period 2021-2022.

There is a national core curriculum for medical schools in Türkiye. There are 128 medical schools in Türkiye and 45 of them are accredited [18]. All medical schools are trying to improve their curriculum and teaching methods according to the national core curriculum. There are nearly 200 faculty members at Karadeniz Technical University Medical School and half of them are in clinics. The Karadeniz Technical University Medical School is an accredited medical school and still trying to improve undergraduate medical education according to Harden's integration ladder [15]. The level of integration in Karadeniz Technical University Medical School is temporal coordination similar to other medical schools in Türkiye.

We were expecting to understand the meaning of being a medical teacher, the related factors with teaching, and their best experiences of teaching. The individual in-depth interviews were held until the data got saturated. [19].

Sampling

There are almost 200 faculties in both basic sciences and clinical departments at Karadeniz Technical University Medical School. The 100 of them are responsible for clinical teaching. The ratio of junior faculty to senior faculty is nearly %50.

The Interviews

One author held the individual in-depth interviews and an audio record was taken.

The individual in-depth interview questions were:

1. What kind of health service do you provide in the clinic?

-Can you give information about your experience as a clinical teacher?

2. What training do you provide to medical

students in the clinic?

3. What does it mean to you to be an educator in the clinic?

4. Think about your educational experience. What was your most effective educational experience?

- Why do you think this experience was effective?

5. Are there any components that you consider in the clinical training process specific to your field? For example, do you have a special approach to the training, or do you use a specific method?

6. How do you think clinical training should be?

7. Is there anything else you'd like to share about clinical training?

Data Analysis

The six-step process is defined for the thematic analysis: familiarizing with the data, generating initial codes, searching for themes, reviewing the themes, defining the themes, and reporting [20]. One author both held the interviews and transcribed the interviews, the other two authors contributed to coding and deciding themes to ensure rigour in the study. Each author coded the same transcript individually. Then three of them discussed, negotiated, and agreed on codes and the analysis was completed according to these codes and the themes emerged from the agreed codes. All analyzing processes were held manually.

One of the limitations of the study is that the time is needed for conducting interviews effectively. As the participants of our study are clinicians, they have a very busy schedule and completing interviews without any interruptions was the biggest challenge in the data collection process.

Ethics Statement

The present study protocol was reviewed and approved by the Karadeniz Technical University of scientific research ethical committee (approval no. 2021/3). Informed consent was submitted by all subjects when they were enrolled. The research was conducted according to Helsinki Declaration and researchers have complied with Helsinki Declaration.

Results

Nine individual in-depth interviews were held with medical teachers. The most experienced medical teacher has 27 years of experience and the junior one has 6 months of experience. The ages of the participants were varied between 40 and 65. There were 5 female and 4 male participants in the study. Three of the participants were from surgical departments and 6 of them were from internal medicine and pediatrics departments. There were both seniors and juniors in each department group. All participants had clinical experience before their academic careers. They had the role of being peer educators to their colleagues but none of them had the role of being a medical teacher before being an academician. The basic training trainers program was held regularly in the medical school according to the accreditation criteria for 15 years and they all attended the basic training trainers program at different times.

Emerged themes

Three main themes have emerged. 1-the issues at clinical education, 2-teachers' perspectives on clinical education, and 3 the roles of students and teachers in clinical education.

1-The issues in clinical education

The limitation of standardization of education for each student is the major finding for this theme.

"When there is a positive finding with a patient, I let the students examine the patient. But of course, it's not the same every day. Our clinical education is completely dependent on patients at clinics that day." Senior 1

"I'm not doing anything structured, of course." Junior 1

"Each faculty member teaches in his/her own way and background. Maybe this situation adds richness, but without standardization, I wonder if some things are missing in the students." Junior 1

"I structured a role-play in clinical education. I play the patient's mother and students take history from me. But of course, this is something I do. I don't know how other medical teachers do." Junior 2

"My expertise field doesn't match with undergraduate medical education. So I structured an algorithm and I am teaching what may be important to students after graduation. Not all students have a session with me, but I do everything for whose having." Senior 2

"However, since this method does not continue after me, I don't know the effects of what I've teach. The education should keep continue and in the same way." Senior 3

Most of the participants stated that nurses, residents, peers etc are the components of clinical education in addition to medical teachers.

"The residents and nurses also teach students. We have limited time with students, so they get support from residents and nurses. I don't know what exactly they teach to students." Junior 1

"They can also learn something from the assistant or nurse in the clinics." Senior 4

The high number of students and the context are stated as the barriers to well-structured clinical education.

"Because the patient rooms are also very small, we can't breathe inside if we are more than 5 people." Junior 1

"I ask for 2 or 3 students in each rotation. It becomes impossible to learn when they're more than 3." Senior 4

Especially the junior participants emphasised the importance of training-trainer programs.

"I was a very novice when I just started it, no one said "do this and do that". So I discovered how to teach by myself." Junior 1

"Since I am a beginner, I am not experienced in teaching, the teacher must be very well equipped scientifically. Training begins in the teacher." Junior 3

Most of the participants stated that the ideal clinical education is generally based on students' engagement and the mentorship method.

"Clinical education should be one-to-one training, we should give feedback to the student,.." Senior 4

"The basic needs, mental state and well-being of the student should be met." Senior 1

2-Teachers' perspective on clinical education

Most of the participants stated that prior knowledge is important for effective clinical education.

"There is a structured theoretical training for clinical-year students in our clinic, they need to learn the theoretical background of diseases before they interact with patients" Senior 5

"With lack of theoretical background, you train something like a technician, a robot. Students must first know what they are doing and why. The students need to evaluate themself." Senior 1

Most of the participants stated that they see clinical education as an opportunity for improvement.

"It should be able to mutual. It should also feed the academician" Senior 5

"I see my gaps when I teach young people something." Junior 2

All participants stated that they love teaching for the greater good. That's the reason for being an academician.

"*It is a task that I enjoy doing the most individually and that I take on myself to contribute to the future of the country." Senior 3*

"I love being an educator. I think this is the biggest factor in my coming to the academy." Junior 1

Definitions of their teaching style differentiate between juniors and seniors.

"I'd like to teach until they learn." Senior 2

"I have limited time and I can only support them to learn at limited time." Junior 2

"There should be experiential learning and interactive training with questions and answers" Junior 4

They describe the best teaching experience as receiving questions from students, teaching in a structured way and understanding the learning outcomes that students gain at that session.

"When students ask about the topics after the session, I feel that I achieved to teach them something." Senior 5

"Teaching according to the guidelines, so I can be sure that I gave all the students what they need." Senior 3

"When the students integrated the patients' examination signs with the knowledge from our discussions, I saw the students embodied the knowledge." Junior 1

3-Students' and teachers' roles in clinical education

One of the statements was the need to improve students' motivation. The senior participants were more focused on students' knowledge, the junior participants were more focused on students' motivation and learning environment.

"It's important to support students' engagement. I'm doing question-answer in clinical training. So the students come prepared for my training. I don't get angry when they can't answer questions and I explain the answer to them." Senior 4

"They want to get to something as the crow flies. They do not any problem with listening but they postpone everything without any effort no matter whether they learn or not. They may need to be more curious." Junior 2

"When we leave the patient's room, they can't even say what I told them one minute ago, because they don't listen and they don't care. I wish the students were asking about the cases, did not wait for us to tell all the time." Senior 1

"When some of the students are unenthusiastic, I tell them to watch their friends and learn something from their examination, but unfortunately most of them are watching out the window during clinical education" Junior 1

"I ask questions and the students know that. So they study to answer my questions." Junior 4

"Unfortunately, there is also status in society, and they feel more comfortable while asking questions because I am a junior." Junior 2

Most of the participants stated that they expect students to ask questions to medical teachers. Generally, the participants try to motivate students to participate in discussions by asking them questions and insisting on getting answers from them if the students don't ask questions. Although the participants have a strong opinion about motivating students none of them have a clear explanation of how should they motivate the students. The ways to motivate students differed among participants. While one of the participants stated that she asks questions to motivate students, the other one stated that he doesn't let the questions because he already teaches everything the students need to know.

"I am waiting for them to ask questions. They should ask questions to teachers. I start asking questions when they do not. I don't know what to do else at that point." Senior 5

"I try to motivate them, I say "don't hesitate to answer, if it is wrong, nothing will happen, " Senior 1

"It is not a process that requires question and answer, I am drilling what they need to know to them." Senior 4

"It is the responsibility of the teacher to establish balance and create a comfortable environment for everyone. That's why I talk, I chat, so that everyone can have a rhyme. Then I start asking questions because they should know the answers already what I asked for." Junior 3

"Teacher we have never seen a patient, we are very afraid of seeing patients, can you teach us," they asked after the pandemic. Then the light in those students' eyes made me very happy. I expect students to ask me for support like that" Junior 1

"This place is there for learning, you will do it wrong, you will say wrong, and it's okay. Say whatever comes to your mind. That's how I try to motivate them. Of course, I am waiting for them to know the basics of patient care" Junior 1

Discussion

We structured the discussion through emerging themes: issues in clinical education, teachers' perspectives on clinical education, and the roles of students and teachers in clinical education. The findings show that clinical teachers are mostly keen on being teacher-centred. Even the junior ones who try to encourage students to improve interaction, the lack of medical teachers encouraging students to be involved the clinical education is the biggest barrier to student-centredness. The medical paternalist approach as a personal attitude of the clinicians may be one of the reasons for this barrier. The studies in our country show that the paternalist approach still has an undeniable effect on clinicians [21,22]. The

paternalist approach of the clinicians may cause the teacher-centred approach in the clinicians' teaching role.

The Issues in Clinical Education

A clinical environment is one of the most powerful places to transform theoretical knowledge to practice [23]. Situational learning also defines the culture of the clinical environment as one of the indicators for learning [24]. Our study shows students learn from medical teachers, residents, nurses, and peers in the clinical context. So, improving the learning culture in the clinical environment will contribute to clinical education.

Another discussion on learning from nurses, residents, and peers is they are in the hidden curriculum and there is not any structured training the trainer programs for them. Although there are different learning resources in the clinical context, only the medical teachers take the training trainers course and it's a 5-day course. So, a well-structured training trainer program for clinicians, nurses and residents will improve learning in clinical environments [25]. The implementation and improvement of training trainer programs for all parties who are involved in clinical education can contribute to improving the quality of clinical education by structuring one part of the hidden curriculum.

The findings show that junior clinicians feel the limitations of structured mentorship programs. Because of the limitation of training trainer programs junior clinicians need to ask "how to teach" their seniors. Education in clinical environments is one of the examples of situated learning in health professions education [24]. As a component of situated learning, the communities of practice approach contributes to medical teachers' gaining competency in clinical education [24]. To improve the communities of practice component of clinical education faculty development programs should be developed and implemented.

One of the issues is the limitation to standardize clinical education for each student. The use of well-structured algorithms and guidelines is the recommendation to standardize clinical education for high-quality teaching [26]. The limitation to reaching the same type of patients is one of the barriers to the standardization of clinical education. The implementation of simulation-based education in clinical years contributes to ensuring standardization of the clinical education.

Teachers' Perspectives on Clinical Education

Medical teachers have the responsibility for patient management and the needs for this management [27]. The limitation of time is one of the barriers to effective clinical education. To handle this barrier, medical teachers tend to act faster and expect students to have prior knowledge [28]. They expect students to be ready for clinical education, otherwise, they think the effectiveness of clinical education would be limited. These views of medical teachers should also be taken into account in terms of clinical ethics. Because the students' readiness for clinical education also helps them to recognize ethical issues. Especially in the clinic, it may be necessary to make quick decisions in some ethical dilemmas. Being ready for clinical training is a prerequisite for correct ethical reasoning.

Being a physician for the greater good can be exhausting and cause burnout [29]. In our study, all participants mentioned they become an academician for the greater good. Teaching for the greater good is the motivation to keep them engaged with clinical education in our study. Teaching may be the way of coping with burnout during patient care.

There are structured algorithms for clinical education. One of the recommendations for clinical education is tracking patient care outcomes [26]. In our study participants emphasize that they expect to see the students' competencies in clinical education. Tracking patient care outcomes and conducting discussions with the students on this topic would contribute to seeing students' competencies.

The Roles of Students and Teachers in Clinical Education

Teacher identity is how teachers define themselves as a teacher, how they're attached to their teaching role, and what kind of teacher style they think [3]. Studies carried out in Türkiye are similar to the views expressed in Western countries about

the role and responsibilities of medical teachers. In Türkiye, medical teachers are expected to act ethical and fulfil their responsibilities as trainers [10]. The positioning theory addresses the social interaction and changes in the role of the clinician as a teacher, mentor, assessor etc. [30]. The challenge is clinicians have different perspectives on their teaching role. Some of them feel their priority is patient care, while others feel their priority is research or teaching. These different feelings have an impact on the professional identity of medical teachers [3]. So, it seems to be important to find ways for transform this difference into substantiality. There are different ways that medical teachers define their role in clinical education [2]. Medical teachers' define their roles as "helping students" to gain clinical competencies in our study. Teachers are positioning themselves as an authority with the responsibility of teaching students. All participants have their own style of "helping students" like as asking questions, giving tasks to complete, transferring knowledge etc. Students in clinical education need to take part in the clinical context, participate in patient care, and be active in social interactions to excellence in learning [31]. Situated interest is defined as an effective response and engagement in a learning activity [32]. Our study shows medical teachers are expecting students to be active in their learning and have the motivation to examine the patients. The medical teachers are expecting the students to have a high level of situated interest. However, increasing students' situated interest is up to their prior knowledge of the context, the characteristics of the learning activity, the learning environment, and the approach to the teaching of medical teachers. One of the roles of the medical teacher is to structure a learning activity which triggers students' situated interest. The structure of the learning activity needs to be appropriate to students' backgrounds and it should be the optimum level of difficulty to allow students to accept the learning challenges [32]. It seems the medical teachers' approach to teaching should be considered as one of the motivating factors in clinical education. So, it needs to be structured to contribute to students' motivation.

