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RESEARCH ARTICLES

REVIEWS

Research Article DOI: 10.62425/esbder.1488158

Surgical Fear and Related Factors Before Total Knee Arthroplasty

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ABSTRACT

Objective: The aim of this descriptive study was to determine the level of surgical fear and related factors in patients undergoing total knee arthroplasty.
Methods: The study sample consisted of 181 patients undergoing total knee arthroplasty in a training and research hospital in Izmir. The data were collected between April 1 and September 1, 2023 via the "Patient Identification Form" and the "Surgical Fear Scale". Descriptive statistics, Mann Whitney U test, Kruskal Wallis test and Spearman correlation analysis were used to evaluate the data.
Results: The mean score on the Surgical Fear Scale was found to be 28.35 ± 16.89 (out of 80 points), indicating that the level of fear experienced by patients scheduled for total knee arthroplasty was relatively low. The mean scores for the short-term and long-term fear subscale of the Surgical Fear Scale (16.10 ± 9.91 and 12.24 ± 9.44 out of 40, respectively) also indicated that the short-term and long-term fear levels were low. The factors associated with the level of surgical fear were found to be previous knee surgery history and type of anesthesia (*p*: .001).
Conclusion: The study findings showed that patients undergoing total knee arthroplasty experienced low levels of fear and that previous knee surgery experience and type of anesthesia were associated with this fear. surgical fear levels.
Keywords: Fear, patient, total knee arthroplasty.

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Introduction

Total knee arthroplasty (TKA) is a surgical procedure that involves the implantation of prostheses on the weight-bearing surfaces of the knee joint. The primary objective of this procedure is to alleviate severe pain and disability in the knee region caused by advanced osteoarthritis, rheumatoid arthritis, post-traumatic osteoarthrosis, neuropathic joint diseases or failure of high tibial osteotomy (OECD, 2021). TKA is regarded as one of the most successful surgical procedures in the field of orthopaedics at present. Its application to an increasing number of patients each year is attributable to the rising global incidence of degenerative knee diseases (OECD, 2021). Nevertheless, it is important to note that this surgical procedure can be regarded as a crisis or a potentially traumatic event for patients (Sürme & Çimen, 2022).

Surgical fear is defined as an emotional reaction initiated on the determination of the date on which the patient is to undergo surgery. This reaction may continue to intensify until the patient's surgical procedure (Bağdigen & Karaman Özlü, 2018). A significant proportion of patients report experiencing surgical fear despite being aware that these are medically necessary for their treatment (Bağdigen & Karaman Özlü, 2018). Ruhaiyem et al. found that a significant majority of patients (88%) undergoing surgical procedures reported experiencing surgical fear (Ruhaiyem et al., 2016).

While experiencing a state of ill-health and subsequent hospitalisation, irrespective of the underlying cause, can engender feelings of fear, the prospect of undergoing an surgical procedure can evoke an even greater sense of fear (Theunissen et al., 2014). Surgical fear is an umbrella term encompassing a multitude of individual fears, which can be considered either in isolation or collectively. The predominant concern among patients is the anticipation of significant discomfort during the postoperative recovery period, often stemming from the fear of pain tolerance (Theunissen et al., 2014). Patients may also experience a range of other fears, including uncertainty, the prospect of anaesthesia, the possibility of being bedridden, the potential loss of consciousness, the risk of loss of body integrity, the prospect of blood transfusions, the discomfort of injections, and the possibility of death (Şahin Altun et al., 2017; Theunissen et al., 2014).

In the vast majority of cases, the fear expressed by patients prior to undergoing surgery is considered to be a natural response (Bağdigen & Karaman Özlü, 2018). Nevertheless, a high level of surgical fear has been demonstrated to have a detrimental effect on the postoperative recovery process (Bağdigen & Karaman Özlü, 2018; Theunissen et al., 2014).

The psychological stress response elicited by the surgical fear has been shown to induce an imbalance in the hemostatic system (Bağdigen & Karaman Özlü, 2018; Sürme & Çimen, 2022). Consequently, the postoperative recovery period is prolonged (Sürme & Çimen, 2022). It is important to note that the psychological stress response triggered by this fear can lead to various physiological complications. These include hyperglycaemia, heightened protein catabolism, and hypertension. (Bağdigen & Karaman Özlü, 2018; Sürme & Çimen, 2022). It has been documented that patients who experience surgical fear in the preoperative period demonstrate a decline in overall quality of life, accompanied by an escalation in postoperative hospital stay, morbidity and mortality rates (Bağdigen & Karaman Özlü, 2018). It has also been documented that a patient's surgical fear can lead to an increased consumption of anaesthetic agent during the procedure, as well as a heightened requirement for analgesics in the postoperative period (Bağdigen & Karaman Özlü, 2018).

The determination of the level of fear is an inadequate method for the management of the undesirable effects caused by surgical fear. Elimination of the fear will not be possible without identification of the underlying causes of surgical fear. In the context of surgical fear management, it is imperative to ascertain the factors that precipitate fear, in addition to the extent of the fear experienced (Taylan & Çelik, 2022). Determining the level of surgical fear and the factors affecting fear in the preoperative period is of great importance in order to provide the necessary data to improve surgical care and to plan targeted interventions. It has been demonstrated that this will also assist in the enhancement of patient outcomes, satisfaction and adherence to treatment (Theunissen et al., 2014; Sürme & Çimen, 2022; Taylan & Çelik, 2022).

A substantial number of studies have been conducted to investigate patients' levels of surgical fear prior to surgery (Demir & Yılmaz, 2022; Engel et al., 2023; Karabulut et al., 2023; Kaya & Karaman Özlü, 2019; Kılınç & Karaman Özlü, 2023; Sürme & Çimen, 2022; Şahin Altun et al., 2017; Taylan & Çelik, 2022). A significant proportion of these studies were undertaken in the domain of neurosurgery, caesarean section, mastectomy, day surgery and geriatric surgery (Can & Beydağ, 2023; Çolak & Vural, 2023; Engel et al., 2023; Karabulut et al., 2023; Sürme & Çimen, 2022). Moreover, a range of studies are conducted on all patients scheduled to undergo elective surgery, irrespective of the surgical procedure (Kaya & Karaman Özlü, 2019; Kılınç & Karaman Özlü, 2023; Şahin Altun et al., 2017). The extent of surgical fear in patients was reported as low in some studies, and as moderate in others. Nevertheless, the number of studies that have been conducted in order to ascertain the level of

fear experienced by individuals prior to undergoing TKA is limited (Dinç & Yılmaz Güven, 2023; Mete & Avcı Işık, 2020). In the aforementioned studies, the potential factors that may have influenced the degree of surgical fear were not thoroughly evaluated. The objective of this study was to ascertain the extent of surgical fear and its associated factors in patients undergoing TKA. The identification of this fear and the factors associated with it will provide a more complete understanding of the role of surgical nurses in ensuring the safety of patients.

The aim of this study was to determine the level of surgical fear and the factors affecting it in patients undergoing TKA.

Methods

Study Design

This study is a descriptive, cross-sectional study.

Setting

The study was conducted between 1 April 2023 and 1 September 2023 in the orthopaedics and traumatology clinic of a training and research hospital in Izmir.

Population and Sample of the Study

The population of the study consisted of 200 patients who were admitted to the orthopaedics and traumatology clinic between 1 April and 1 September 2023 to undergo TKA. The study was concluded with the participation of 181 patients. A total of 19 patients were excluded from the study due to their failure to consent to participate. The sample size of the study was determined by a priori power analysis. For this, the data in Dinç and Yılmaz Güven's (2023) study were taken as basis (Dinç & Yılmaz Güven, 2023). Assuming a Type I error of 0.05, a test power of 0.95 and an effect size of 0.64, the minimum required sample size was determined to be 166. However, in consideration of the potential for data loss, the target sample size was set at 180. In this direction, the study's sample size can be considered adequate.

Tools

The research data were collected with the "Patient Introduction Form" and "Surgical Fear Scale".

Patient Introduction Form: The researchers prepared the form in accordance with the literature review, and it was subsequently divided into two sections. The first comprised socio-demographic information, while the second section incorporated clinical characteristics. (Bağdigen & Karaman Özlü, 2018; Dinç & Yılmaz Güven, 2023; Theunissen et al., 2014). Socio-demographic characteristics included six questions aiming to determine the age, gender, marital status, educational level, employment and income status of the patients. In the clinical characteristics section, there were questions about the duration of hospital stay in the preoperative period, having a chronic disease, previous hospitalisation, history of surgery and TKA surgery, type of anaesthesia to be administered, American Society of Anaesthesiologists (ASA) Physical Status Classification System score, knowledge about TKA, source of information, pain intensity, and support received from relatives and nurses. Pain intensity was determined by visual analogue scale (VAS). Patients were asked to rate their pain intensity on a 10 cm long horizontal line between zero (no pain) and ten (unbearable pain).