Conclusion

This study showed the characteristics of the teaching approaches of medical teachers. One of the major findings of the study is the approach to teaching of medical teachers has an effect on clinical education in our country. The perspectives of junior and senior participants should be considered as a resource for improving the quality of clinical education. Also, this research will enlighten the needs assessment to develop an effective faculty development program. Still, further studies are needed including all stakeholders of clinical education: students, nurses, residents etc.

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Conflict of interest

The authors declare there is no conflict of interest.

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ORIGINAL ARTICLE

The effect of thanatophobia and professional commitment on compassion fatigue in nurses in Türkiye: Cross sectional study

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Abstract

The study was executed as cross-sectional to unearth the effect of thanatophobia and professional commitment on compassion fatigue in nurses in Türkiye. This study is cross-sectional. 521 nurses were reached by using the regional stratified method. Data were collected online via Google forms between July and November 2021.Data were obtained with the Sociodemographic and Occupational Characteristics Questionnaire, the Compassion Fatigue Short Scale, the Thanatophobia Scale and the Scale of Commitment to the Nursing Profession. Data were evaluated using the number, percentage, mean, standard deviation, t-test, One way ANOVA, and using correlation and regression analysis. The mean age of the nurses was 32.22±7.51. Nurses acquired a moderate score on the Compassion Fatigue (64.63±30.89), Thanatophobia (30.69±12.26), and Professional Commitment (67.66±14.33) scales. Thanatophobia predicted Compassion Fatigue at a rate of 41.2% in terms of providing care to a terminally ill patient and thinking about quitting the profession in the near future. Nurses acquired a moderate score on the Compassion Fatigue, Thanatophobia and Professional Commitment scales. It is recommended to evaluate Compassion Fatigue, Thanatophobia, and Professional Commitment in nurses regularly, to provide training for nurses who cared for patients who have fear of death or who have died, to rotate nurses working in this field, and to strengthen the collaboration among employees to increase their commitment to the profession.

Keywords: Nurses, compassion fatigue, thanatophobia, professional commitment

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Introduction

The primary service providers of healthcare are nurses, and in today's rapidly aging population and changing environmental conditions, along with the pandemic and chronic illnesses, due to escalating costs more than ever before, nurses are engaged in demanding treatment processes and high-skill care activities for patients as part of their duties. Nurses are exposed to witnessing the fear, helplessness, stressful, and traumatic experiences of patients and their families, and they are required to establish long-term therapeutic relationships, which subjects them to increased stress and the risk of compassion fatigue. Compassion Fatigue (CF) is the phenomenon of stress resulting from exposure not to the trauma itself, but to an individual who has undergone trauma [1]. Figley (1995), the first to define CF in an academic sense, identified CF as "a state of biological, physiological and emotional exhaustion and dysfunction as a result of prolonged exposure to compassion stress" [2]. Regardless of the reason, nurses experience negative emotions when they are unable to relieve pain, which can lead to CF [3]. Considering the studies conducted in Türkiye, there are studies indicating low or above-average CF [4,5]. Dikmen et al. (2016) stated that 52.7% of intensive care nurses were at high risk for CF [6]. Jakimowicz et al. (2018) [3] studies unearthed that CF was associated with many factors such as being new in the profession, the type of work institution (private or public), and work experience. In the same study, a correlation was found between burnout and CF. Additionally, nurses can experience CF due to the helplessness they feel when exposed to sudden changes in patients' health conditions and deaths [2].

Thanatophobia, a type of fear found in most people, refers to the fear of the end of human life, and it differs from other fears as it is quite overwhelming. The fear of death has great effects on human life; this effect can cause pathological problems and may require one to seek medical support [7]. Nurses are health workers who play a key role in the operation of health care services. Nurses, who undertake the care and treatment of dying patients, often experience the phenomenon of death [8]. The death, suffering, and pain of others cause a variety of emotions in all individuals, more commonly in health care workers, and the most frequent ones are fear and anxiety [9]. During COVID-19 pandemic, such traumatic events have increased the fear of death and anxiety in nurses [10] and this situation can cause feelings of guilt, helplessness, anger, and depression [8]. The fear of death forms the basis of all types of anxiety and fear as well [11]. In a study conducted by Özyalçın and Çevik (2021) [12] in which thanatophobia of patients, patient relatives, and nurses was compared, it was found that the fear of death and death avoidance behaviors were higher in the latter than in patients and their relatives. It was concluded that nurses who works in the intensive care units experience thanatophobia intensely and also that thanatophobia level rises in women, individuals with an associate degree, who are not satisfied with their profession, and those witnessed death [13]. On one hand, nurses bear witness to patients' pain and death, confronting their own fears of death. Sudden deaths or challenges experienced during the dying process can evoke emotional responses such as fear, anxiety, and stress in nurses. This situation can impact professional commitment and diminish nurses' emotional engagement with their work.

Professional commitment (PC) is defined as the compliance between beliefs of an individual and their professional goals; higher compliance leads more personal effort. PC consists of three factors: the belief in the values of the chosen profession, an effort to understand these values, and the determination of maintaining professional standards. There are many factors affecting PC, such as working conditions, work-family conflict, sociodemographic characteristics (age, gender, marital status, etc.), and organizational barriers [14]. It is thought that professional and family responsibilities and various physiological and psychological negative conditions, especially during the pandemic process, increase the perception of organizational blockage and decrease professional commitment, which may accelerate the quitting process of health workers [14,15].

There is not a single study in national and international literature has investigated the

effects of thanatophobia and professional commitment on compassion fatigue in nurses. This study is believed to fill a gap in the literature by identifying the levels of compassion fatigue, thanatophobia, and professional commitment among nurses, as well as determining the factors influencing compassion fatigue. Therefore, the aim of the study is to determine the effects that thanatophobia and professional commitment have on CF in nurses in Türkiye.

Research questions:

- What are the levels of CF among nurses in Türkiye?
- What are the levels of Thanatophobia among nurses in Türkiye?
- What are the levels of PC among nurses in Türkiye?
- How do factors such as professional characteristics, PC, and Thanatophobia affect CF in nurses in Türkiye?

Materials and Methods

Aim

The aim of this cross-sectional study is to demonstrate the effect of Thanatophobia and PC on CF in Nurses in Türkiye.

Population-sample

The population of the research consisted of 198,103 nurses registered in the Regional Statistical Data System of the Turkish Statistical Institute (TurkStat) in 2019 [16]. There are 7 regions and 81 provinces in Türkiye. For this reason, the size of the sample included in the study was calculated as a minimum of 383 nurses, with a confidence level of 95%, a confidence interval of 5%, and a sampling error of ±5% for the non-homogeneous population where the regional stratified method was used. The study was completed with the participation of 521 nurses. The strata ratio was calculated by dividing the number of nurses, for instance it is 57,342 for the Marmara region, by the total number of registered nurses (57.342/198.103=0.289). The number of nurses that needed to be reached in each region was determined by multiplying the calculated strata ratio with the total number of samples to be reached (0.289x383=110). The sample sizes for all regions were calculated as demonstrated in the example and are presented in Table 1.

Data Collection Tools

Sociodemographic Characteristics Questionnaire: The form designed by researchers in line with literature and consists of 12 questions regarding sociodemographic characteristics [8,14,17-19].

Occupational Characteristics Form: The form designed by the researchers in line with literature and consists of 9 questions regarding occupational characteristics [8,14,19].

Compassion Fatigue-Short Scale (CF-SS): The CF-CS scale, developed by Adams et al. (2006) [17], was used in the study to measure the CF level of healthcare workers. The validity and reliability of the scale in Turkish were conducted by Yıldırım and Cavcav (2020) [19]. The scale consists of 13 items, representing the sub-dimensions of secondary trauma and burnout. Each item is scored on a scale from 1 to 10 (1: rarely/never, 10: very often). The secondary trauma sub-scale includes items 3, 5, 8, 10, and 12, while the burnout sub-scale includes items 1, 2, 4, 6, 7, 9, 11, and 13. There is no specific cut-off point for the scale. Scores on the scale can range from 13 to 130, indicating higher CF levels as the scores increase [19]. The original scale and Cronbach's alpha coefficients for this study are presented in Table 4

Thanatophobia Scale (TS): Turkish validity and reliability of the TS, which was developed by Merrill et al (1998) [20], was conducted by Çiftçioğlu and Harmancı Seren (2019) [8]. The scale consists of seven items and a seven-point Likert scale. The scale items were scored from 1 to 7, starting from the "strongly disagree" category to the "strongly agree" category. The increase in the mean score on the scale indicates that the death fear of the individual has increased as well [8]. Original scale and The Cronbach alpha coefficients for this research are presented in table 4.

Professional Commitment Scale (PCS): The scale was developed by Lu et al. (2000) in order to determine the level of PC of nurses [21]. Turkish validity and reliability of the study was

conducted by Çetinkaya and Ozmen (2015) [18]. The scale consists of 26 items and 3 subscales: The Cronbach alpha value was 0.94 in the original version and 0.90 in the Turkish validity and reliability study. The scale is a four-point Likert type scale (1: Strongly disagree - 4: Strongly agree) and consists of 9 reverse-scored items (14, 15, 16, 17, 18, 19, 20, 21 and 25). While the total scale score ranges from 26 to 104, a higher score indicates higher professional commitment. There is not a cutoff point for the scale [13,21]. Original scale and The Cronbach alpha coefficients for this research are presented in table 4.

Data Collection

Data were collected online via Google forms between July and November 2021. Researchers reached out to nurses by sharing the online survey link on their social media accounts (Facebook, Twitter, Instagram, WhatsApp). In the online survey, information of the institution and identity of the nurses participating in the research were not questioned. In the study, nurses were reached through convenience sampling method. Google form is set so that participants can not submit without answering questions. Participants could not move on to the next without answering the questions and the section. The privacy and confidentiality of personal data were protected by being encrypted in Google forms. Only the researchers had access to the obtained data.

Statistical Analysis

The data obtained in the study were analyzed by the researchers using the SPSS (Statistical Package for Social Sciences) 20.0 package software program on computer. For the purpose of data analysis, numbers, percentages, minimum and maximum values, mean and standard deviations are given determined according to a normality distribution analysis of the data (using the skewness and kurtosis − 1.5 to +1.5 coefficients) [22]. To determine the differences between groups, t-test analysis, and one-way variance test (ANOVA) were used for normally distributed variables; and the Mann Whitney-U and the Kruskal Wallis H analyses were used for non-normally distributed variables. Correlation and linear regression analyses were applied to determine the correlation and effect between the data. in the statistical analyses, the level of significance was accepted as $p<0.05$.

Research Strengths and Limitations

The limitations of the study are that the research was conducted online and that the results can only be generalized to the participants who had internet access and agreed to participate in the study. The environment in which the research was conducted and the profile of the participants are limited; therefore, it should be noted that the findings may be generally confined to nurses in Türkiye. All measurement tools used in the study may not accurately reflect individuals' expressions or comprehensively assess their emotional states

Research Ethics

This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee of Kafkas University (09.06.2021/81829502.903/197). Permission was received from the authors who developed the measurement tools used in the research. It was stated to the individuals who will participate to the research that data to be gathered from the research would only be used for scientific purposes, and that they could desist the research at any time they want. The first page of the online questionnaire was the consent page that participants were asked whether they agreed to participate in the study or not. While the participants who agreed to participate in the study were allowed to proceed to the next page of the online questionnaire; those who did not agree to participate were not allowed to proceed to see the questions. Identities of the researchers were also provided on the first page of the questionnaire.

Results

Five hundred and twenty-one nurses working in different geographical regions of Türkiye participated in this study.

Of the nurses participating in the research, 69.7% were female, 56.8% were married, 89.8% had children, 21.5% lived in the Marmara Region, 74.9% lived in a province, 89.4% had a middle income, 59.7% did not use any substance,

87.1% had an elementary family, 62.2% had a bachelor's degree, and 84.1% did not have any chronic disease. The mean age of the nurses was 32.22±7.51, and the average working year was 10.01±8.73 (Table 2).

53.4% of the nurses worked in a secondary health institution and 74.9% worked as unit nurses. Additionally, 89.1% of the nurses stated that they provided care to terminally ill patients; 93.5% stated that they intervened in the deceased patient; 63% stated that they were not satisfied with their profession; 81.6% stated that they would choose a different profession if they had the chance; and 66.4% thought of quitting the profession soon (Table 3).

Table 1. Sample Size According to Regions.

Region	Population	Strata ratio	Min Sample size (confidence interval of 5%)	Number of participants
Marmara Region	57342	0.289	110	112
Aegean Region	25059	0.126	48	77
Mediterranean Region	24822	0.125	48	76
Central Anatolia Region	37063	0.187	72	72
Black Sea Region	21741	0.110	42	67
Southeastern Anatolia Region	16858	0.086	33	61
Eastern Anatolia Region	15218	0.077	30	56
Total	198103	1.000	383	521

Table 2. Distribution of Demographic Characteristics (n=521).

		n	%
Gender	Male	158	30.3
	Female	363	69.7
Marital Status	Married	296	56.8
	Single	225	43.2
Children (308)	No	53	10.2
	Yes	468	89.8
Region of residence	Marmara Region	112	21.5
	Mediterranean Region	77	14.8
	Eastern Anatolia Region	76	14.6
	Central Anatolia Region	72	13.8
	Black Sea Region	67	12.9
	Southeastern Anatolia Region	61	11.7
	Aegean Region	56	10.7
Place of residence	Province	390	74.9
	District	131	25.1
Income	Low	44	8.4
	Middle	466	89.4
	High	11	2.1
Substance use	Nonuser	311	59.7
	Cigarette	187	35.9
	Cigarette and/or alcohol	23	4.4
Family structure	Nuclear	454	87.1
	Extended	58	11.1
	Fragmented	9	1.7
Education	High school	33	6.3
	Associate degree	89	17.1
	Bachelor's	324	62.2
	Postgraduate	75	14.4
Chronic disease	Yes	83	15.9
	No	438	84.1
Age	32.22±7.51 (Mean±SD)	0-56 (Min-Max)	
Work Experience	10.01±8.73 (Mean±SD)	0-133 (Min-Max)	

The average scores of the nurses for the various scales were 64.63±30.89 for CF-SS (CF-SS subscales: trauma 23.66±12.51 and occupational burnout 35.18±16.77), 30.69±12.26 for TS, and 67.66±14.33 for PCS respectively (Table 4).

The mean *Thanatophobia* scores of nurses who worked as head and unit nurses in a secondary health institution, those who provided care to the terminally ill, those who were not satisfied in their profession, those who would choose a different profession if they had the chance to do so, and those who thought of quitting the profession were higher and statistically significant (Table 5).

The mean *Professional Commitment Scale* scores of the nurses who worked as head nurses and those who were satisfied with their profession were higher and statistically significant (Table 5).

The mean *Trauma* scores of the nurses who worked as head nurses and unit nurses, those who provided care to terminally ill patients, those who intervened in the deceased patient, those who were not satisfied in their profession, those who would choose a different profession if they had the chance to do so, and those who thought of quitting the profession were higher and statistically significant (Table 5). The mean *Occupational Burnout* and *CF-SS* scores of the nurses who worked in secondary health institutions, those who were head and unit nurses, those who provided care to terminally ill patients, those who intervened in deceased

Table 3. Distribution of Occupational Characteristics (n=521).

		n	%
Institution	Primary health institution	50	9.6
	Secondary health institution	273	52.4
	Tertiary health institution	198	38.0
Position	Unit nurse	390	74.9
	Head nurse	41	7.9
	Other	90	17.3
Giving care to the terminally ill patient	Yes	464	89.1
	No	57	10.9
Interference to deceased patient	Yes	487	93.5
	No	34	6.5
Being satisfied with the profession	Yes	193	37.0
	No	328	63.0
Choosing a different profession if possible	Yes	425	81.6
	No	96	18.4
Thinking of quitting the profession soon	Yes	346	66.4
	No	175	33.6

Table 4. Distribution of Participants' Mean Scores on CF-SS and its Subscales, TS, and PCS and Internal Consistency (n=521).

	Minimum	Maximum	Mean	Std. Deviation	Cronbach α	Cronbach α
Trauma	5.00	50.00	23.66	12.51	0.80†	0.89
Occupational burnout	7.00	69.00	35.18	16.77	0.90†	0.92
CF-SS total	**13.00**	**129.00**	**64.63**	**30.89**	**0.90†**	**0.95**
TS	**7.00**	**49.00**	**30.69**	**12.26**	**0.85‡**	**0.94**
PCS total	**26.00**	**107.00**	**67.66**	**14.33**	**0.94§**	**0.86**

†: Cronbach alpha of the original scale [17]

‡: Cronbach alpha of the scale adapted to Turkish [8]

§: Cronbach alpha of the scale adapted to Turkish [18]

patients, those who were not satisfied in their profession, those would choose a different profession if they had the chance to do so, and those who thought of quitting the profession were higher and statistically significant (Table 5).

It was concluded that there was a positive, weak, significant correlation between the mean TS score of the nurses and their mean scores on CF-SS trauma, the occupational burnout subscales, and the CF-SS (Table 6; $p<0.005$).

The results of the stepwise multiple linear regression analysis performed to examine the variables associated with PC is presented at Table 7. According to the results of the analysis, 41.2% of the variables of TS, providing care to terminally ill patients, and thinking of quitting the profession soon in the model explain CF.

Table 5. Distribution of TS, PCS, CF-SS, and subscale scores according to occupational characteristics.

		TS	PCS total	Trauma	Occupational burnout	CF-SS total
		X± SD	**X± SD**	**X±SD**	**X±SD**	**X± SD**
Institution	Primary health institution	3.47±1.71[c]	2.51±.62	4.28±2.52	4.55±2.42[c]	4.49±2.39 [c]
	Secondary health institution	4.69±1.71[a*]	2.64±.56	4.91±2.45	5.31±2.32[a*]	5.22±2.29[a*]
	Tertiary health institution	4.18±1.71 [b]	2.56±.50	4.59±2.55	4.75±2.43[b]	4.74±2.45 [b]
	***p* value[1]**	***p*<0.001**	*p*=0.101	*p*=0.157	***p*=0.015**	***p*=0.037**
Position	Unit nurse	4.44±1.74[b]	2.59±.53[b]	4.86±2.48[b]	5.17±2.36[b]	5.12±2.34[b]
	Head nurse	4.96±1.60[a]	2.87±.48[a*]	5.31±2.63[a]	5.54±2.40[a]	5.51±2.44[a]
	Other	3.84±1.74[c*]	2.52±.59[c]	3.91±2.37[c*]	4.13±2.31[c*]	4.07±2.28[c*]
	***p* value[1]**	***p*=0.001**	***p*=0.002**	***p*=0.002**	***p*<0.001**	***p*<0.001**
Giving care to the terminally ill patient	Yes	4.44±1.77	2.60±.55	4.93±2.50	5.22±2.39	5.17±2.36
	No	4.89±1.78	2.58±.54	3.07±1.75	3.43±1.73	3.33±1.72
	***p* value[2]**	***p*=0.025**	*p*=0.848	***p*<0.001**	***p*<0.001**	***p*<0.001**
Intervening in the deceased patient	Yes	4.42±1.72	2.60±.55	4.80±2.49	5.09±2.37	5.04±2.34
	No	3.85±2.00	2.54±.53	3.70±2.38	3.97±2.44	3.89±2.39
	***p* value[2]**	*p*=0.046	*p*=0.017	***p*=0.013**	***p*=0.008**	***p*=0.006**
Being satisfied with the profession	Yes	3.97±1.74	2.73±.51	3.74±2.07	3.82±2.09	3.83±2.04
	No	4.62±1.71	2.52±.55	5.31±2.55	5.73±2.28	5.64±2.30
	***p* value[2]**	***p*<0.001**	***p*<0.001**	***p*<0.001**	***p*<0.001**	***p*<0.001**
Choosing a different profession if possible	Yes	4.46±1.76	2.58±.55	4.88±2.51	5.24±2.36	5.18±2.35
	No	4.04±1.64	2.63±.55	4.05±2.34	4.04±2.29	4.04±2.28
	***p* value[2]**	***p*=0.035**	*p*=0.536	***p*=0.003**	***p*<0.001**	***p*<0.001**
Thinking of quitting the profession soon	Yes	4.69±1.70	2.57±.57	5.48±2.42	5.84±2.25	5.77±2.24
	No	3.77±1.68	2.65±.49	3.25±1.92	3.40±1.74	3.39±1.76
	***p* value[2]**	***p*<0.001**	*p*=0.150	***p*<0.001**	***p*<0.001**	***p*<0.001**

[1]One-way ANOVA test [2] Independent samples t-test **A>B>C** ***Significant Difference-Creating Group

Table 6. Correlation between participants' scores on CF-SS, its subscales, TS, and PCS.

		TS	PCS total	Trauma	Occupational burnout	CF-SS total
TS	**r**	1	0.239**	0.463**	0.462**	0.481**
	p		**<0.001**	**<0.001**	**<0.001**	**<0.001**
PCS	**r**	0.239**	1	0.033	0.020	0.027
	p	**<0.001**		0.454	0.651	0.532
Trauma	**r**	0.463**	0.033	1	0.880**	0.952**
	p	**<0.001**	0.454		**<0.001**	**<0.001**
Occupational burnout	**r**	0.462**	.020	0.880**	1	0.980**
	p	**<0.001**	0.651	**<0.001**		**<0.001**
CF-SS total	**r**	0.481**	0.027	0.952**	0.980**	1
	p	**<0.001**	0.532	**<0.001**	**<0.001**	**-**

**p<0.001

Table 7. Linear regression analysis results of the dependent variable CF.

	Standardized β coefficient	Std. Error	Beta	t	*p*
(Constant)	20.412	7.041		2.899	**0.004**
PC Total Score	-0.017	0.078	-0.008	-0.223	0.823
TS Total Score	0.923	0.093	0.367	9.981	**<0.001**
Employment in the COVID-19 unit (No)	1.031	2.934	0.012	0.351	0.725
Giving care to the terminally ill patient (Yes)	-11.673	2.542	-0.183	-4.592	**<0.001**
Choosing a different profession if possible (Yes)	-4.014	3.079	-0.050	-1.303	0.193
Thinking of quitting the profession (Yes)	19.961	2.601	0.305	7.675	**<0.001**

R^2 = 0.412; F (8-512)=44.83; p<0.001; Durbin-Watson=2.007

Discussion

This study is considered important since there is not any study in Türkiye that investigated the effects of TS and PC on CF in nurses according to the region.

What are the levels of CF, TS, and PC of nurses?

When the studies conducted in Türkiye were examined, it was concluded that CF has been frequently evaluated with CF, one of the subscales of the Professional Quality of Life Scale-ProQOL-5 and that CF-SS has also been used in recent years. In this study, the mean CF-SS score was found to be 64.63±30.89 and it can be said that nurses had a moderate level of CF. Similar to this study, CF was found to be at low or moderate levels in previous studies conducted in Türkiye [23,24].

In this study, it was concluded that the mean TS score of the nurses was 30.69±12.26 and it was at a moderate level. Similarly, in a study conducted by Kösedağ (2021) [12], it was found to be 29.44±9.13. Likewise, in other studies conducted in Türkiye, nurses were found to have a moderate level of fear of death [25,26]. In studies conducted after the pandemic, it was determined that level of death fear of nurses was moderate or high [10,27]. According to the pre-pandemic and post-pandemic comparison, the fact that the fear of death increased due to the uncertainty experienced by nurses was an expected result.

In this study, it can be concluded that the mean PCS score of the nurses (67.66±14.33) was at a moderate level. Similar results were obtained in previous studies [28,29]. In a study conducted after the COVID-19 pandemic, it was stated that the PCS score of the nurses was at a moderate level [13,30]. On the other hand, there are studies stating that PC is at low or high levels among nurses [31,32].

How do factors such as occupational characteristics, PC and TS affect CF in nurses?

The mean CF-SS score was found to be higher in those nurses working at the secondary health institution and head nurses. CF is a natural consequence of caring for individuals who are sick or suffering. Other than that, it is also known as the stress of trying to help someone through a traumatic experience and who is important to the person trying to help. Especially during the COVID-19 pandemic, the increase in exposure of the secondary health institution workers to traumatic events, the exposure of service personnel to traumatic events, and the difficulties in managing this process may have increased CF.

The mean CF score was found to be significantly higher in nurses who provided care to terminally ill and deceased patients. Similarly, in the study conducted by Ju Cho and Cho (2021) [23], it was stated that the CF score of the caregivers who provided end-stage care once a week was significantly higher. Yang and Kim (2016) reported that there is a significant correlation between work-related trauma and CF [33]. In particular, one of the factors affecting CF is that nurses are empathetic [34]. It can be said that CF increases due to the empathetic nature of nurses who provide care to terminally ill or deceased patients.

The mean CF-SS score was found to be significantly higher in those who were not satisfied in their profession, those who would choose a different profession if they had the chance to do so, and those who thought of quitting the profession. Likewise, in previous studies, CF was found to be high in those who did not choose the profession willingly [35]. Ju Cho and Cho (2021) [23] stated that those nurses who were not satisfied with the hospice unit had a higher CF score. Sung et al. (2012) [36] stated that there is a correlation between CF and intention to quit. It is known that there are significant changes in work performance, work-related attitudes and behaviors, and the personal health of nurses with CF [37]. On the contrary, burnout and high job stress also increase CF in nurses [36]. As seen in Table 6, the correlation between burnout and CF identified in this study also supports the literature.