Surgical Fear Scale (SFS): SFS was developed in 2014 by Theunissen et al (2014). The scale comprises eight questions with the objective of ascertaining the level of fear experienced by patients who are scheduled to undergo elective surgery. It consists of two sub-dimensions: fear of short-term (SFS-S) and long-term (SFS-L) consequences of the surgery. Fear of the short-term consequences of surgery includes fear of surgery, anaesthesia, postoperative pain and unpleasant side effects such as nausea and vomiting. The long-term consequences of the operation include fear of deteriorating health after the surgery and not being able to recover completely, fear that the surgery will be unsuccessful and that the recovery period will be long. Items 1 to 4 on the scale are indicative of the patient's fear of the short-term consequences of the surgery, while items 5 to 8 are indicative of the patient's fear of the long-term consequences of the surgery. The total score that can be obtained from each sub-dimension of the scale varies between 0-40. The scale is an 11-point Likert-type scale ranging from zero (I am not afraid at all) to 10 (I am very afraid). The total score that can be obtained from the scale varies between 0-80. An increase in the score is indicative of an increase in the level of surgical fear experienced by patients. The internal consistency Cronbach's alpha coefficient of the scale was 0.89, 0.86 for the short-term outcomes (SFS-S) sub-dimension, was found to be 0.87 for the long-term outcomes (SFS-L) sub-dimension. The Turkish validity and reliability study of SFS was conducted by Bağdigen and Karaman Özlü in 2017. In the adaptation study, Cronbach's alpha value was calculated as 0.93 for the total scale, 0.96 for SFS-S and 0.90 for SFS-L (Bağdigen & Karaman Özlü, 2018). In this study, the Cronbach alpha reliability coefficient of the total scale was calculated as 0.81.

Procedure

The data were collected via face-to-face interviews, held one day prior to the operation, when the patients were in a state of comfort. It took approximately 7-10 minutes for the patients to fill out the forms.

Data Analysis

Descriptive statistics (number, percentage, mean, standard deviation, minimum and maximum) were used to evaluate the data obtained from the study. Normality assumption was checked by Shapiro Wilk test. Mann Whitney U, Kruskal Wallis test and Spearman Correlation analysis were used to evaluate the data obtained from the study. Analyses were performed using IBM SPSS 25 (IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.) programme.

Ethical Consideration

Ethics committee approval was received for this study from the ethics committee of Izmir Bakircay University (Date: March 15, 2023, Number: 920). Written permission was obtained from the chief physician of the hospital where the study would be conducted and from the patients. The study was conducted in accordance with the Declaration of Helsinki. In order to use the SFS in the study, permission was obtained by e-mail from the authors involved in the adaptation of the scale into Turkish.

Results

The mean age of the patients included in the study was 68.54±7.06 (min: 43 max: 88) years (Table 1).

Table 1.
Descriptive Characteristics of Patients

Characteristics	Number	Percentage
Gender		
Man	37	20.4
Woman	144	79.6
Marital status		
Single	48	26.5
Married	133	73.5
Education level		
Illiterate	32	17.7
Primary education	102	56.4
Secondary education	18	9.9
High school	17	9.4
Licence	12	6.6
Employment status in a regular job		
Yes	47	26.0
No	134	74.0
Income status		
Income less than expenditure	77	42.5
Income equals expenditure	88	48.6
Income more than expenditure	16	8.8
Total	181	100

The mean preoperative hospital stay of the patients was 1.7±1.23 (min: 0 max: 9) days. The mean preoperative pain intensity of the patients was 6.88±2.77 (min: 0 max: 10) out of ten. The mean support score of the patients received from their relatives in the preoperative period was 9.02±1.62 (min: 0 max: 10) and the mean support score of the patients received from nurses was 9.02±1.33 (min: 0 max: 10). The distribution of the patients according to their clinical characteristics is shown in Table 2.

Table 2.
Clinical Characteristics of Patients

Variable	Number	Percentage
Having comorbidities		
Yes	144	79.6
No	37	20.4
Comorbidity*		
Neurological Diseases	8	4.4
Chronic obstructive pulmonary disease/asthma	11	6.1
Cardiovascular Diseases	16	8.8
Diabetes	49	27.1
Hypertension	120	66.3
History of hospitalization		
Yes	142	78.5
No	39	21.5
History of surgery		
Yes	122	67.4
No	59	32.6
History of total knee arthroplasty		
Yes	63	34.8
No	118	65.2
Type of anesthesia planned for the surgery		
Spinal	17	9.4
Combined	24	13.3
Epidural	59	32.6
General	81	44.8
ASA score		
1	6	3.3
2	141	77.9
3	34	18.8
Knowledge of the surgery to be performed		
Yes	161	89.0
No	20	11.0
Source of information about the surgery*		
Television	4	2.2
Internet	9	5.0
Family members/friends	36	19.9
Physician	131	72.4
Nurse	131	72.4

*It was indicated that multiple responses were provided.

Table 3.
Distribution of Surgical Fear Scale Mean Scores According to Different Socio-demographic Variables

Variable	Short Term Fear Subscale Mean ± SD	Long-term Fear Subscale Mean ± SD	SFS Total Score Mean ± SD
Gender			
Woman	16.94±9.89 (min:0 max: 40)	12.17±9.42 (min:0 max: 40)	29.11±16.97 (min:0 max: 72)
Man	12.86±9.39 (min:0 max: 40)	12.51±9.65 (min:0 max: 36)	25.38±16.50 (min:0 max: 72)
	U: 2012.5 p: 0.022	U: 2609.0 p: 0.846	U: 2351.5 p: 0.271
Marital status			
Single	15.48±9.68 (min:0 max: 40)	12.35±9.42 (min:0 max: 40)	27.83±16.73 (min:0 max: 71)
Married	17.83±10.41 (min:0 max: 40)	11.96±9.60 (min:0 max: 32)	29.79±17.45 (min:1 max: 72)
	U: 2847.0 p: 0.267	U: 3154.5 p: 0.904	U: 3063.0 p: 0.678
Education level			
Illiterate	12.88±8.68 (min:0 max: 29)	11.88±10.78 (min:0 max: 35)	24.75±18.25 (min:0 max: 62)
Primary education	16.82±9.68 (min:0 max: 40)	13.25±9.47 (min:0 max: 40)	30.07±17.16 (min:0 max: 72)
Secondary education	13.89±5.20 (min:7 max: 29)	11.56±8.38 (min:0 max: 36)	25.44±9.55 (min:10 max: 45)
High school	17.94±12.43 (min:0 max: 40)	10.35±7.10 (min:0 max: 25)	28.29±17.71 (min:0 max: 65)
Licence	19.33±14.39 (min:0 max: 40)	8.42±9.70 (min:0 max: 23)	27.75±18.76 (min:0 max: 53)
	X^2: 6.001 p: 0.199	X^2: 4.189 p: 0.381	X^2: 3.701 p: 0.448
Employment status in a regular job			
Yes	16.81±8.28(min:3 max: 40)	11.98±7.31 (min:0 max: 32)	28.79±14.56 (min:6 max: 72)
No	15.86±10.43 (min:0 max: 40)	12.34±10.11 (min:0 max: 40)	28.19±17.69 (min:0 max: 71)
	U: 2976.5 p: 0.576	U: 3096.5 p: 0.865	U: 3089.50 p: 0.967
Income status			
Income less than expenditure	16.73±9.52 (min:0 max: 40)	13.82±9.71 (min:0 max: 40)	30.55±16.76 (min:0 max: 72)
Income equals expenditure	15.50±10.24 (min:0 max: 40)	11.13±9.14 (min:0 max: 32)	26.63±17.19 (min:0 max: 72)
Income more than expenditure	16.44±10.31 (min:3 max: 40)	10.81±9.25 (min:0 max: 30)	27.25±15.60 (min:6 max: 54)
	X^2: 0.745 p: 0.689	X^2: 3.170 p: 0.205	X^2: 2.077 p: 0.354
Having comorbidities			
Yes	15.72±9.51 (min:0 max: 40)	12.22±9.44 (min:0 max: 40)	27.94±16.56 (min:0 max: 71)
No	17.62±11.32 (min:0 max: 40)	12.32±9.60 (min:0 max: 35)	29.95±18.29 (min:0 max: 72)
	U: 2476.5 p: 0.509	U: 2628.5 p: 0.900	U: 2587.5 p: 0.788
History of hospitalization			
Yes	16.19±9.86 (min:0 max: 40)	12.59±9.92 (min:0 max: 40)	28.78±17.17 (min:0 max: 72)
No	15.79±10.18 (min:0 max: 40)	10.97±7.44 (min:0 max: 32)	26.77±15.96 (min:0 max: 72)
	U: 2686.0 p: 0.774	U: 2563.0 p: 0.476	U: 2577.5 p: 0.509
History of surgery			
Yes	15.70±9.98 (min:0 max: 40)	11.57±9.92 (min:0 max: 40)	27.28±17.16 (min:0 max: 71)
No	16.93±9.78 (min:0 max: 40)	13.63±8.28 (min:0 max: 32)	30.56±16.25 (min:0 max: 72)
	U: 3352.5 p: 0.455	U: 3057.0 p: 0.100	U: 3244.0 p: 0.282
History of total knee arthroplasty			
Yes	13.30±9.49 (min:0 max: 40)	8.56±9.22(min:0 max: 40)	21.86±16.09 (min:0 max: 65)
No	17.60±9.83 (min:0 max: 40)	14.21±9.00 (min:0 max: 36)	31.81±16.34 (min:0 max: 72)
	U: 2784.5 p: 0.005	U: 2300.0 p: 0.0001	U: 2427.0 p: 0.0001
Type of anesthesia planned for the surgery			
General	15.62±6.99 (min:0 max: 35)	13.93±6.86 (min:0 max: 36)	29.54±10.90 (min:6 max: 63)
Spinal	12.71±10.61 (min:1 max: 36)	8.82±11.74 (min:0 max: 14)	21.53±17.71 (min:1 max: 36)
Epidural	18.68±11.86 (min:0 max: 40)	12.34±10.02 (min:0 max: 33)	31.02±19.82 (min:0 max: 72)
Combined	13.83±11.53 (min:0 max: 30)	8.75±12.41 (min:0 max: 35)	22.58±22.80 (min:0 max: 62)
	X^2: 6.022 p: 0.111	X^2: 14.450 p: 0.002	X^2: 8.231 p: 0.041
ASA score			
1	13.00±11.42 (min:0 max: 28)	9.00±10.26 (min:0 max: 28)	22.00±20.07 (min:0 max: 54)
2	16.16±9.85 (min:0 max: 40)	11.73±9.13 (min:0 max: 35)	27.89±16.83 (min:0 max: 72)
3	16.41±10.10 (min:0 max: 40)	14.94±10.30 (min:0 max: 36)	31.35±16.64 (min:0 max: 65)
	X^2: 0.872 p: 0.647	X^2: 3.916 p: 0.141	X^2: 2.197 p: 0.333
Knowledge of the surgery to be performed			
Yes	15.93±9.60 (min:0 max: 40)	12.09±9.41 (min:0 max: 40)	28.02±16.70 (min:0 max: 72)
No	17.50±12.31 (min:0 max: 40)	13.50±9.88 (min:0 max: 33)	31.00±18.60 (min:3 max: 71)
	U: 1555.5 p: 0.805	U: 1512.0 p: 0.656	U: 1497.0 p: 0.609