In this study, the model established as a result of linear regression was significant whereas it was determined that the mean PCS score was not effective on CF-SS (Table 7). A similar study supports this result [38]. In another study, it was stated that monthly salary and colleague

relations strongly predicted CF in nurses [39]. Bell et al. (2019) stated that a positive work environment predicted whether CF would be present [40]. It can be said that the differences in these results are the result of the varying sample groups of the different studies.

In this study, more than half of the nurses (66.4%) thought of quitting the profession. In the regression model established in the study, 41.2% of CS showed significant results with the thought of quitting the profession. According to the study conducted by Baysal et al. (2022) with the participation of several nations, it was reported that almost one-third of the nurses (28.6%) thought of quitting the profession and that there was a significant correlation between the thought of quitting the profession and CS [41].

Conclusion

As a result of this study, it was determined that the nurses had moderate CF, TSa, and PC scores. Because of this reason, longitudinal studies should be conducted to evaluate CF among nurses, more emphasis should be given to the well-being of nurses, and preventive strategies and experimental studies should be planned.

41.2% of CF is explained by factors such as TS, provided care to terminally ill patients, and thinking of quitting the profession soon. 58.8% of CF is explained by other factors. Because of that phenomenon, it is recommended to provide training regarding the fear of death and care of deceased patients to nurses who provide care to deceased or dying patients, to ensure that nurses work in rotation, if necessary, to create institutional measures to increase PC, to ensure collaboration and empowerment among colleagues, and to take measures to reduce occupational burnout.

Implications for Nursing Practice

Considering that a safe and high-quality working environment affects the quality of care provided by nurses to patients, nurses should be supported against the risk of CF, and strategies to cope with this situation after the COVID-19 pandemic should be provided. Studies that include many nurses from different hospitals in Türkiye, that investigate CF and the affecting conditions, that are quantitative and qualitative to investigate the current situation and assist in taking the necessary measures will reduce CF, while it will increase the PC of nurses and the quality of care. Furthermore, this study will contribute to the investigation of other factors affecting CF.

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Conflict of interest

The authors have no relevant financial or non-financial interests to disclose.

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ORIGINAL ARTICLE

A study evaluating the relationship between phubbing levels and empathic attitudes of college students

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Abstract

The objective of this research is to investigate the relationship between phubbing levels and the empathy attitude of college students. In our descriptive and correlational study, data were gathered from 528 college students studying in the undergraduate program of a university in Eastern Türkiye. Personal information form, Phubbing Scale, and Empathic Tendency Scale were employed as data collection forms. The research's findings were examined using the SPSS 22.00 package program, and all analyses were judged significant if the p-value is less than 0,05 (p<0.05). The average total scores of the college students were found to be 42.77±19.09 on the Generic Scale of Phubbing (GSP) and 62.52±7.56 on the Empathic Tendency Scale (ETS). We found a significant difference between the mean phubbing and empathic tendency scores of college students and the number of book readings per week, the number of friends, and the meeting with friends weekly. The conclusion was that there was a strong negative and significant association between students' total mean scores on the ETS and GSP scales (r=-0.581, p=0.00).

Keywords: Empathic tendency, students, phubbing

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Introduction

This is the age of communication, and communication technologies are continuously changing [1]. Cell phones are undoubtedly one of the technologies that contribute greatly to human welfare. This device has turned into a sociocultural product that is widely used in human life [2,3]. The cell phone was initially marketed as a portable device that facilitated our daily lives. But soon after, due to its unconscious and excessive use, it irrevocably transformed the communication way between people [4].

Cell phones are regarded as an obstacle to social communication and interactions. Individuals use their cell phones to mingle and interact, but they also ignore individuals when they run into them because they use their phones to communicate with others. [4] This situation is called phubbing, a hybrid word of the words phone and snubbing (to ignore, humiliate) [1,4]. Phubbing defines the action of someone who looks at their cell phone in social settings and directs his attention to something else [1,3].

Empathy is a common psychological phenomenon in communication between people. Eisenberg and Strayer (1987) define empathy as the capability of an individual to understand others' emotional states and to express similar emotional experiences and emotional reactions to others. Empathy is an essential channel for the enhancement of individuals' health and social adaptation and functions as the basis for positive outcomes and moral development [5,6]. A high level of empathy enhances interpersonal relationships and promotes pro-social behaviors [7]. On the contrary, a low level of empathy leads to the externalization of aggressive behavior [5,8]. The research conducted by Przybylski and Weinstein (2012) also found a decrease in the empathy level perceived by individuals in conversations where there is a phone [9]. Shellenbarger (2013) indicated that being engaged with a cell phone during a chat decreases eye contact and decreases the feeling of emotional connection [10]. Nakamura (2015), however, reported that the sense of emotional connection will be lost in a conversation where the focus is on the smartphone [11].

During an in-person conversation, the association between the listener and the speaker is established and maintained with the help of non-verbal behaviors such as active listening, empathy, paying close attention, using body language accurately and effectively, and maintaining eye contact with the other individual. These non-verbal gestures are not seen when people show Phubbing behavior, which can cause distance and neglect between people [8,12]. This study aims to ascertain the effect of the phubbing level of college students on their empathy levels. We believe, based on the literature review, that there is an association between phubbing behavior and empathic attitudes. We propose the below hypothesis:

Hypothesis 1: Phubbing level is negatively related to empathic tendency behavior.
Hypothesis 2: Phubbing level is positively related to empathic tendency behavior.

Material and Methods

Purpose of the Study

This research used a descriptive and correlational design to investigate college students' phubbing behaviors and the impact of phubbing behaviors on their empathy attitudes. When the literature was scanned, no study was found examining the relationship between phubbing and empathic attitudes of university students. Therefore, it is thought that the results obtained from the sample determined for the study and the scales used will contribute to the literature. This descriptive and correlational research was carried out in line with the STROBE checklist.

Target Population and Sampling for the Study

The target population of the study consisted of students studying in the undergraduate program of a university in Eastern Türkiye. Also, the sample of the research comprised 528 students determined by power analysis with a confidence interval of 0.95, a bias level of 0.05, an effect size of 0.3, and a population-representative power of 0.95. Only those students who conformed to the criteria of inclusion, were willing to enroll in the study, and gave a written consent form (N=424) were enrolled in the research. The response rate of the study was 80%.

The inclusion requirements for the study were (1) students attending an undergraduate program, (2) having a smartphone, (3) volunteering to enroll in the study, and submitting a consent form. Not freely accepting to participate in the study and not having a smartphone were the two requirements for exclusion.

Data were gathered from the students using the online data collection technique via the link https://docs.google.com/forms/d/e/1FAIpQLSen051jz8IbrAEvRBFp6n4j3fj1f6koGIC-ZqC1k4Tgo00ILQ/viewform?usp=sf_link

Data Collection Methods

The data of the research were gathered with the help of personal information form, phubbing scale, and empathic tendency scale.

Personal Information Form

It was developed to collect identifying information about the students who were willing to participate in this study. It includes information such as age, gender, which department they are studying in, the number of friends, and the number of books they read.

Phubbing Scale

The scale developed by Chotpitayasunondh and Douglas (2018) assesses the negative impacts of phone use on social relationships among college students [12]. The Turkish reliability and validity of the scale were carried out by Ergün et al. (2020) [13]. The phubbing scale is composed of four subscales and 15 items. The sub-dimensions of the scale are; nomophobia as the first sub-dimension, interpersonal conflict as the second sub-dimension, self-isolation as the third sub-dimension, and problem acceptance as the fourth sub-dimension. The scale is a seven-point Likert-type scale. Cronbach's alpha value of the scale was determined as 0.95. In this study, the total Cronbach's alpha coefficient of the scale was calculated as 0.912.

Empathic Tendency Scale

It is a measurement tool developed by Üstün Dökmen (1988) that takes into account the personality characteristics of people with empathic sensitivity [14]. The scale has 20 items and a 5-point Likert type. There are negative items (8 items) on the scale. The Cronbach alpha value of the Empathic Tendency Scale was determined as 0.82. In this study, the scale's total Cronbach alpha coefficient was obtained as 0.86.

Data Analysis

SPSS v22.0 package software was employed for statistical analyses. Following the descriptive statistical methods (percentage, number, standard deviation, mean), the Kolmogorov-Smirnov test was used to analyze if the data were distributed normally. For the comparison of two normally distributed groups, Student's t-test was used, and ANOVA was employed for comparisons of three or more groups with normal distribution. Regression and correlation analyses were utilized to analyze the relational data [15].

Ethics Committee Approval

Firat University Non-Interventional Research Ethics Committee granted clearance for the study's execution (2021/12-36). The articles in the Declaration of Helsinki were taken into consideration at all stages of the study.

Results

The descriptive characteristics of the volunteers enrolled in the study are displayed in Table 1. The average age of the students was 21.68±1.87, 71.2% were male, 38.9% were in the second grade, 50.9% read a book once a week, 57.8% had 5-14 friends and 63.2% met with their friends 1-3 days a week.

According to Table 1, the mean phubbing score of college students who did not read books (62.98±17.76) was significantly higher than the mean phubbing scores of college students who read one book per week (34.92±5.25) and those who read more than one book per week (21.21±2.61). As the number of books read per week increased, a statistically significant difference was detected in the mean phubbing scores of college students. The Post Hoc (LSD) test performed to detect the difference between the student groups showed that the mean phubbing score of the college students who did not read books was higher than the mean phubbing score of the college students who read more than one book per week, which was a significant difference (Table

1). The mean empathic tendency score of college students who do not read books (58.41±8.36) is lower than the mean empathic tendency scores of college students who read one book per week (63.86±5.52) and college students who read more than one book per week (67.81±6.52). There is a significant difference between the mean empathic tendency scores of college students according to the number of book readings per week. Post Hoc (LSD) test performed to detect the difference among the groups showed that the average empathic tendency score of the college students who did not read books was lower than the average empathic tendency score of the college students who read more than one book per week and that this difference was statistically significant (Table 1).

College students with fewer than 5 friends have the highest mean phubbing score of 85.00 ± 4.25, as shown in Table 1. As the number of friends increased, a significant difference emerged between the mean phubbing scores of college students. Post Hoc (LSD) test conducted to find out the difference between the groups revealed that the mean phubbing score of the college students with the least number of friends was higher than the mean phubbing score of the college students with the highest number of friends and that this difference was statistically significant (Table 1). College students with less than 5 friends had the lowest mean empathic tendency score of 45.80±5.80. There is a difference that is statistically significant between the mean empathic tendency score of college students as the number of friends increases. The Post Hoc (LSD) test conducted to analyze the difference between the groups showed that the mean empathic tendency score of the college students with the least number of friends was lower than the mean empathic tendency score of the college students with the highest number of friends, and the difference was significant (Table 1).

Table 1 shows that the mean phubbing score of college students who do not meet with friends is the highest (78.87±14.68). A statistically significant difference was also detected between the mean phubbing scores of college students as the frequency of meeting with friends rose. After the Post Hoc (LSD) test conducted for the intergroup difference analysis; it was seen that the mean phubbing score of the college students who did not meet with their friends was bigger than the mean score of the college students who met with their friends every day and created a significant difference (Table 1). The mean empathic tendency score of the college students who did not meet with their friends was 52.44±7.89 and had the lowest mean empathic tendency score. A significant difference emerged between the mean empathic tendency scores of college students as the frequency of meeting with friends increased. Post Hoc (LSD) test conducted to ascertain the difference between the groups revealed that the average empathic tendency score of the college students who did not meet with their friends was lower compared to the mean score of the college students who met with their friends every day, which was a significant difference (Table 1).

When looking at the overall mean scores of the college students, the average total score of the General Phubbing Scale was 42.77±19.09 and the average total score of the Empathic Tendency Scale was 62.52±7.56 (Table 2).

When the correlation between the average total scores of the empathic tendency scale and the General Phubbing Scale of the students was assessed (Table 3); it was detected that there was a strong negative significant relationship between the average total scores of the ETS and GSP of the students (r=-0.581, p=0.00).

Information about the model created by considering the relationship between general phubbing and the empathic tendency is given below. It was found that the regression model that was obtained to understand the relationship between students' general phubbing and empathic tendency was significant (F=215.285, p=0.00). In the model, it was ascertained that the general phubbing scale explained 33.7% (R2=0.337) of the empathic tendency. According to the model, it was detected that the general phubbing scale increased the empathic tendency (Beta=-0.581) negatively by 0.581 times (Table 4).

Table 1. Empathic tendency scale (ETS) and phubbing score averages according to the descriptive characteristics of the participants.