In this study, the total score of the SFS was 28.35±16.89 (min: 0 max: 72), the SFS-S subscale score was 16.10±9.91 (min: 0 max: 40) and the SFS-L subscale score was 12.24±9.44 (min: 0 max: 40). These scores showed that the surgical fear level of the patients was low (not shown in the Table).

A statistically significant difference was obtained between the mean total scores of the Short-Term Fear subscale according to gender (p<.05). The mean score of women was higher than the mean score of men (Table 3).

In this study, a statistically significant difference was found between the mean scores of the subscale and total scores of the SFS according to the status of previous knee surgery (p<.05). The mean scores of SFS sub-dimension and total scores of people who had not had knee surgery before were higher than the mean scores of people who had knee surgery (Table 3).

A statistically significant difference was determined between the type of anaesthesia planned to be administered in the surgery and the mean total score of the Surgical Fear scale (p<.05). According to Bonferroni tests, statistically significant differences were found between combined and spinal anaesthesia types and general and epidural anaesthesia types. The mean scale scores of general and epidural anaesthesia types were higher than the mean scale scores of combined and spinal anaesthesia types (Table 3).

The relationship between the Surgical Fear scale and its sub-dimensions and the scores of age, length of hospital stay, pain intensity, and support from relatives and nurses is shown in Table 4. A statistically significant, negative and low-level relationship was found between the mean score of the long-term fear subscale and the duration of hospital stay (r: -0.184 p: .013), the support provided by relatives (r: -0.195 p: .009) and the support provided by nurses (r: -0.242 p: .001). A statistically significant, positive and low-level relationship was determined between the preoperative pain intensity and the mean score of the long-term fear subscale (r: 0.176 p: .018).

Table 4.
The Relationship Between Surgical Fear Scale and Its Subscales and Age, Length of Hospital Stay, Pain Severity, Relative and Nurse Support Ratings

Age	r	-0.041	0.0001	-0.020
	p	0.588	0.998	.789
Duration of hospitilization	r	0.001	-0.184	-0.112
	p	0.986	0.013	.135
Pain intensity	r	-0.035	0.176	0.087
	p	0.636	0.018	.244
Support from relatives	r	-0.062	-0.195	-0.116
	p	0.408	0.009	.119
Support from nurses	r	-0.003	-0.242	-0.102
	p	0.966	0.001	.172

Discussion

Surgical fear is an emotional reaction that has been observed in a significant number of patients prior to undergoing surgery (Bağdigen & Karaman Özlü, 2018). It is an anticipated response that patients will experience feelings of surgical anxiety during the preoperative period. However, elevated levels of fear can result in numerous complications, including increased mortality and morbidity rates, prolonged recovery periods, and extended hospitalisation durations (Bağdigen & Karaman Özlü, 2018). In this study, it was found that patients undergoing TKA experienced a mild level of surgical fear (28.35±16.89). In similar studies conducted with patients undergoing TKA, it was determined that the level of surgical fear of patients was low (Dinç & Yılmaz Güven, 2023; Mete & Avcı Işık, 2020). The present findings are consistent with the conclusions of previous research. However, the surgical fear levels of patients who will undergo general surgery (56.27±18.18), caesarean section (51.14±8.88), septorhinoplasty (46.8±23.4), elective surgery (37.5±21.11) are higher than the fear level obtained in this study (Can & Beydağ, 2023; Demir & Yılmaz, 2022; Karabulut et al., 2023; Kaya & Karaman Özlü, 2019). The period between the decision being made about TKA surgery and the operation being performed is longer than for similar elective surgical procedures. Furthermore, patients have been found to experience prolonged periods of discomfort. The performance of stair-climbing, walking and bending movements is impaired in patients due to pain. Patients regard TKA as being a last resort for the alleviation of pain and the enhancement of autonomy in movement. It is hypothesised that all of these factors may have an impact on the level of fear experienced by patients.

The mean short-term surgical fear levels (16.10 ± 9.91) were observed to be higher than the long-term fear levels (12.24 ± 9.44) of the patient cohort prior to TKA surgery. As

indicated in the relevant literature, studies have demonstrated that patients experience elevated levels of short-term surgical fear in comparison to long-term fear levels, irrespective of the surgical intervention (Akutay & Ceyhan, 2023; Can & Beydağ, 2023; Dinç & Yılmaz Güven, 2023; Engel et al., 2023; Kaya & Karaman Özlü, 2019; Taylan & Çelik, 2022). This indicates that patients experience heightened levels of fear with regard to surgery, anaesthesia, postoperative pain and potential side effects. This is an expected finding. Because it is known that patients who will undergo surgery have higher short-term fear levels due to reasons such as uncertainty, loss of control, pain expectation and having previous negative experiences. In this study, it is thought that the feeling of uncertainty about the intraoperative and postoperative period may have increased the short-term surgical fear levels of the patients. Encouraging patients to express their fears in the preoperative period and planned trainings in this direction may help to reduce patients' fears.

Short-term fear levels of female patients were significantly higher than those of male patients. As indicated by the extant literature, female patients exhibit elevated mean short-term fear scores in the preoperative period when compared to male patients (Demir & Yılmaz, 2022; Kılınç & Karaman Özlü, 2023; Sürme & Çimen, 2022). This phenomenon may be attributable to the hypothesis that females exhibit heightened levels of emotionality and fragility, consequent to variations in estrogen and progesterone hormonal levels. In addition, it has been stated that being away from home and family, especially children, during the surgical process may cause more fear in women (Kaya & Karaman Özlü, 2019; Kılınç & Karaman Özlü, 2023). The present situation indicates that further interventions are required in order to address the issue of short-term surgical fears experienced by female patients. In addition, it is thought that the fact that male patients hesitate to express their fears due to the structure of Turkish society may also cause this result. In this context, it is recommended that male patients receive more intensive encouragement to articulate their fears regarding surgery during the preoperative period. The establishment of a relationship based on trust with patients and the ensuring of open communication are prerequisites for this. Patients may be posed open-ended questions with a view to encouraging the expression of their feelings. Patients' awareness that surgical fear is a prevalent condition has the potential to engender a sense of increased ease and comfort.