			Phubbing Ort ± Ss	ETS Ort ± SS
	n	%		
Gender				
Woman	302	71.2	43.65±19.11	62.97±7.82
Male	122	28.8	40.59±18.97	61.41±6.79
Statistics				
t			1.496	1.066
P			0.135	**0.05**
Education status				
1st Class	45	10.6	39.68±13.56	61.77±6.54
2nd grade	165	38.9	43.93±18.39	61.95±7.52
3rd grade	54	12.7	43.22±18.07	62.11±7.07
4th grade	160	37.7	42.30±21.38	63.45±7.99
Statistics				
F			0.634	1.320
P			0.59	0.26
Number of Reading Books per Week	148	34.9	62.98±17.76	58.41±8.36
Doesn't read books	216	50.9	34.92±5.25	63.86±5.52
Reading One Book a Week	60	14.2	21.21±2.61	67.81±6.52
Reading More than One Book a Week				
Statistics				
F			406.509	48.873
P			**0.00**	**0.00**
Number of Friends				
Less than 5 Friends	5	1.2	85.00±4.25	45.80±5.80
5-14 Friends	244	57.5	52.68±16.20	60.71±7.09
15-50 Friends	153	36.1	28.50±4.10	65.47±6.55
50+ Friends	22	5.2	18.09±1.79	65.81±8.53
Statistics				
F			185.138	25.794
P			**0.00**	**0.00**
Frequency of Meeting with a Friend per Week				
Not meeting	63	14.9	78.87±14.68	52.44±7.89
1-3 Days	268	63.2	41.10±8.87	63.29±5.02
4-6 Days	60	14.2	25.33±2.31	67.16±7.27
Every day	33	7.8	19.21±2.19	67.06±7.82
Statistics				
F			479.126	76.145
P			**0.00**	**0.00**

Discussion

In this research, the association between phubbing and empathic tendency skills of college students, whether phubbing predicts empathic skills, and whether or not there are differences between groups according to gender, the number of book readings per week, the number of friends, and the frequency of meeting with friends per week were investigated.

The difference between the college students' mean phubbing and empathic tendency scores and the number of books read per week, the frequency of weekly meetings with friends, and the number of friends was statistically significant. As the number of book readings per week, the frequency of meeting with friends, and the number of friends decreased, the mean phubbing score of the students increased and the mean empathic tendency score decreased. According to the findings of this research, people who develop regular book reading habits, read more than one book a week, have friends and meet with them more frequently show less behavior of being interested in the phone and ignoring the social environment due to the phone and have better empathy skills. Phubbing is a distraction and undermines the benefits of social interactions [12,16]. By reducing the sense of togetherness, it can impair communication quality, relationship satisfaction, and empathy skills [12,16]. Being phubbed is perceived as more irritant than being ignored by reading a magazine, as shown by Mantere et al. (2021), and this is typically due to people's perception that smartphones are a worse reason to ignore others than reading a magazine [17]. In a dissertation study conducted by Ballı (2020) on college students, it was stated that college students with high phubbing levels read less than one book a week due to engaging with the phone [8]. When the findings obtained from the number of book readings per week, having friends, and the frequency of meeting with friends are taken together in our research, we can presume that the level of phubbing is high.

In our study, students' phubbing negatively predicts their tendency to be empathetic, which supports our hypothesis. People with high phubbing levels have low empathic tendencies (Table 4). Empathy is defined as understanding and recognizing other people's emotions. Jones and Paulhus (2011) discovered that low levels of empathy would discourage college students from considering that other people might have

Table 2. Examination of the total mean scores of the participants.

Scale and Sub-Factors	Min-Max	Avg.	ss
General Phubbing	15-105	42.77	19.09
Empathic Tendency Scale	40-84	62.52	7.56

Table 3. The relationship between participants' Empathic Tendency Scale and Phubbing Scale Total Scores.

	1	2
1. Empathic Tendency Scale	1.0	
2. General Phubbing	**0.00**	1.0

Table 4. The prediction of the Empathic Tendency of the Participants' Phubbing Situations.

	Variable	**B**	**Standard Error B**	**β**	**T**	***p***
Model	**Fixed**	72,374	,735		98,459	,000
	General Phubbing	-0,230	,016	-,581	-14,673	,000
	R = 0,581 **R²** = 0,337					

desires and wishes [18]. In addition, individuals with low empathy tend to be dependent on social media and the internet because they are less social [19,20]. Social media and internet addictions lead to increased frequency of smartphone use [21,22]. Accordingly, it can be asserted that these individuals may also have high phubbing behaviors.

Conclusion

It was concludable that a strong negative relationship exists between the level of phubbing and the empathic tendencies of college students. Particularly, it is apparent that college students with high phubbing levels have low empathy skills. It is critical to assess the empathy skills of college students before they start their careers. Providing empathy skills to young people during their college education is very important to reduce phubbing attitudes. In the age of technology, it should be deemed necessary to direct young people to various social, cultural and sports-related activities in order to reduce the time they spend on social media platforms. It is important to plan guiding training to ensure conscious and beneficial use of social media platforms. We advise future researchers to carry out interventional studies to improve their communication skills and to utilize technology wisely.

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Conflict of interest

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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ORIGINAL ARTICLE

Evaluation of ocular and genetic findings in patients with Neurofibromatosis Type 1

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Abstract

Neurofibromatosis type 1 (NF1) is an autosomal dominantly inherited disease affecting multiple organ systems and showing many different clinical symptoms. The severity of the disease varies from person to person and progresses gradually over the years. In this study, 17 NF1 patients who had a definite diagnosis were evaluated in terms of genetic, ophthalmological, and nervous system investigations. Approximately 5000 patients who visited medical genetics clinic between 2012 and 2022 are recorded in our archive. In 17 of these patients, a definitive genetic diagnosis was made. In the course of the study, the researchers collected some clinical parameters such as antenatal, intrapartum, and postpartum history and family history. In the family history, the researchers did a detailed pedigree with at least 3 generations of analysis, questioned parental kinship, looked for similar members in families, and identified inheritance patterns of the disorder. Peripheral venous blood samples were taken from the patients and sent to a commercial laboratory for gene panels or WES while the karyotyping was carried out in our laboratory. After obtaining the definitive genetic diagnosis of all patients, we compiled a table with the other parameters we questioned. This study presented the genotype and phenotype findings of NF1 patients. Ophthalmological symptoms in patients were also examined. These new-generation genetic disease diagnosis methods can be routinely used in clinical practice by medical geneticists. The diagnosis of a disease is one step ahead of its treatment. Because if the necessary diagnosis is not made, treatment of the disease is not possible. While this situation was more difficult in the past, nowadays, with the developing technology, diseases can be diagnosed more easily. In NF1 disease, more information can be obtained as a result of genetics, imaging, and examinations of other branches.

Keywords: Genetic analyses, neurofibromatosis type 1, ophthalmology

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Introduction

Neurofibromatosis type 1 (NF1) is an autosomal dominant disease that affects multiple organ systems and has many variable clinical presentations. NF1 is characterised by neurofibromas. These are nerve sheath tumors that form in close association with spinal, peripheral, or cranial nerves. Other features include pigment changes, low-grade glioma, skeletal dysplasia, and involvement of many other organ systems. Although the specific manifestations, rate of progression, and severity of complications vary widely, the disease is progressive over a lifetime. Currently, there is no definitive treatment. Clinical management is typically limited to surveillance and symptomatic treatment, usually surgical, for specific complications [1].

The gene that causes NF1 was identified in 1990, and its function and role in tumourigenesis and other features of NF1 are being studied intensively. As our understanding of the mechanisms underlying the pathogenesis of the clinical features of NF1 has improved, a number of targeted therapies have emerged. These are now being evaluated in preclinical models and phase II clinical trials. For people with NF1, the emergence of new treatments aimed at improving their quality of life (QOL) is a time of great hope [2]. The aim of this study is to evaluate these patients with a definitive genetic diagnosis and to publish the results in the literature.

Neurofibromatosis Type 1 and Genetics Diagnosis

NF1 is caused by changes in the NF1 gene, which is located on chromosome *17q11.2*. Many lines of evidence suggest that NF1 is a tumor suppressor gene. Inactivation of both NF1 alleles would reduce control of cell proliferation and lead to tumorigenesis. The function of the NF1 gene product, neurofibromin, is to stimulate RAS protein GTPase activity and act as a negative regulator of the cellular Ras/MAPK (mitogen-activated protein kinases) pathway [3]. So far, more than 1.000 pathogenic allelic variants have been identified in the NF1 gene. Most NF1 mutations are single-base substitutions, insertions, or deletions. Other mutations are single- or multi-exon deletions or duplications and microdeletions encompassing NF1 and its neighboring genes [4].

The development of next-generation sequencing (NGS) technologies, which allow rapid identification of mutations and high-risk aleads that cause the disease, has recently entered NF1 diagnostics. Clinical diagnosis and molecular relations should be better understood. Therefore, a comprehensive genetic characterization of this disorder in a clinical environment will help to better understand the process [5].

Neurofibromatosis Type 1 and Oftalmological Clinical Features

It is the most common phakomatosis with autosomal dominant genetic inheritance. Sharply circumscribed, dome-shaped pigmented Lisch nodules, which are melanocytic hamartomas in the iris stroma, are the most common ocular involvement in NF1 [6]. Iris nevi, which can be confused with Lisch nodules, are observed as flat or slightly elliptical, densely pigmented lesions with blurred borders [7]. Lisch nodules are more common in the lower half of the iris than in the upper half due to increased exposure to sunlight and increased pigmentation [8]. In a study examining the distribution of Lisch nodules according to age, it was found that Lisch nodules were found in 5% under 3 years of age, 42% in 3-4 years of age, 55% in 5-6 years of age and all individuals over 21 years of age [7]. Therefore, the absence of Lisch nodules in children, which are included in the diagnostic criteria for NF1, does not rule out the diagnosis of NF1.

Lisch nodules, which are frequently seen bilaterally and in large numbers, are observed in one eye in segmental neurofibromatosis Cases in the half of the face where cutaneous lesions are present [9]. Lisch nodules do not require treatment because they are benign and do not cause visual loss [10]. Optic pathway gliomas are the most important lesions that cause visual loss. They are included in the NF1 diagnostic criteria and are seen in 5% to 25% of patients [11,12]. Gliomas, which are typically low-grade pilocytic astrocytomas involving the optic nerve, usually have an asymptomatic course, but depending on the site of involvement, patients may experience

decreased visual acuity, color vision impairment, visual field defects, relative afferent pupillary defects, proptosis, strabismus, nystagmus, and puberty precocity [10,13]. Since the risk of optic glioma decreases in children older than 8 years of age, it is recommended that detailed eye screening be performed every year until the age of 8 years and every two years between the ages of 8-18 years [14,15].

In patients with NF1-associated optic gliomas, it is important to follow up every three months in the first year after diagnosis, with an interval in the following period [14]. Diagnostic brain or orbital magnetic resonance imaging (MRI) is recommended to be performed by the ophthalmologist when a suspicious lesion is detected and simultaneously or less frequently with ophthalmological controls during follow-up [14]. Chemotherapeutic drugs such as vincristine or cisplatin may be used in symptomatic optic pathway gliomas [16]. Radiotherapy is generally not preferred in very young children because of the risk of neurological complications, vascular pathologies such as Moyamoya disease, and the risk of secondary malignancy [17,18].

Surgical treatment is generally not recommended, although it has been reported that surgical intervention can sometimes be performed to remove severe proptosis or dense chiasmal gliomas[18]. Rapamycin, a specific mTOR inhibitor, is thought to reduce astrocyte growth in vitro and may be an alternative in the treatment of optic gliomas and plexiform neurofibromas [19,20].

Neurofibromas are benign skin tumors that may involve the eyelid, brow, and orbit and are seen in less than 10% of patients with NF1 [6,12]. Neurofibromas that are soft on palpation and have a worm bag sensation are seen as an *S*-shaped deformity of the eyelid leading to asymmetric ptosis [6,11]. Neurofibromas of the nodular type are more common, whereas neurofibromas of the plexiform type are more clinically significant and can lead to proptosis, strabismus, amblyopia, and bone deformity [6,10]. Sphenoid bone dysplasia, which is associated with orbital plexiform neurofibromas, can be observed in NF 1 and as a result, the temporal lobe protrudes into the orbit, resulting in pulsatile proptosis synchronized with the heartbeat [11].

Surgical interventions are challenging due to the tumor location and high bleeding risks of neurofibromas, and therefore agents such as kinase inhibitors, mTOR inhibitors, and fibroblast inhibitors are mainly recommended for treatment [12-21]. Glaucoma, which can develop in patients with NF1 by many pathogenic mechanisms, is not common but may develop at birth or in early childhood [22]. The most common cause is disruption of aqueous drainage after neurofibromatous infiltration and obstruction, while secondary angle closure, synechial angle closure, and neovascular glaucoma may develop with ciliary body infiltration [22,23].

Corneal nerve dysfunction and thickening of the corneal nerves leading to corneal epithelial changes are thought to be due to genetic changes in axons and Schwann cells [24,25]. Although choroidal nodules can be difficult to detect by fundus examination and fluroscein angiography, indocyanine green angiography shows delayed perfusion in the choriocapillaries surrounding the nodule [26].

In NF1 patients with less retinal involvement, multiple retinal capillary haemangiomas, astrocytic hamartomas, and combined retinal-retinal pigment epithelium hamartomas may be seen [27]. In addition, epiretinal membrane, sectoral retinitis pigmentosa, and myelinated nerve fibers may be seen [28].

Material and Methods

This study was conducted with the approval of Afyonkarahisar Health Sciences University Ethics Committee (2022/12). 17 patients diagnosed with NF1, who were definitively diagnosed by our medical genetics clinic, were included in the study. We collected some clinical parameters, including the patient's prenatal, natal, and postnatal history, as well as family history, during our research. The family history included a detailed genealogy of at least three generations, asking about parental relationships, looking for similar members in the family, and identifying patterns of inheritance of the condition. While karyotyping was done in our

lab, the researchers collected peripheral venous blood samples from patients and sent them to a commercial lab for gene panels or WES. After obtaining the definitive genetic diagnosis of all patients, the researchers compiled a table with the other parameters the researchers questioned.

In NF1 disease, the characteristic findings of café au lait spots, Lisch nodules, neurofibromas, optic gliomas, osseous lesions, and family history are re-evaluated in patients. Hospital records were therefore used to obtain patients' presenting symptoms, family history, and MRI findings. Dysmorphic facial features were also identified from the patients' photographs. In this process, "The Elements of Morphology: Human Malformation Terminology" was used [28].

Results

Approximately 5000 patients who visited our medical genetics clinic between 2012 and 2022 are recorded in our archive. Of these, 17 had a definitive genetic diagnosis. Patients' mutation forms and family trees in the NF1 gene are shown in Table 1. In addition, clinical, dysmorphic, and radiological imaging findings of the disease are also given in Table 2.

In this study, 5 out of 17 patients were women. According to the genealogical analysis of the patients, de novo mutation was detected in only two patients (Case 12 and Case 15). The families of the other 13 patients had affected family members. All of the mutations were referred to as heterozygous mutations. Cases 5 and 6 were uncles-nephews, Cases 10 and 11 were siblings, and Cases 12 and 13 were mother-son. Two patients had the intronic mutation. The non-coding mutation was present in Case 3. In Case 7, there was a splicing mutation. In the other 13 patients, the mutation was located in the exon region. Of the 17 patients in the study, 13 had pathogenic mutations according to the American College of Medical Genetics (ACMG) mutation classification. One patient had the "uncertain significance" variant. The age range of patients with a definitive diagnosis was between 2 and 48 years.

In the study, 17 NF1 patients presented primarily because of café au lait spots on their bodies. Apart from these spots, other presentation symptoms were as follows; neurofibromas, lisch nodules, disorders of neurodevelopments, unilateral hearing loss, ataxic gait, seizures, and short stature. In addition, the most common dysmorphic facial feature of these patients was both a long face and a deep eye. The second most common was both the long chin and the Cupid's Bow feature. The third was thick eyebrows.

In 4 out of 17 patients, hamartoma or hamartoma-like images were noted on brain MRI. In addition, a normal brain MRI was performed on 4 patients. When the researchers evaluated Case 2, there was a pontocerebellar arachnoid cyst. Therefore, the patient had unilateral hearing loss. This was the only Case in the study with a false sensory mutation. In addition, cerebellar hamartoma was present in Case 2, Case 7, and Case 13. However, there was no evidence of cerebellar hamartoma in patients. Optic nerve thickening prevailed only in Case 13.

In addition, when the researchers evaluated Case 15, the NF1 mutation caused mental retardation and autism in the patient. Case 16 presented to us with café au lait stains on her body. Head circumference and brain MRI were normal. In addition, the patient's sister and mother had similar findings, and optic glioma was additionally detected in the sister.

When the researchers evaluated Case 17, there were widespread cafe au lait stains on her body. When the researchers examined the brain MRI, the researchers was that there were calcification and atrophic lesions in the brain. The patient was also diagnosed with epilepsy. Her mother had an NF1 mutation. Similar spots were also observed in her sister.

Table 1. Genetic analysis results and heredity.

CASE ID	AGE AT TESTING (YEARS)	MUTATION(S)			ZYGOSITY	MODE OF TRANSMISSION
		ALTERATION	EXONI / INTRON NUMBER	TYPE		
1	37	NJF1 c.4537 CST p.Arg1513X	Exon 35	Nonsense	Heterozygous	Autosomal dominant
2	23	NJF1 c.2531 T>6 p.L844R	Exon 21	Misssense	Heterozygous	Autosomal dominant
3	27	NJF1 c.2990+5 GSA	Intron 22	Non-coding	Heterozygous	Autosomal dominant
4	40	NJF1 c.6955 CST p.Q2319*	Exon 47	Nonsense	Heterozygous	Autosomal dominant
5	10	NJF1 c.910 CST p.R304*	Exon 9	Nonsense	Heterozygous	Autosomal dominant
6	32	NJF1 c.910 CST p.R304*	Exon 9	Nonsense	Heterozygous	Autosomal dominant
7	29	NF1 c.1392+16>T	Intron 12	Splicing	Heterozygous	Autosomal dominant
8	48	NJF1 c.4084C>T p.R1362*	Exon 30	Nonsense	Heterozygous	Autosomal dominant
9	8	N El c.6772C>T p. R2258*	Exon 45	Nonsense	Heterozygous	Autosomal dominant
10	22	NF1 c.109_110delGA p.G1u37Alafs*29	Exon 2	Frameshift	Heterozygous	Autosomal dominant
11	16	NF1 c.109_110delGA p.G1u37Alafs*29	Exon 2	Frameshift	Heterozygous	Autosomal dominant
12	36	NF1 c.1541_1542delAG p.O.514Rfs*43	Exon 14	Frameshift	Heterozygous	De novo
13	6	NJF1 c.1541_1542de1AG p.0514Rfs*43	Exon 14	Frameshift	Heterozygous	Autosomal dominant
14	2	NJF1 c.3011_3011de1A p.N10041fs*8	Exon 23	Frameshift	Heterozygous	Autosomal dominant
15	7	NF1 c.499_502deITGIT p.C1671s*10			Heterozygous	
16	19	NJF1 c.5675de1A p.K1892fs*12	Exon 38		Heterozygous	Autosomal dominant
17	10				Heterozygous	Autosomal dominant

Table 2. Patient clinical information and findings.

CASE ID	PRESENTING SYMPTOMS	DYSMORPHIC FEATURES	MRI FINDINGS
1	Multiple cafe au lait spots, neurofibromas, lisch nodules	Prominent supraorbital ridges, cheekbones prominence, deeply set eyes, prominent antihelix stems, protruding ears, macrotia, low insertion columella	Nonspecific hyperintense signal in T2-FLAIR A sequences which is oval configuration measured as 7x5 mm in the right frontal white matter at the centrum semiovale level, L2-S1 vertebra perineural cyst
2	Multiple cafe au lait spots, neurofibromas, unilateral hearing loss	Long face, broad forehead, deeply set eyes, broad eyebrows, thick eyebrows, long palpebral fissures, prominent antitragus, long ears, narow nasal bridge, fullness paranasal tissue, deep philtrum, exaggerated Cupid's Bow	Pontocerebellar aracnoid cyst, mega cisterna magna, right cerebellar hamartoma
3	Multiple cafe au lait spots	Long face, cheekbones prominence, broad chin, deeply set eyes, narrow nasal ridge, deep philtrum, exaggerated Cupid's Bow, thin lower lip wermillon	N/A
4	Multiple cafe au lait spots, neurofibromas	Long face, malar flattening, prominent nasolabial fold, broad chin, deeply set eyes, thick eyebrows, telecanthus, enlarged nares, wide nasal base, wide nasal bridge, deep philtrum, exaggerated Cupid's Bow, thin lower lip wermillon	N/A
5	Multiple cafe au lait spots, seizure, neurodevelopmental delay, lisch nodules	Malar flattening, thick eyebrows, telecanthus, thick ala nasis, bulbose nose, long philtrum, thick lower lip vermillon, thick upper lip vermillon	Arachnoid cysts, cavum septum pellucidum et vergae
6	Multiple cafe au lait spots, neurofibromas	Long face, narrow face, prominence cheekbone, tall chin, thick eyebrows, low hanging columella, wide nasal base, thick upper lip vemillon, thick lower lip	N/A
7	Multiple cafe au lait spots, neurofibromas	Brachycephaly, frontal balding, long face, prominence cheekbones, long chin, deeply set eyes, hypotelorism, sparse eyebrow, prominent antitragus, thick ala nasi, low insertion columella, narrow nasal bridge, smooth philtrum	Cerebellar hamartoma, neurofibromas
8	Multiple cafe au lait spots, neurofibromas, sarcoma excision from arm	Long face, cheekbones prominence, malar flattening, broad chin, tall chin, deeply set eyes, downslanted palpebral fissures, high insertion columella, malaligned philtral ridges	Triceps muscle sarcoma, bladder mesencimal sarcoma

9	Multiple cafe au lait spots, ataxic gait	Malar prominence, deeply set eyes, sparse eyebrows, infraorbital creases, upslanted palpebral fissures, ptosis, thick ala nasi, wide nasal bridge, wide nasal ridge, deep philtrum, exaggerated Cupid's Bow	Hamartomas in superficial and deep white matter, periventricular white matter, left cerebellar hemisphere, corpus callosum, bilateral globus pallidus
10	Multiple cafe au lait spots, neurofibromas	Full cheeks, midface prominence, tall chin, downslanted palpebral fissures, wide nasal base, thick lower vermillon	N/A
11	Multiple cafe au lait spots, neurofibromas	Triangular face, full cheeks, midface prominence, pointed chin, downslanted palpebral fissures, wide nasal base, thick lower vermillon	N/A
12	Multiple cafe au lait spots	Broad chin, tall chin, smooth philtrum, thin lower lip vermilion	N/A
13	Multiple cafe au lait spots, short stature	Midface prominence, pointed chin, tall chin, wide spaced eyes, upslanted palpebral fissures, telecanthus, overfolded helix, narrow nasal ridge, exaggerated Cupid's Bow	Hamartomas in brain stem, cerebellar hemisphere and cerebral hemispheres, thickening of optic nerve
14	Multiple cafe au lait spots, developmental delay	Broad forehead, short chin, prominet antihelix stem, serpenginous antihelix stem, wide nasal base, wide mouth	N/A
15	Multiple cafe au lait spots, regressive autism	Macrocephaly, loss of speech	NF1 findings on the brain MRI
16	Multiple cafe au lait spots	NF1 mutations in her sister and mother	N/A
17	Multiple cafe au lait spots, epilepsy	NF1 mutations in her mother	Calcifications and atrophic lesions

Discussion

Genotype and phenotype results of NF1 patients were presented in this study. Ophthalmological symptoms in patients were also examined. This new generation of genetic disease diagnosis methods can be routinely used in clinical practice for medical geneticists.

De novo mutations, which are changes in a gene that occurs for the first time in a family member, are common in autosomal dominant disorders. NF1 is one of these diseases. Nearly half of all NF1 Cases occur as a de novo disease. In our study, de novo mutation was detected in one patient. In our other patients, autosomal dominant mutations were detected [28].

Mutation type is one of the elements used to classify mutations. For this reason, the type of mutation is an important step in the genotyping process. The rate of mutation types in the NF1 gene is reported to be between 21% and 38% for a nonsense mutation. According to ClinVar genetic database, 407 of 6254 variants are reported as nonsense [29,30]. The rate of variation in the intronic region of the NF1 gene, where the gene is not translated, is reported to be 43% to 20%. ClinVar genetic database showed an intronic mutation rate of about 12%. Considering that the variants causing NF1 disease may occur not only in exon regions but also in intronic regions, genetic analysis should be preferred. For this reason, it is recommended that methods of genetic analysis such as next-generation sequencing, which can detect changes in intronic regions, are chosen [31].

According to the ACMG criteria, variants identified by genetic analysis are classified into 5 classes. Class 2 is reported as "likely to be pathogenic" and class 1 is reported as "pathogenic". The disease is thought to be caused by variants in these two criteria groups. So far, 96 potentially pathogenic and 1753 pathogenic variants of the NF1 gene have been reported in the ClinVar database. In addition, over 2800 different pathogenic variants of the NF1 gene were identified in the University of Alabama cohort [32].

In the literature, the pathogenic mutation detection rate is between 89% and 96%. In this study, only 2 of the 17 NF1 analyses were "likely pathogenic", which is a new mutation, while the other 15 analyses resulted in "pathogenic" variants [33].

Doctors are becoming increasingly successful in diagnosing genetic diseases as technology advances. These include DeepGestalt (Face2Gene) technology that uses artificial intelligence. This has been reported to be successful in diagnosing between 86-91% [34]. Next-generation phenotyping (NGP) programs such as Face2Gene are recommended to be used in routine examinations, especially by medical genetics doctors and pediatricians. In addition, studies have shown that Face2Gene has a high success rate in patients with significant dysmorphic facial features [35].

The brain is responsible for controlling our entire body. That is why it is protected by a very dense and protected layer of bone called a cranium. Until the invention of MRI, it was not easy to detect morphological changes in the brain. Today, researchers can almost take a photograph of the brain with MRI [36]. Research has shown that NF1 disease also leads to some changes in the brain. One trial found that 6,5% of people with NF1 had a normal MRI. This was 35% in our study. This result illustrates the wide range in which NF1 can occur. In genetics, this is defined as variable expression. NF1 is one of the genetic diseases with high variable expression [37].

In a study conducted in Spain in 2019, arachnoid cysts were detected in brain MRI in 3 of 85 NF1 patients. In our study, arachnoid cysts were detected in 1, hamartomas in 3, and calcified areas in 1 of 17 patients [38]. In another study conducted in Türkiye, hamartomatous lesions in the central nervous system were found in 16 of 19 patients with NF1. As a result, NF1 cannot be diagnosed with brain MRI alone. Because no specific picture exists for the condition. However, as the disease causes lesions in the brain, an MRI of the brain is recommended for patients with NF1 [39].