In the present study, it was determined that the history of surgery did not have any significant impact on the manifestation of surgical fear. In addition, it was determined that the mean scores of the subscale and total scores of the SFS were significantly higher in patients who had not undergone TKA before. Similar to this study, Can and Beydağ determined that having undergone the planned surgery before decreased the level of surgical fear (Can & Beydağ, 2023). This finding indicates that patients who have previously undergone the same surgical procedure may exhibit reduced levels of fear, potentially attributable to enhanced comprehension of the anticipated experience, encompassing the recovery process and potential outcomes. In this regard, it is recommended that patients undergoing TKA for the first time receive enhanced support to facilitate their navigation of the fear of uncertainty.

As demonstrated in extant literature, the level of surgical fear has been shown to increase in direct proportion to the duration of hospitalisation in the preoperative period (Kaya & Karaman Özlü, 2019; Sürme & Çimen, 2022). In this study, on the contrary, it was determined that the long-term surgical fear levels of the patients decreased statistically significantly as the duration of hospital stay increased in the preoperative period. In this study, patients' long-term surgical fear may have decreased with prolonged preoperative hospital stay due to various factors. It can be hypothesised that increased time spent in the hospital environment may have reduced patients' fears by providing an opportunity for familiarisation with the surroundings, staff and procedures. Furthermore, extended stays may have afforded patients more opportunities for interaction with healthcare professionals, enabling them to solicit guidance and address concerns. Conversely, as the duration of hospitalisation increases, the efficacy of preoperative patient preparation and education may be enhanced. The combination of these factors may have contributed to patients feeling more informed, supported, and prepared for surgery, thereby reducing their fears.

The present study revealed a statistically significant negative and low-level relationship between the support provided to patients by relatives and nurses and the long-term fear subscale mean scores. This finding suggests that the provision of support from relatives and nurses of patients scheduled to undergo TKA is associated with a reduction in long-term surgical fear. It is also stated in the literature that an increase in preoperative social support is associated with a decrease in surgical fear levels among patients (Kaya & Karaman Özlü, 2019; Koivula et al., 2002). Our findings are parallel to the literature. These findings show that social support is an important factor in reducing surgical fear.

There are some limitations that should be taken into

consideration in this study. The first limitation is that the study was conducted in a single center and only with patients who would undergo TKA. Therefore, the results cannot be generalized to all patients. The study includes descriptive and disease-related findings that affect the surgical fear levels of the patients. Another limitation is that physical, environmental, psycho-spiritual or socio-cultural parameters that may affect surgical fear were not included in the study. This should not be ignored when evaluating the results of the study.

Conclusion and Recommendations

This study showed that patients undergoing TKA experienced mild fear. It was determined that gender, history of TKA, type of anesthesia, length of hospital stay before surgery, pain intensity, support from patient relatives and nurses were factors associated with short-term or long-term surgical fear levels. Establishing protocols and organizing educational programs to control these factors associated with surgical fear will contribute to patient safety and desired patient outcomes by reducing surgical fear. In addition, providing psychosocial support is also important in reducing long-term surgical fear.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Izmir Bakircay University (Date: March 15, 2023, Number: 920).
Informed Consent: Written consent was obtained from patients.
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Author Contributions: Concept – AOA, EK; Design - AOA, EK; Supervision - AOA; Resources - AOA, EK; Materials - AOA, EK; Data Collection and/or Processing - EK; Analysis and/or Interpretation - AOA, EK; Literature Search - AOA, EK; Writing Manuscript - AOA, EK; Critical Review - AOA
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Evaluation of Nurses' Needlestick and Sharps Injury Status, Reporting Frequency and Post-Injury Practices

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ABSTRACT

Objective: The aim of this study is to identify the causes and frequency of needlestick and sharp injuries among nurses and to examine their knowledge and practices following these injuries.
Methods: The population of the study consisted of 1,550 nurses working at a state and a university hospital located in a city center. The sample included 478 nurses, aged between 18 and 60, who were actively working and volunteered to participate in the study between September 1, 2019, and December 31, 2019. A survey assessing sociodemographic characteristics, the frequency of needlestick and sharp injuries, and post-injury practices was administered to the voluntarily participating nurses. The data were analyzed using the SPSS 25 software program.
Results: It was determined that 45.6% of the nurses experienced sharps ınjury 2-5 times in their working life, and 67.8% of them had sharps injury in the last year. It was determined that 71.3% of these injuries were caused by injector needles, and 50.8% of them were caused by fast movement. It was determined that 58.8% of the nurses washed the injured area with soap and water as an intervention after a sharp object injury.
Conclusion: A high rate of needlestick and sharp injuries was found among nurses, and it was determined that the reporting rates of these injuries were low.
Keywords: Employee safety, needlestick and sharps device injury, nursing.

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Introduction

Hospitals are institutions that fall into the high-risk category in terms of working conditions (Gürer, 2018). Healthcare professionals, who are dedicated to providing health services to society, are at the center of these hazardous work environments and constitute one of the groups most at risk of occupational accidents. When healthcare workers experience occupational accidents due to potential risks and hazards in hospital work environments, it leads to significant issues such as loss of health, disability from a human, social, and psychological perspective, and income loss from an economic standpoint (Dikmen et al., 2014). Healthcare workers face numerous risks in their work environments, with the most common occupational accidents being sharps injuries (Yazar et al., 2016). Needlestick and Sharps injuries (NSI) are among the most significant occupational risks for healthcare workers and cannot be overlooked (Omaç et al., 2010). Among healthcare workers, nurses are particularly at higher risk of encountering health hazards due to spending more time with patients and providing direct care (Parlar, 2008). Nurses, being the occupational group most exposed to these risks, frequently experience needlestick and sharps injuries. This is extremely important, especially because nurses are at high risk of exposure to infections transmitted through blood and body fluids as a result of NSI (Olgun et al., 2014). Nurses are at high risk of exposure to blood and bodily fluids and are vulnerable to approximately 20 pathogens, including Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), and Human Immunodeficiency Virus (HIV), which can be transmitted through contact with contaminated sharps injuries (Coppola et al., 2016).

According to data from the Centers for Disease Control and Prevention (CDC), exposure to blood and bodily fluids due to injuries is most commonly reported among nurses (53%), with the most frequent causes of injury being disposable syringes (27%) and suture needles (25%) (CDC, 2016). In terms of materials causing injuries, hospitals have numerous instruments and procedures that can lead to needlestick and sharps injuries. These procedures include blood collection, IV catheter insertion, and the use of scalpels during dressings, with the most common injuries occurring during the recapping of syringe needles (Okutan et al., 2018; Samancıoğlu et al., 2013). Other studies have found that needlestick and sharps injuries most frequently result from needle sticks (40-70%), followed by ampoule cuts (Menteşe & Karaca, 2021; Oluwatosin et al., 2016; Omaç et al., 2010; Yelgin et al., 2018; Yoldaş et al., 2014; Zhang et al., 2018).

The frequency of needlestick and sharps injuries among nurses is attributed to their excessive workload, the rapid pace of patient turnover leading to hasty movements, and the long hours of shifts causing attention lapses. Despite the high frequency of needlestick and sharps injuries among nurses, literature indicates that reporting rates for such injuries remain low (Kurttekin et al., 2020). In this context, considering that Turkiye has ten times more HBV carriers than the United States, it is not difficult to estimate the magnitude of the danger for healthcare professionals in our country (Omaç et al., 2010).

Occupational accidents resulting from deficiencies in occupational health and safety in the healthcare sector are a significant health problem that requires study and planning, given the health, social, and economic losses they cause (Dikmen et al., 2014). Nurses face serious dangers and risks in their work environments, including needlestick and sharps injuries and infectious diseases. To ensure the delivery of safe and quality-standard services to patients, healthcare professionals must also be healthy and have their occupational safety ensured. In this regard, the health and safety of healthcare professionals is a critical issue that requires careful attention (Solmaz et al., 2017; Menteşe & Karaca, 2021; Zhang et al., 2017). In light of this information, this study was conducted to examine the causes and frequency of needlestick and sharp injuries among nurses, their reporting status, the practices they perform after such injuries, and to compare the data obtained in the study with hospital records through a retrospective evaluation.

Research Questions

1. What is the frequency of needlestick and sharps injuries among nurses?
2. What are the causes of needlestick and sharps injuries among nurses?
3. What are the practices followed by nurses after experiencing a needlestick and sharps injury?
4. What is the reporting status of needlestick and sharps injuries among nurses?
5. What are the reasons for nurses not reporting needlestick and sharps injuries?

Methods

Research Design

This study consists of two phases. The first phase was descriptive, while the second phase was conducted retrospectively.

Study Setting

This study was conducted between September 1, 2019, and December 31, 2019, at various healthcare institutions located in a city center, including a University Health

Research and Practice Center, a Training and Research Hospital, State Hospitals, and a Maternity and Women's Hospital.

Study Population and Sample

The study population comprised a total of 1,550 nurses working in the following institutions: 562 nurses at the University Health Application and Research Center, 129 nurses at the State Hospital, 701 nurses at the Training and Research Hospital, 52 nurses at the Maternity Hospital, and 106 nurses at another State Hospital. The study sample consisted of 478 nurses aged 18–60 who were actively working in the specified hospitals and agreed to participate in the study between September 1, 2019, and December 31, 2019. The inclusion criteria were being aged 18–60, voluntary participation, and active employment.

Data Collection Tools

Sociodemographic Form

Developed by the researchers, this form includes questions about the nurses' age, gender, education level, workplace, years of experience, etc.

Needlestick and Sharps Injuries Survey Form

Developed based on the literature (Dişbudak, 2013; Kaya et al., 2012; Musa et al., 2014; Okutan et al., 2018; Olgun et al., 2014), this form consists of 26 questions assessing the frequency of needlestick and sharps injuries among nurses and their post-injury practices.

Annual Needlestick and Sharps Injuries Data Reporting Form

Also developed based on the literature (Dişbudak, 2013; Kaya et al., 2012; Musa et al., 2014; Okutan et al., 2018; Olgun et al., 2014), this form records needlestick and sharps injury reports in hospitals, including the instruments causing the injuries, the nature of the incidents, and the number of injuries.

Data Collection

The research data were collected in two phases.

Phase 1 of the Research;

Nurses who voluntarily participated in the study were administered a survey assessing sociodemographic characteristics, the frequency of sharps injuries, and post-injury practices. Prior to the survey, nurses were informed about the study, and data were collected through face-to-face interviews using informed consent forms.

Phase 2 of the Research;

Annual needlestick and sharps injury reports were obtained from the hospitals involved in the study. The data were officially acquired via mail from the institutions. The information from these records was documented in the needlestick and sharps injury reporting form in accordance with permissions.

Data Analysis

The data were analyzed using SPSS 25 (IBM SPSS Corp., Armonk, NY, USA) software. Descriptive statistics, including percentages, means, standard deviations, and chi-square tests, were used to evaluate the study data.

Ethical Consideration

Ethical approval was obtained from the Non-Interventional Clinical Research Ethics Committee of Atatürk University to conduct the study (Date: 22/04/2019; Approval No: B.30.2.ATA.0.01.00/184). Institutional permissions were also secured from the hospitals involved. Participants were assured that their data would be protected and used solely for the purposes of this study. Data obtained from hospital records were analyzed without disclosing hospital names, and ethical principles were strictly adhered to. All steps of the study were carried out in accordance with the Declaration of Helsinki.

Results

The findings obtained within the scope of the research are presented with tables.

The findings obtained within the scope of the research are presented alongside tables. When examining the distribution of the descriptive characteristics of the nurses included in the study (Table 1), it was found that the majority of the nurses (46.2%) were in the age range of 25-29 years, 61.7% were graduates of a bachelor's degree program, 39.8% were employed at a training and research hospital, 68% worked in shifts, 63.4% were aware of the existence and activities of the infection control committee at their institution, and 83.1% had received training regarding needlestick and sharp injuries. The average age of the nurses included in the study was determined to be 27.62±5.62 years, while the average years of employment was 5.69±5.24 years.

When examining the distribution needlestick of sharp object injury incidents among nurses (Table 2), it was found that 45.6% of the nurses had experienced sharp object injuries 2-5 times during their professional careers, and 67.8% had encountered such incidents within the past year. Among these nurses, 32.4% reported having sustained an injury once in the past year, with 71.3% of these injuries occurring due to a syringe needle. Additionally, 64.9% of the injuries happened while preparing the patient for a procedure, and 50.8% were attributed to the nurses moving quickly.

Table 1.
Distrubution of Nurses' Demographic Characteristics

Characteristics	n	%
Age		
20-24	133	27.8
25-29	221	46.2
30-34	66	13.8
35 and above	58	12.2
Gender		
Female	386	80.8
Male	92	19.2
Education		
Health Vocational High School	88	18.4
Associate Degree	74	15.5
Bachelor's Degree	295	61.7
Master's Degree and Above	21	4.4
Institution Worked		
University Hospital	123	25.7
Training and Research Hospital	190	39.8
State Hospital	165	34.5
Years of Work Experience		
1-5 years	306	64.0
6-10 years	109	22.8
11-15 years	35	7.3
16 years and above	28	5.9
Work Type		
Continuous Day Shift	113	23.6
Continuous Night Shift	40	8.4
Shift Work	325	68
Awareness of Infection Control Committee in the Institution		
None	3	0.6
Unknown	25	5.2
Exists (those unaware of its work)	147	30.8
Exists (those aware of its work)	303	63.4
Training on Needlestick and Sharp Object Injuries		
No	81	16.9
Yes	397	83.1

Furthermore, it was determined that 44.1% of the nurses included in the study had sustained injuries from contaminated sharp objects with patient body materials within the past year, and 79% collected information about the patient following the injury.

Notably, 99% of the nurses reported that they had not contracted an infectious disease as a result of needlestick sharp object injuries, while 58.8% indicated that they washed the injured area with soap and water as a post-injury intervention.

Table 2.
Distribution of Needlestick and Sharps Injury Incidents Among Nurses

Needlestick and Sharp Injury Incidents	n	%
Number of Needlestick and Sharp Injuries in Professional Life		
Never exposed	72	15.1
Once	72	15.1
2-5 times	218	45.6
6-10 times	78	16.3
11-20 times	22	4.6
21 times and above	16	3.3
Needlestick and Sharps Injury Experience in the Last Year		
No	154	32.2
Yes	324	67.8
Number of Needlestick and Sharp Injuries in the Last Year (n=324)		
1	105	32.4
2	94	29.0
3	54	16.7
4	22	6.8
5 or more	49	15.1
Devices Causing Needlestick and Sharp Injuries in the Last Year (n=324)		
Injector needle	231	71.3
Suture needle	12	3.7
İV catheter	12	3.7
Ampoule	57	17.6
Other (Lancet, scalpel, etc.)	12	3.7
Situations Where Needlestick and Sharp Injuries Occurred Most Frequently in the Last Year (n=324)		
Preparing for a procedure on the patient	210	64.9
During the procedure on the patient	52	16.0
After the procedure on the patient	62	19.1
Reasons for Needlestick and Sharp Object Injuries in the Last Year (n=324)		
Carelessness	114	35.3
Quick movement	164	50.8
Fatigue	26	8.0
Material structure	13	4.0
Excessive workload	6	1.9
Exposure to Contaminated Needlestick and Sharp Objects with Patient Body Fluids in the Last Year		
No	181	55.9
Yes	143	44.1
Information Gathering About the Patient After Exposure to Contaminated Needlestick and Sharp Objects (n=143)		
No	30	21.00
Yes	113	79.0
Infection Due to Needlestick and Sharp Object Injury		
No	401	99.0
Yes (Hepatitis B)	4	1.0
***Actions Taken After Exposure to Needlestick and Sharps Injury in the Last Year (n=324)**		
Did nothing	24	7.3
Bleeding the injured area	54	16.4
Washing the wound area with soap and water	194	58.8
Cleaning the wound area with antiseptic	38	11.4
Applying pressure to stop the bleeding	20	6.1

Table 3.
Distribution of Nurses' Reporting of Needlestick and Sharp Injuries

Reporting Status	n	%
Written Reporting of Needlestick and Sharps Injury Exposure (n=324)		
No	188	58
Yes	78	24.1
Sometimes	58	17.9
Reporting Contaminated Needlestick and Sharp Object Injuries with Patient Body Fluids in the Last Year		
No	100	69.9
Yes	43	30.1
***Reasons for Not Reporting Contaminated Needlestick and Sharp Object Injuries (n=100)**		
Unawareness of reporting necessity	33	23.1
Time constraints	44	30.8
Indifference	37	25.9
Vaccination	29	20.3

*More than one option can be selected.

The distribution of nurses' reporting of needlestick and sharp object injuries is presented in Table 3. It was found that 58% of the nurses did not submit a written report when experiencing a needlestick and sharp object injury. Furthermore, 69.9% did not report exposures to contaminated needlestick and sharp objects with patient body materials within the past year, with the primary reason for not reporting being time constraints (30.8%).

When examining the distribution of needlestick and sharp object injury incidents among nurses based on units, hours, and materials (Table 4), it was found that 25.9% of the nurses experienced injuries while working in internal medicine units, and 50.6% reported injuries during the 08:00-16:00 shift.