When the researchers looked at the family tree of Case 16, it was determined that there were similar findings in her mother and sister. The sister of

the Case also identified optical glioma. Similarly, in the study that was conducted by Dr. Parkhurst et al., among the 708 patients diagnosed with NF1, 30 patients had optic glioma. The general findings of half of the patients are visual loss, proptosis and early adolescence. It also showed two-sided placement for 19 patients, right-hand side for seven patients, and left-hand placement for four patients. In these studies, many of the NF1 patients did not go to the doctor for eye control, and in NF1 children, they said that they developed asymptomatic optic glioma at a time as early as one year old. They emphasized that with annual eye checks and early puberty screening, optical gliomas can be diagnosed early [40].

In our study, two out of 17 patients had Lisch nodules: Case 1 and Case 5. When the researchers evaluated similar studies, Dr. Abaloun et al. presented NF1 patients at the age of 45. In the ophthalmological examination of the patients, he identified Lisch nodules and P+ visual acuity in both eyes of a patient in biomicroscopic examination [41]. Only one patient had autism other than the general NF1 clinical features. Dr. Garg et al. included 207 patients in their studies. According to the responses of 109; 32 patients had high levels of autism, 29 patients had no secondary autism, and 48 patients had no autism. Then, 23 people from the high-level autism group, 16 people from the middle-level autism group, and 16 people from the non-autism group were randomly selected and reviewed. Their analysis stressed that more research should be done for NF1, but still high levels of autism can be seen [42].

Conclusion

The diagnosis of diseases is one step ahead of the treatment of them. Because if the necessary diagnosis is not made, treatment of the disease is not possible. While this situation was more difficult in the past, nowadays, with the developing technology, diseases can be diagnosed more easily. In NF1 disease, more information can be obtained as a result of genetics, imaging, and examinations of other branches. For this reason, clinical and genetic departments should carry out joint studies in terms of early diagnosis, treatment and follow-up of hereditary diseases.

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Conflict of interest

There is no conflict of interest to disclosure regarding this study.

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REVIEW

Emotional problems experienced by mobbing victims and a research model proposal in terms of cognitive behavioral model

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Abstract

This study aims to review the literature about the emotional problems experienced by mobbing victims in the workplace and present a research model. Defined as a severe source of social stress in the workplace, mobbing systematically involves protracted and escalating conflicts with frequent abusive acts against the target person. Mobbing significantly impacts a victim's emotional health, which can cause various psychiatric, psychosomatic, and psychosocial issues. Studies have shown that mobbing victims often suffer from anxiety, depression, irritability, psychosomatic symptoms, and sleep disturbances. In addition, they may experience low self-esteem, a lack of social skills, and a sense of submission. The consequences of mobbing go beyond the individual and affect their families and relatives. In this research, a literature review is conducted about the causes, manifestations, and consequences of mobbing. A research model is designed to emphasize the importance of cognitive behavioral techniques in combating emotional problems caused by exposure to mobbing behaviors in the workplace.

Keywords: Mobbing, employee problems, emotional problems, emotional disorders

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Introduction

Mobbing is psychological violence that creates a negative atmosphere within the organization, affects the psychological health of employees, and includes unpleasant behaviors. It is systematically applied by someone or some people to remove a person or persons from the workplace. The mobbing phenomenon, which can potentially cause irreparable consequences for the individual, the organization, and society, has become increasingly important daily. The increase in its importance in practice has led researchers to investigate the mobbing phenomenon more. In the literature on mobbing, quantitative and qualitative studies have been conducted and continue to be conducted. Although many researchers have addressed the concept of mobbing, it remains unknown in some aspects. We encounter new information about the antecedents and consequences of mobbing every day. In this respect, continuing research on the subject is very important [1].

In order to draw attention to the concept of mobbing, European Union countries frequently express the issue's importance in the media. In France, psychological harassment in the workplace is recognized as a crime and is punishable by one year's imprisonment [1,2]. From the perspective of clinical psychology, the self-perceptions of individuals who are victims of psychological violence, or, in other words, their sense of self, can be damaged [3].

The wound to their self-perception will bring about negative emotions [4]. Considering the Cognitive Behavioral Model, the main action will be to bring the thoughts of the individuals whose thoughts about themselves are harmful due to mobbing to a more realistic level and replace distorted thoughts with realistic ones. In this study, the concept of mobbing will be examined in detail, examples from the literature will be given of the emotional problems experienced by mobbing victims, and then a research model will be proposed. As a result of the literature review on the consequences of mobbing, it can be stated that no study deals with mobbing in terms of Cognitive Behavioral Techniques for combating it. In this study, the research results on the emotional problems experienced by the employees exposed to mobbing will be given, and a research model proposal will be presented in terms of coping with mobbing in the Cognitive Behavioral Model.

Theoretical Framework

Mobbing

Ethologist Konrad Lorenz first used the word mobbing to describe aggressive animal gang behavior [5]. In the 1970s, physician Peter Heinemann used the term in his study analyzing the hostile behavior of a group of children toward a single child. In the 1990s, Leymann borrowed the term to describe similar workplace behaviors and started researching the phenomenon [3]. In organizations, mobbing can be defined as a form of psychological harassment with severe consequences for the target person. Leymann defined mobbing as a type of conflict in which victims are subjected to stigmatization and their civil rights are violated [3]. Leymann says this should be done at least once a week and for at least six months. This traumatizing experience can lead to an individual's complete withdrawal from the labor market, as victims may eventually become unable to cope with work.

The phenomenon of mobbing is seen in several manifestations within the workplace, including but not limited to psychological fear, emotional lynching, harassment, bullying, and intimidation [6]. According to Zacharová and Bartosovic, individuals who experience mobbing often exhibit indications of submissiveness, anxiety, neuroticism, deficient social aptitude, and diminished self-esteem [7]. According to Minibas-Poussard and Idig-Camuroglu individuals may also have sleep disturbances, difficulties with focus, and preoccupations [8]. The adverse effects on the mental and physical well-being experienced by individuals subjected to mobbing may substantially impact their overall health and general quality of life [9].

The notion of mobbing was first introduced into the literature by Heinz Leymann, as noted by Zapf [10]. Leymann is the pioneering researcher who developed the first inventory of the mobbing phenomenon. The Leymann Inventory of Psychological Terrorization, created by Leymann in 1989, evaluates whether certain

behaviors and attitudes are mobbing and the severity of mobbing. Leymann made notable contributions to the scholarly discourse on mobbing and presented a detailed elucidation of the mobbing phenomena [3].

Mobbing refers to unethical conduct whereby individuals are subjected to systematic exposure inside the workplace. The employee has a sense of powerlessness and subsequently adopts a state of helplessness due to mobbing activities. The persistence of these organized acts of harassment may manifest specific psychosomatic ailments inside the affected person [3]. The causes of mobbing can be attributed to various factors, including organizational, workgroup-related, and personal factors. Organizational factors such as power dynamics and ineffective management can contribute to mobbing. Work group-related factors, such as conflicts and competition among colleagues, can also play a role. In addition, personal factors, including personality traits and individual vulnerabilities, can make individuals more susceptible to mobbing [10].

The consequences of mobbing on the psychophysical health of victims have been extensively studied. Employees who are subjected to mobbing often experience decreased emotional stability, increased belief in fairness, low self-esteem, and cynicism [11]. They may also experience anxiety disorders, depression, and concentration problems [8]. The negative consequences of mobbing not only affect the victims but also have negative consequences for their families and relatives [8].

One of the essential points to emphasize about mobbing is which types of behaviors can be considered mobbing. The types of behaviors that can be considered mobbing are listed below [1]: Physical attack, bullying, exclusion, threat, torment, rude behavior, swearing, shouting, scolding, biting, kicking, ıntimidation, beating, murder, clawing, religious and racial harassment, punching, and unacceptable ındirect ınsinuations name-calling, rape and deliberate silence ınjury; making work done by shouting and yelling; not authorized by not trusting; behaving in a degrading manner.

When examined in terms of CBT, the individuals are cognitively caused to have negative thoughts about themselves and the situation, and a negative emotional state follows. This emotional state also affects behavior. The next section will discuss the antecedents and consequences of mobbing behaviors. Then, a research model will be proposed by making suggestions to solve the emotional problems of individuals exposed to mobbing in CBT.

While mobbing remains popular as a concept in occupational psychology, there is some confusion regarding its definitions. It is not possible to define every behavior in the workplace as mobbing. Leymann pointed out that in order for a behavior to be considered mobbing, it must meet all of the following criteria [3]:

- It must be applied systematically (for at least six months and at least once a week).
- It must be purposeful (usually to cause the person to leave the job).
- It must cause psychological damage.

Namie says all bullies (mobbing perpetrators) exhibit narcissistic characteristics [12]. Einarsen et al. found that bullies define themselves as aggressive and have high social anxiety [13]. The self-confidence of the victim of mobbing is an essential factor in the mobbing process. The more aggressively aware the individual is of the victim's lack of self-confidence, the more disturbing it will be. In the mobbing process, no personality structure is a candidate for mobbing, but the profiles as lonely, strange, successful, and newcomer person have the potential to become mobbing victims [1,14]. Mobbing increases stress and psychological and physical complaints in individuals. In this context, individuals who face this situation may experience symptoms such as headache, tachycardia, stomach problems, high blood pressure, sleep problems, physical complaints, impaired concentration, worry, difficulty in starting an activity (inertia), social isolation, *etc.* [15].

Emotional Problems and Mood Disorders Experienced by Mobbing Victims

Emotional Problems and Mood Disorders

Mood refers to the average state of our emotions

over a certain period. A person may feel good from time to time, or he or she may feel bad from time to time and be depressed. These fluctuations that occur from time to time in a person's life are normal, but what makes the situation pathological is that these fluctuations can cause severe damage to the person's vital functions. There are two main types of mood disorders [16]: Depressive disorders and bipolar disorders.

Within the title of depressive disorders in DSM-V, six dimensions can be listed as disruptive mood disorders, dysthymia, premenstrual dysphoric disorder, depressive disorder caused by substance medication use, depressive disorder due to another medical condition, and depressive disorders not otherwise recognized or described [16,17]: The disorders included in the title depressive disorders in DSM-V [16] are as follows [17]: Bipolar I disorder, bipolar ıı disorder, cyclothymia disorder, disorders caused by the substance or medicine, bipolar disorders due to another medical cause, unspecified medical disorders not due to any other cause. The main characteristic feature of depressive disorders is that they negatively affect the functionality of the person's life and make the person feel extremely sad and restless. Somatic and cognitive changes accompany this mood. Types of depressive disorders differ due to their cause, duration, and time of occurrence [18].

Emotional Problems Experienced by Mobbing Victims

As a severe form of workplace harassment, mobbing has significant effects on the emotional well-being of its victims. This literature review aims to explore the emotional problems experienced by mobbing victims by utilizing relevant research studies and literature. Studies have shown that mobbing victims often suffer from various emotional problems, such as anxiety, depression, irritability, and psychosomatic symptoms [19,20]. Mobbing victims may show signs of submission, anxiety, neuroticism, a lack of social skills, and low self-esteem [19]. They may also experience sleep disorders, concentration problems, and obsessions [8]. Emotional and physical health problems faced by mobbing victims can significantly affect their general health status and quality of life [9].

First, interpersonal relationships and emotional well-being are linked according to well-established psychological theories [21]. Difficulties in close relationships can contribute to emotional adjustment problems, and emotional problems can negatively affect close relationships. This suggests that individuals who experience mobbing behaviors, which include harmful behaviors from others in the workplace, may also experience emotional problems. Second, emotional intelligence plays a role in understanding and managing emotions [22]. Emotional intelligence refers to the ability to recognize, understand, and regulate one's own emotions and the emotions of others. Research has shown that individuals with higher emotional intelligence can better cope with stress and have better mental health outcomes [23]. Therefore, individuals with high emotional intelligence may be more resistant to mobbing behaviors, and as a result, they may be less likely to experience emotional problems.

In addition, childhood trauma experiences were found to affect the perception of intimidation [24] significantly. Childhood traumas such as abuse and neglect may affect individuals' mental health and well-being. The victim acceleration theory suggests that individuals who have experienced childhood trauma may be more likely to perceive and interpret workplace behaviors as mobbing. This perception of mobbing may contribute to emotional problems. Moreover, mobbing behaviors have been associated with emotional and physical health problems [20]. Mobbing victims may experience high stress, sleep disorders, anxiety, and other emotional problems. This suggests that mobbing behaviors may directly contribute to emotional problems.

The consequences of mobbing go beyond the individual and affect their families and relatives. Mobbing victims may experience a decrease in emotional stability, self-esteem, and belief in justice, as well as an increase in cynicism [9]. Studies have also reported that mobbing victims show symptoms of anxiety disorders, depression, and concentration problems [8].

Sleep problems, the use of sleeping pills or tranquilizers, and even suicidal ideation have been detected in mobbing victims [8]. The causes of mobbing can be attributed to various factors, including organizational, workgroup-related, and personal factors. Organizational factors such as power dynamics and ineffective management can contribute to the emergence of intimidation. Work group-related factors such as conflicts and competition among colleagues may also play a role [19]. In addition, personal factors, including personality traits and individual vulnerabilities, may make individuals more susceptible to mobbing.