Additionally, 66.9% of the nurses indicated that they were most frequently injured by syringe needles during their work, while 51.9% reported that they sustained injuries primarily while breaking ampoules in the past year. Notably, 88.1% of the nurses had not experienced injuries from contaminated needlestick and sharp objects with body fluids from patients with HIV, Hepatitis B, or Hepatitis C within the past year.

The distribution of personal protective equipment (PPE) usage among nurses is presented in Table 5. It was found that 93.7% of the nurses used PPE during needlestick and sharp object injuries, with 93% specifically using gloves as protective equipment during these incidents.

Table 4.
Distribution of Units, Hours, and Materials Where Nurses Experienced Needlestick and Sharp Injuries

Unit, Hour, and Material	n	%
Unit Where Needlestick and Sharp Injuries Occurred in the Last Year (n=324)		
Emergency Department	58	17.9
Surgical Unit	68	21.0
Internal Medicine Unit	84	25.9
Intensive Care Unit	75	23.1
Operating Room	27	8.3
Blood Collection	12	3.7
Working Hours When Needlestick and Sharp Injuries Occurred (n=324)		
08:00-16:00	164	50.6
16:00-24:00	133	41.1
00:00-08:00	27	8.3
***Devices Most Frequently Causing Needlestick and Sharp Injuries During Work**		
Injector needle	320	66.9
Suture needle	19	4
Ampoule	129	27
Lancet, scalpel	10	2.1
Procedures Causing Needlestick and Sharp Injuries in the Last Year (n=324)		
While drawing blood	49	15.1
While breaking an ampoule	168	51.9
While inserting an IV catheter	14	4.3
While putting the injector cap	37	11.4
While disposing of sharp objects in waste bins	12	3.7
While administering injections	6	1.9
During surgical procedures	26	8.0
Other (While collecting medical waste, while transferring blood from the syringe to tubes etc.)	12	3.7
Exposure to Contaminated Needlestick and Sharp Objects with Body Fluids of HIV, Hepatitis B, C Patients in the Last Year		
No	126	88.1
Yes	17	11.9

*More than one option can be selected.

Additionally, 69.7% reported that they always used PPE during invasive procedures, while 53.1% indicated that they were unable to use PPE due to a high workload and time constraints.

Annual Official Reporting Numbers of Needlestick and Sharp Injuries Reported by Nurses Working in State and University Hospitals in a City Center: 18 reports (36%) from Hospital A, 11 reports (22%) from Hospital B, 2 reports (4%) from Hospital C, 5 reports (10%) from Hospital D, and 14 reports (28%) from Hospital E, totaling 50 reports in one year.

Table 5.
Distribution of Nurses' Use of Personal Protective Equipment

Use of Protective Equipment	n	%
Use of Personal Protective Equipment During Needlestick and Sharp Injuries (n=143)		
No	9	6.3
Yes	134	93.7
Personal Protective Equipment Used During Needlestick and Sharp Injuries (n=143)		
Gloves	133	93.0
Double gloves	10	7.0
Frequency of Using Personal Protective Equipment During Invasive Procedures		
Always	333	69.7
Sometimes	134	28.0
Never	11	2.3
Factors Preventing the Use of Personal Protective Equipment		
Intense workload and lack of time	254	53.1
Insufficient tools and equipment	48	10.0
Belief that it hinders comfortable work	85	17.8
Not seeing the need due to vaccination	20	4.2
Lack of attention, forgetfulness	26	5.4
Allergy to the materials used	18	3.8
Knowing that the patient does not have an infectious disease	20	4.2
Other	7	1.5

*More than one option can be selected.

Discussion

Occupational accidents arising from deficiencies in occupational health and safety in every healthcare institution remain a global issue that needs attention due to the health, social, and economic losses they cause. Based on this, this research aims to identify the causes and frequency of sharp object injuries, examine the information and practices following the injuries, and retrospectively evaluate these notifications through hospital records for comparison with the relevant literature.

In this study, a significant majority of nurses (84.9%) reported having experienced at least one sharp object injury during their working life. In the study by Olgun et al. (2014), 75.2% of nurses stated that they had experienced at least one sharp object injury in the last three months, while in the study by Omaç et al. (2010), this figure was 62.7%. In the study by Benli et al. (2016), it was noted that sharp object injuries constituted 68.8% of occupational accidents experienced by hospital staff. The high rates of sharp object injuries among nurses pose a risk of transmission for many pathogens, primarily hepatitis and HIV, which are transmitted through blood and body fluids (Abebe et al., 2018). In this study, the sharp object causing injuries was identified as the syringe needle in the first place, followed by the ampoule (Table 2). In the literature, studies involving healthcare workers and nurses also indicate that injuries from syringe needles rank first (Güney et al., 2017; Olgun et al., 2014; Oluwatosin et al., 2016; Omaç et al., 2010; Samancıoğlu et al., 2013; Yazar et al., 2016; Yoldaş et al., 2014), and injuries from ampoules rank second (Güney et al., 2017; Olgun et al., 2014; Oluwatosin et al., 2016; Omaç et al., 2010). In the study by Satılmış and Şahin (2019), the instruments causing injury were found to be insulin needles in the first place and suture needles in the second place, with nurses being the most affected profession. In this study and the literature, needle-stick injuries are highlighted as a significant cause of sharp object injuries (Kepenek et al., 2017; Özer et al., 2020; Satılmış et al., 2019; Yelgin et al., 2018), drawing attention to the importance of this issue. The high incidence of injuries from syringe needles can be attributed to the frequent use of these tools by nurses during procedures such as injections, medication preparation, and blood draws, as well as their behavior when collecting waste after procedures.

When examining the circumstances under which injuries occurred, it was found that the majority of injuries among nurses occurred while preparing for procedures on patients; the leading causes of injury were identified as rapid movement and carelessness (Table 2). In two different studies, nurses indicated that the primary cause of their injuries was rapid movement (Mangırlı & Özşaker, 2014; Zahrah et al., 2012). One study found that injuries predominantly occurred while removing instruments from the environment and during the procedure (Özer et al., 2020), while another study indicated that injuries occurred first during the use of sterile instruments before treatment (Doğru et al., 2018), and yet another study noted that injuries were a result of carelessness during operations (Satılmış et al., 2019). It can be inferred that the prevalence of injuries among nurses due to workload and rapid movement is associated with the low number of nurses and the high number of patients per nurse. Injuries occurring before procedures may be perceived as low-risk by nurses due to the lack of contamination of materials; however, these injuries can still pose a risk for serious physical damage and the transmission of diseases due to the compromise of skin integrity, highlighting the importance of preventing all sharp object injuries.

In this study, nearly half of the injured nurses (44.1%) reported having sustained injuries with contaminated sharp objects involving patient body materials within the last year, with 79% of those who experienced contaminated injuries collecting information about the patient afterward.

Additionally, 99% of nurses indicated that they had not contracted an infectious disease as a result of sharp object injuries throughout their working lives (Table 2). When reviewing the literature, Omaç et al. (2010) reported that 24.6% of nurses who experienced sharp object injuries had contact with the patient's blood or body fluids, while Samancıoğlu et al. (2013) indicated that 21.2% of nurses injured by sharp objects had been injured by contaminated instruments. In a study involving 634 nurses from 13 Western European countries and Russia, it was reported that the source was known in 80% of cases, and nearly half (43%) indicated that the sharp object was contaminated (Costigliola et al., 2012). In the study by Guliyeva et al. (2016), it was found that 86% of healthcare personnel were aware of the source of the instrument causing injury. The high rate of data collection about patients after contaminated injuries in this study is a positive aspect in terms of the precautions to be taken after such injuries.

When examining post-injury practices in this study, it was found that nurses primarily reported washing the injured area with soap and water (58.8%), while 16.4% reported bleeding the injured area. The use of antiseptic solutions was found to be quite low (Table 2). In the study by Güney et al. (2017), the most commonly used practice post-injury was cleaning with povidone-iodine, followed by cleaning with liquid soap. In the studies conducted by Goel et al. (2017) in Northern India, healthcare workers were found to frequently clean the injured area with soap and water. The study by Dişbudak (2013) also revealed that nurses most commonly used antiseptics for washing after injuries, followed by washing with soap. When a sharp object injury occurs, the wound should be thoroughly washed with soap and water, and then an antiseptic solution should be applied. It is essential to avoid actions such as squeezing or bleeding the wound to prevent further trauma. Afterward, an occupational accident entry should be made in the emergency department, necessary examinations should be conducted, and the case should be referred to the occupational health unit and the infection control unit (Girgin et al., 2009; Official Gazette, 2012). Based on this, it can be inferred that nurses continue to engage in inappropriate practices post-injury, possibly due to hasty behavior, underestimating the injury, a lack of knowledge, or an inability to translate knowledge into action.

When examining the distribution of reporting sharp object injuries, it was found that more than half of the nurses (58%) did not submit a written report when experiencing an injury, and even among those who experienced contaminated sharp object injuries, only 30.1% reported the incident in the last year. The primary reason for not reporting contaminated sharp object injuries was identified as time constraints. Other reasons for not reporting included underestimating the injury, not knowing the necessity to report, and the presence of vaccination (Table 3). In the literature, Okutan and Sarıtaş (2018) reported that 59.6% of nurses did not report the injury, and 44.3% indicated that they did not report it because the instrument was not contaminated. Güney et al. (2017) found that 58.8% of emergency service workers did not report their injuries, with the reasons for not reporting being primarily due to the material not being infected, lack of time/concern, and unawareness of the need to report. In the study by Altıok et al. (2009), 87.3% of participants did not report sharp object injuries, stating that they were unaware of the necessity to report, did not feel concerned, and were unfamiliar with the process. Akkaya et al. (2014) indicated that 68% of injuries were not reported, and nearly half of the affected personnel reported that they did nothing after the injury. When asked about the reasons for not reporting, the most frequent response was "I considered it insignificant." Many studies have reported low reporting rates. In contrast, the study by Karacaer et al. (2018) found that the reporting rate to the Infection Control Committee was 68%, which stands out as a remarkably high reporting rate. The International Safety Center (EPINet-CDC, 2016) report states that percutaneous injuries are not reported adequately. Despite the high rates of injuries, the reporting rates remain low, with reasons for not reporting including lack of concern, time constraints, and unawareness of the need to report. A significant barrier to the success of prevention programs is the low reporting rates of reported sharp object injuries. Particularly, nurses who do not report after experiencing sharp object injuries represent a significant risk group for both individual and societal infection chains.

In this study, when examining the units where nurses experienced sharp object injuries in the last year, it was found that the most frequent injuries occurred in internal medicine units, intensive care, and surgical units, with injury rates being quite similar (Table 4). In the study by Özer et al. (2020), the most common units where healthcare workers were injured were identified as internal medicine, surgical units, and intensive care units. The study by Karabay et al. (2014) also found that the highest injuries occurred in intensive care and operating rooms. Comparing this research with similar studies, it can be observed that the units where sharp object injuries most frequently occur show both similarities and differences, and these rates may vary depending on the working conditions of these units, patient factors, working conditions, and various other variables.

When examining the time intervals during which nurses experienced sharp object injuries in the last year, it was determined that half of the nurses experienced injuries

during the 08:00-16:00 shift, while nearly half (41.1%) experienced injuries during the 16:00-24:00 shift (Table 4). Many studies have reported that sharp object injuries most frequently occur during the 08:00-16:00 working hours (Karakoç et al., 2018; Olgun et al., 2014; Özer et al., 2020; Yelgin et al., 2018). Similar studies have found that injuries most frequently occur on weekdays, during working hours, particularly in the morning. In a public and a private tertiary hospital in Lahore, Pakistan, the shift during which the most injuries occurred was reported to be the morning shift in both hospitals (Hassnain et al., 2017). In this study and many similar studies, a significant proportion of sharp object injuries occurred during daytime working hours. The higher incidence of injuries during daytime hours can be explained by the greater workload associated with procedures performed in hospitals during the day, as well as higher patient circulation and procedural activities, intense human traffic (visits, doctor rounds), and the operation of complex cases during daytime hours (Akyıldız, 2022; Omaç et al., 2010; Souza et al., 2014). The increased patient circulation and hospital admissions on weekdays due to outpatient services, surgeries, etc., can be related to the higher workload and the increased number of nursing interventions, including invasive procedures.

In this study, it was determined that the devices most frequently causing sharp object injuries among nurses during their working hours were syringe needles (66.9%) and ampoules (27%). Additionally, the most frequently reported procedure resulting in sharp object injuries in the last year was "breaking an ampoule" (Table 4). Other studies have indicated that the most common cause of injury was "closing the needle cap" (Akkaya et al., 2014; Kaya et al., 2012; Kepenek et al., 2017; Olgun et al., 2014; Yazar et al., 2016). Nurses play an indispensable role in all hospital units, performing care and treatment procedures due to the wide range of their job responsibilities. Since ampoules and syringe tips are among the most frequently used instruments by nurses, the high rates of injury can be attributed to workload, noncompliance with precautions, rapid movement, carelessness, and the lack of a culture of safe instrument usage.

In this study, when examining the use of personal protective equipment among nurses, it was found that nearly all nurses (93.7%) used personal protective equipment in the event of sharp object injuries, and virtually all injured nurses reported using gloves during the injury (Table 5). In various studies, it has been reported that a majority of nurses (80.2%) take precautions by wearing disposable/single-use gloves when caring for patients with blood-borne infections (Olgun et al., 2014). Similarly, Güney et al. (2017) found that among emergency service workers, gloves (59.0%) were the most commonly used protective measure in the past year. In many studies, the rates of the most frequently used personal protective equipment have been found to range between 55% and 93%, with gloves being the most common (Akkaya et al., 2014; Kaya et al., 2012; Kepenek et al., 2017). Additionally, it was determined that 12.6% of nurses did not take precautions for sharp object injuries due to carelessness, forgetfulness, or lack of concern (Okutan et al., 2018). In cases of injuries occurring through gloves, the risk of microorganism transmission is low, as gloves provide a good barrier, and the likelihood of infection following a sharp object injury through gloves is also reduced (Friedman et al., 2014). The high rate of glove usage among nurses is encouraging.

In the hospitals where this study was conducted, retrospective data on nurses' sharp object injury reports from the past year were requested, and it was determined that only 50 official reports were made in one year across all hospitals. However, nurses self-reported having experienced 324 injuries in the past year (Table 2). Based on this comparison, it is evident that the official reporting rates of sharp object injuries among nurses are quite low, with only about 1/6 of incidents being officially reported. In summary, nurses do not even report contaminated sharp object injuries, and even when they have sufficient knowledge, reasons such as lack of time and perceiving it as a waste of time are cited, indicating a tendency to avoid reporting, particularly for contaminated injuries. Furthermore, it is suggested that nurses do not regard these injuries as significant and avoid procedural requirements.

Limitations of the Study

In this study, an attempt was made to reach the entire population; however, conducting the study in different hospitals and the unwillingness of nurses to participate in the survey posed challenges. Additionally, the limitation of this study is that only the annual reporting numbers of injuries could be obtained from hospital records.

Conclusion and Recommendations

In this study, conducted to determine the causes and frequency of needlestick and sharp injuries among nurses, examine their post-injury information and practices, and retrospectively evaluate these notifications through hospital records, the following results were found;

- The frequency of needlestick and sharp injuries among nurses is high.

- The devices most frequently causing needlestick and sharp injuries among nurses are syringe needles and ampoules,
- Needlestick and sharp injuries among nurses are most often due to rapid movement and carelessness,
- Sharp object injuries among nurses predominantly occur during the 08:00-16:00 working hours,
- The rate of receiving training on needlestick and sharp injuries is high among nurses; however, incorrect practices such as squeezing and bleeding the injured area continue,
- The rate of using personal protective equipment during needlestick and sharp object injuries is high among nurses, with gloves being the most commonly used equipment,
- The reporting rates for needlestick and sharp injuries among nurses are low, with time constraints and lack of concern identified as the primary reasons for not reporting,
- It was concluded that the reporting rates for needlestick and sharp injuries among nurses in hospital records are very low.

The following recommendations are made in the study;

- In addition to general training on needlestick and sharp object injuries, new training strategies should be developed that are specific to each unit and aimed at transforming knowledge into behavior.
- Since a significant portion of injuries is caused by syringe needles and ampoules, institutions should procure safer medical supplies such as safety syringes and ampoule breakers and promote their use.
- The causes of injuries during the working hours when injuries are most frequently experienced should be investigated, and necessary precautions should be taken.
- Employee safety units, infection control units, and training nurses should work more actively to increase the rates of using protective equipment and reporting after injuries.
- Injury reports should not only be maintained for record-keeping; these records and studies should be reviewed to work on reducing injuries.
- Emphasis should be placed on sharp object injury topics in both undergraduate education and in-service training.
- Awareness of needlestick and sharp injuries among nurses should be increased, and reporting of such injuries should be encouraged.

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The Effect of Internalized Stigma on Psychological Resilience in People with Mental Illness

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ABSTRACT

Objective: The purpose of the present study was to evaluate the effect of internalized stigma on psychological resilience in people with mental illness.
Methods: The present study was a cross-sectional type. A hundred-sixty five (165) people with mental illlness were included in the study. Descriptive Features Form, Internalized Stigma of Mental Illness Inventory (ISMI), and Brief Resilience Scale (BRS) were utilized to gather data.
Results: There was a statistically negative strong relationship between ISMI and BRS (r=-0.803, *p*<.05). It was also identified that internalized stigma predicted psychological resilience by 64%.
Conclusion: Decreasing the level of internalized stigma of people with mental illness may positively affect their psychological resilience.
Keywords: Internalized stigma, mental illness, psychological resilience.