It is important to note that mobbing does not only affect certain professions but can occur in various sectors, including healthcare [19,20,25]. For instance, nurses are particularly vulnerable to mobbing and may experience higher anxiety levels, depression, and physical symptoms [20,25]. Workplace intimidation may also affect patient safety and health [25]. Mobbing has been associated with many emotional problems among victims as a form of workplace bullying. Mobbing can create an environment of fear and anxiety, leading to prolonged periods of stress [13]. Mobbing victims often experience feelings of anxiety and depression [19]. These emotional problems may continue even after the end of mobbing [26]. Furthermore, research by Leymann [3] revealed that sustained mobbing often leads to posttraumatic stress disorder (PTSD), underscoring the extreme emotional distress caused by such bullying. A study by Vartia found that even witnessing mobbing can significantly negatively affect employees' emotional health, intensifying feelings of helplessness, guilt, and fear [27]. Being exposed to mobbing leads to emotional, physical, and psychological consequences. Studies show a relationship between mobbing experiences and stress-related cardiovascular diseases [28]. The impact of mobbing often transcends the victim's personal life and disrupts social and family relationships [29]. Over time, these emotional pressures can lead to disruptions in social functioning and withdrawal from family activities.

Furthermore, research by Zapf et al. highlights the critical need for preventive strategies and interventions in work environments, pointing out that in severe cases, mobbing can lead to suicidal thoughts and attempts [10]. Emotional problems resulting from mobbing can lead to lower productivity and job satisfaction, increased sick leave, and higher turnover rates, implying significant costs for organizations beyond the personal consequences borne by the individuals subjected to mobbing [13].

From a cognitive perspective, mobbing victims often suffer from impaired concentration and decision-making abilities [30]. These cognitive effects can further affect victims' job performance and career development. In more severe cases, mobbing victims may even show symptoms of PTSD, where their traumatic experiences interrupt their daily lives [26]. Although the emotional problems experienced by victims of mobbing are severe, it is possible to say that interventions such as psychological counseling, workplace policies, and conflict resolution training can help alleviate the effects and facilitate recovery [31]

In physics, stress defines the pressure on an object and the reaction of the object against this pressure. From this point of view, stress expresses both an effect, an antecedent, and a consequence. Based on this logic, it would not be wrong to say that stress describes a process. Selye also participated in this discussion as a party and emphasized that stress is a reaction and interpreted it as our body's reaction against the distressing change called a stressor [32,33]. Selye handles the process he expressed about stress under the "General Adaptation Syndrome" title. In Selye's theory, the stressor is a distressing factor that increases the person's stress level [34]. In Selye's General Adaptation Syndrome, when an individual encounters a stressor, he or she goes through three stages [33]:

- Alarm Phase
- Resistance Phase
- Exhaustion Phase

The alarm phase refers to the situation in which the individual first encounters the stressor. It

would be appropriate to explain this with an example. Imagine that you are alone in a forest. No one is near you, and you are confronted with a tiger. What would be your first reaction? This first encounter defines the alarm phase. The role of the individual's nervous system in the alarm phase is undeniably essential. At this point, the nervous system and its role in stress management will be briefly mentioned. In the literature, it is accepted that there are two types of nervous systems. The peripheral nervous system carries the stimuli it receives directly to the center and sends the information from the center to the muscles, glands, and other related places. Actions that are under the control of the brain and that we perform voluntarily are organized by the somatic nervous system. The autonomic nervous system organizes the functioning of the internal organs by working against our will [33]: In the alarm phase, homeostasis is disrupted because the person encounters a stressor, and some psychosomatic and behavioral symptoms are observed in this phase. These symptoms are as follows [35,36]: eating much food, eating less food, headache, tremors [in hands and legs], inability to sleep or sleeping too much, lack of motivation, low back and back pain, stomach pain, disturbances in the intestines, nausea and vomiting, attention deficit.

In the alarm phase, the person is out of their comfort zone; in other words, homeostasis is disturbed. Therefore, the individuals will try to regain this homeostasis, that is, the state of balance. For this reason, they will try to fight or escape from the stressor. The step at which this fight-or-flight decision is made defines the resistance phase. There are two basic options for the individual in the resistance phase. Either the individuals will fight with the stressor and remove it from their lives, or they will escape. If we return to our example, the person faced with a tiger will either fight this tiger or try to escape if he thinks he cannot fight. Whether the person fights or runs away, this endeavor must eventually end so that they can return to their former state, that is, homeostasis. When the individuals can effectively fight or escape from the stressor, they can return to the desired level of homeostasis. However, they become exhausted if they cannot eliminate or escape the stressor. In cases where the stress factor continuously affects the individual, the individual enters a state of exhaustion, and stress becomes chronic. Johnstone [33] calls this situation chronic stress. At this point, the individuals lose confidence to cope with stress effectively and enter the exhaustion phase. When stress is mentioned, negative meanings usually come to mind. However, stress is also a function of motivation. Selye categorizes stress into two types: eustress (good stress) and distress (bad stress), and he noted that the amount of stress a person experiences can significantly improve their performance and harm it. It would not be wrong to say that motivation is zero at the point where the stress level is zero. This point shows that the person does not attach importance to whatever issue. However, when the stress level starts to rise above the optimum level, the individuals will start having difficulty managing their stress, and the intense anxiety in this situation will negatively affect their performance. For example, the point where the stress of a young person who will take the university exam is zero means that people have no expectations and do not attach importance to what they will achieve as a result of the exam. At this point, the person does not show symptoms of stress, but there is no positive performance.

When the stress level increases, some psychosomatic and psychological symptoms are observed. These symptoms can be analyzed in four sub-dimensions [37]:

- Physical Symptoms
- Emotional Symptoms;
- Social Symptoms
- Mental Symptoms

Although many life events that increase the stress experienced by the individual can be mentioned, it should be noted that the process is highly subjective. The life events that will act as stressors for each individual are different. However, research has generally revealed that some life events cause more stress than others, and in this framework, comparisons have been made between some stressors. From this

perspective, Holmes and Rahe developed the scale of stressful life events [38].

The effect of mobbing on our lives, where the main goal is to make the person leave the job, is better understood when the research is analyzed. The main issue is how the mobbing victims should manage their stress effectively and which strategies should reduce their emotional state. In the following section, some suggestions will be made regarding CBT by mentioning what should be done to reduce the emotional state experienced as a result of mobbing and to combat mobbing.

Coping with Destructive Emotions as a Result of Mobbing: Application of Cognitive Behavioral Techniques

As mentioned in the previous sections, mobbing has some very destructive consequences. If it is necessary to evaluate on behalf of organizations, it may be prudent to provide some information in order to take measures to prevent such processes from starting. Several organizational factors, such as organizational policies, the regulation of authorities, and transparent practices, define the institutions' duties. This study discusses how individuals exposed to mobbing can cope with the problem individually and which CBT can be helpful.

CBT is a widely used therapeutic approach focusing on the relationship between thoughts, feelings, and behavior. It is based on the perspective that our thoughts and beliefs influence our emotions and actions, and by identifying and challenging negative or unhelpful thoughts, individuals can change their behavior and improve their mental health. Therapists apply concrete and abstract CBT techniques in their practice. Concrete techniques involve using specific CBT strategies to change patients' beliefs, while abstract techniques involve discussing the cognitive theory of depression and exploring underlying schemas. In treating anxiety in primary care, CBT techniques such as behavioral techniques based on awareness and acceptance, relaxation training, exposure, cognitive restructuring, and behavioral activation are reported to be effective [39].

The techniques included in CBT techniques are as follows [40]: Socratic questioning, behavioral experiences, ıntellectual-emotional role play, basic faith worksheet, imaging, identification of advantages and disadvantages of beliefs, relaxation and mindfulness, exposure, role-playing, share technique. The primary purpose of the above techniques is to provide support by changing the individual's automatic thoughts and basic and intermediate beliefs with more realistic ones within the scope of psychotherapy and by creating behavioral change. It aims to transform dysfunctional thoughts into realistic thoughts and beliefs by supporting them with behavioral activations. CBT interventions have been reported to reduce sleep disturbances in adults with depression and anxiety effectively. Most CBT interventions target sleep specifically for this sample and effectively improve sleep within the group [41]. Emotional problems can have significant effects on individuals' mental health and well-being. Research shows that addressing individuals' emotional and behavioral problems is crucial for long-term results [42]. Emotional problems can manifest as behavioral disorders accompanied by anxiety and hostile attitudes. CBT techniques, such as social and emotional learning, can effectively treat behavioral problems and anxiety [43]. Bowins emphasizes the role of cognitive-behavioral techniques in addressing dysfunctional thoughts and behaviors associated with anxiety disorders and depression [44]. Wicksell et al. investigate the change process in acceptance and commitment therapy, a form of cognitive-behavioral therapy for patients with chronic pain [45]. Egan et al. focus specifically on the effectiveness of cognitive-behavioral therapy in treating depression and anxiety in Parkinson's disease [46].

Methodology

A literature review was conducted, and research on mobbing and the emotional problems experienced by employees exposed to mobbing were examined. In this context, a research model on the subject is designed.

Proposed Research Model

In the literature, the following research model is recommended to examine the emotional problems experienced by employees exposed to mobbing:

Independent Variable

Exposed Mobbing Behaviors: This variable refers to the emergence and intensity of mobbing behaviors that individuals face in the workplace. It includes various forms, such as psychological harassment, abuse, and social exclusion [19].

Moderator Variable

Cognitive Behavioural Techniques include determining automatic thoughts, intermediate and fundamental beliefs, and CBT techniques to replace these beliefs and thoughts with realistic ones.

Dependent Variable

Depression, Anxiety, and Stress: This variable includes the emotional difficulties, anxiety, depression, irritability, psychosomatic symptoms, and sleep disturbances experienced by individuals exposed to mobbing. It includes symptoms of both psychological and physical pain. Changes in individuals' social and working lives, which have an essential place in this, affect mental health. The most common effects are depressive and anxious moods and stress experiences [47]. Depression symptoms are characterized by feelings such as sadness, loneliness, and hopelessness, while anxiety symptoms are associated with feelings such as worry and fear [48]. Stress can be considered a tension that pushes physical and psychological limits [48]. Studies indicate that depression, anxiety, and stress can affect each other or be seen together [49-51].

The following research model is recommended in the literature to examine the emotional problems experienced by employees exposed to mobbing.

In terms of the above model, an individual exposed to mobbing behaviors may experience stress, anxiety, and depression. However, the use of cognitive behavioral techniques will reduce the level of stress, anxiety, and depression. Many studies show the relationship between exposed mobbing behaviors and depression, anxiety, and stress. International empirical studies have revealed that bullied workers exhibit a wide range of symptoms and psychopathological illnesses, including anxiety and depression [52] and post-traumatic stress [53-54]. Within the framework of the research model proposed above, the following hypotheses were established:

H1: Being exposed to mobbing behaviors significantly effects stress, anxiety, and depression.

H2: Cognitive behavioral techniques significantly affect the relationship between being exposed to mobbing behaviors and stress, anxiety, and depression.

Mobbing is a phenomenon that many employees, especially young and talented employees, have a considerably high potential to be exposed to. As it is understood from the literature, the primary

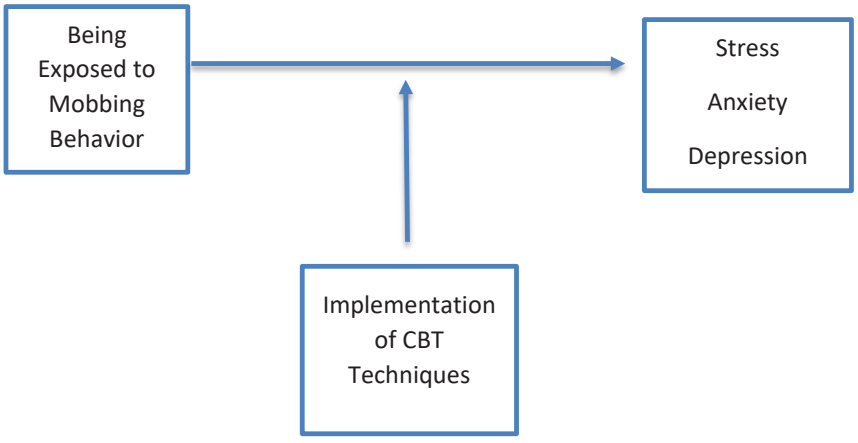

Figure 1. Proposed research model.

purpose of mobbing is to break the victims' self-confidence and make them move away from the workplace. People who apply mobbing can use such behaviors for many purposes. Some of the antecedents may be having a narcissistic personality and therefore removing all employees who may be competitors in the future or having an antisocial personality and not seeing any harm in exhibiting mobbing behaviors. Some behaviors exhibited by mobbing types in the literature may be compatible with these structures. When the individuals subjected to mobbing have the belief of insecurity and inadequacy desired by the other party, they experience negative situations experienced after mobbing more in the process, which can put the person in a vicious circle. Intervening with cognitive-behavioral techniques to address the inadequacy and worthlessness beliefs that the victim will experience will positively affect the mental health of the employees and the institutions. In this context, employing individuals specializing in clinical psychology in workplaces will be essential to preventing mobbing-like incidents.

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