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Introduction

Today, mental illnesses have an important place among health problems. According to WHO data, mental illnesses are one of the most important causes of disability in the world, particularly in Türkiye (Abay & Çölgeçen, 2018). There are several mental illnesses that occur in diverse ways. These illnesses are frequently emerged by abnormal feelings, thoughts, behaviors, perceptions, and relationships with others. There are many issues with mental illnesses that make them hard to control. One of these issues is the stigmatization of people with mental illness by community. Stigmatization means to a loss of status and social exclusion, in which negative thought types about people with mental illness occur (Alptekin et al., 2014). The self-blame, shame, and fear of discrimination that people experience as a result of being stigmatized by community cause them to stigmatize themselves. Therefore, people with mental illness internalize the features attributed to them and come to accept the usual negative opinion of community (Yeşil & Han Almış, 2016). It has been stated that people with mental illness in community are subjected to stigma (Mejia-Lancheros et al., 2020). In addition, previous studies have indicated that people with mental illnesses have high levels of internalized stigma (Ayar et al., 2021; Pribadi et al., 2020). The stigmatization experience of people with mental illness causes them to feel ashamed of themselves, feel inadequate, avoid social relations, and socially isolate themselves (Sevinik & Arslan, 2020). All these negative situations cause people with mental illness to face many difficulties.

It can be asserted that each people has a diverse way for coping with the adversity caused by stigma. One of these way is psychological resilience. Psychological resilience is the capacity of an people to quite well come through and harmonize to adverse conditions. It has been determined that people with high levels of psychological resilience are more successful at struggling through the challenges of poverty, violence, illness, and many other stressful life events (Öz & Yılmaz Bahadır, 2009). The concept of resilience plays a leading role in the recovery process of people with serious mental illnesses and in understanding how they cope with their respective conditions (Mizuno et al., 2018). There are bound to be stressful and negative events in the lives of people with mental illness, and these negative life events also directly affect psychological resilience.

Increasing the psychological resilience of people with mental illness can also conduce positively to reducing the level of internalized stigma, as it can support the process of reintegrating people into society. In present study, it was assumed that the internalized stigma level of people with mental illness may affect negatively on their psychological resilience. In this respect, our study is important for psychiatric nursing.

Methods

Participants

As a result of the literature review, no study examining the relationship between "Internalized Stigma Scale" and "Psychological Resilience Scale" in people with mental illness was found, but the study closest to the current study, Post et al. (2021), data from the "Resilience predicts self-stigma and stigma resistance in stabilized patients with Bipolar I Disorder" study were used (Post et al., 2021). In this study, the relationship between the "Internalized Stigma Scale" and the "Resilience Scale" was found to be significant (r=-0.626). The sample size was calculated at 95% confidence level using the “G. Power-3.1.9.4” program. Since the study aimed to examine the relationship between internalized stigma and psychological resilience in people with mental illness, it was assumed that Pearson correlation analysis would be performed. The minimum sample size was determined as 15, with the effect size of the study being 0.79, the α value being 0.05, and the power being 0.95. However, the study was completed with a hundred-sixty-five (165) people with mental illness. People participating in the study were numbered according to their file records. Then, a simple random numbers table was created on the computer, and the participants were randomly selected. The included participants were people diagnosed with mental illness (Based on the Diagnostic and Statistical Manual of Mental Disorders, fifth edition, DSM-V, they were diagnosed with psychosis, and related disorders, anxiety disorders, mood disorders), 18 years of age and above, able to communicate, had completed the hospital treatment process (in remission), and had their drug use, drug side effects, and illness symptoms followed regularly by the psychiatrist.

Procedures

The present study was a cross-sectional type. The data were gathered by the first researcher by face-to-face interview in a Community Mental Health Center (CMHC) and psychiatry outpatient clinics between October 2022 and February 2023. The questions were read to the participants by the researcher and she marked their answers.

Measures

Descriptive Features Form: This form contains questions about marital status, age, gender, education status, presence of a history of mental illness in the family, employment status, diagnosis of the illness, and duration

of the illness (Ayar et al., 2021; Pribadi et al., 2020).

Internalized Stigma of Mental Illness Inventory (ISMI): It was improved by Rister et al. A Turkish reliability and validity study was performed by Ersoy & Varan (2007) (Cronbach's α 0.89) (0–25 score=low, 26–39 score=moderate, and 40 and above score=high levels of internalized stigma) (Ersoy & Varan, 2007). The scale is structured in a four-point Likert-type (1-4 point) and consists of 29 items, with subscales for stereotype endorsement, alienation, social withdrawal, perceived discrimination, and stigma resistance. The lowest-to-highest score range of the scale is 29–116. In the present study, the Cronbach's α was found as 0.93 for the scale.

Brief Resilience Scale (BRS): It was improved by Smith et al. A Turkish reliability and validity study was performed by Doğan (2015) (Cronbach's α 0.83). The BRS consists of six items measured on a five-point Likert-type scale. Each item is given a score between 1–5 (Not at all appropriate=1 points, Rarely appropriate=2 point, Sometimes appropriate=3 points, Appropriate=4 points, Always appropriate=5 points). Items 2, 4, and 6 of the scale are scored in reverse. The lowest-to-highest score range of the scale is 0-30. An increase in the total score got from the scale shows high psychological resilience. In the present study, the Cronbach's α was found as 0.92 for the scale.

Analysis

The data were examined in IBM SPSS 25.0 (IBM SPSS Corp., Armonk, NY, USA) program. A p-value < .05 was accepted significant for the present study. Cronbach's α coefficient was utilized in the internal consistency analysis of the scales. Percentage distribution was utilized to evaluate the descriptive features, and arithmetic mean was utilized to evaluate the total mean score of the scales. According to the results of the normality test (Shapiro–Wilk test), independent t-test, Kruskall Wallis were utilized to compare descriptive features and scales. Linear Regression and Pearson Correlation analysis were utilized to compare the ISMI and BRS. Tukey test was utilized for further analysis.

Ethical Consideration

Firstly, approval (Date: July 26, 2022, Number: 14/2022-3726) from the Ethics Committee of İnönü University and official permission from the hospital and CMHC were got. The purpose of the study was clarified to the people with mental illness, and they were notified that their data would be protected confidental and that they could leave the study at any time. Additionally, the study was carried out in the light of the Principles of Helsinki Declaration. The written consent was obtained from the people via informed voluntary onsent form.

Results

Comparison of the people' mean ISMI and BRS total scores according to descriptive features revealed statistically significant differences associated with age groups, educational status, presence of a history of mental illness in the family working status, diagnosis of the illness, and duration of the illness (p<.05). In the Tukey analysis, it was determined that the mean ISMI score was lowest and the mean BRS score was highest in the 18-28 age group, the education status in the university graduate group, the anxiety disorder group, and the in the 0-5 years group of duration of the illness. However, there were no statistically significant differences with respect to the people' marital status and gender in terms of the ISMI and BRS (p>0.05) (Table 1).

The total mean score of the people with mental illness were 76.20±9.73 on the ISMI, and 11.44±4.72 on the BRS (Table 2). Based on the total mean score of the scales, it can be said that the internalized stigma of these people were at a high level and psychological resilience of these people were at a low level.

There was a statistically negative strong relationship between total mean score of the BRS and the ISMI (r=-0.803, p<.05). In addition, it was identified that internalized stigma predicted psychological resilience by 64% (Table 3).

Discussion

The results obtained from the present study, which was carried out to state the effect of internalized stigma on psychological resilience in people with mental illness, are discussed in the context of the present literature.

It was stated that there was a statistically significant difference between the age groups for all the subscales and the total mean score of the ISMI. It was also found that the highest ISMI total mean score was in the 51-year-old and above group. Pribadi et al. (2020) reported a relationship between the level of internalized stigma and the age of people with schizophrenia. In another study of people with mental illness, Ayar et al. (2021) reported that people 51 years and above had higher levels of internalized stigma compared to other age groups. As the age of people with mental illness increases, stigma also increases due to the increase in the perception of loneliness of people, inadequacy in coping skills, a decrease in optimistic thoughts, a decrease in quality of life, and an increase in deterioration in functionality.

Table 1.
Comparison of Subscales of ISMI and ISMI Total Mean Scores and BRS Total Mean Scores of the People in Terms of Their Descriptive Features (N=165)

Descriptive Features				*Alienation*	*Stereotype Endorsement*	*Perceive Discrimination*	*Social Withdrawal*	*Stigma Resistance*	ISMI Total Score	BRS Total Score
		n	%	x̄ ±SD	x̄ ±SD	x̄ ±SD	x̄ ±SD	x̄ ±SD	x̄ ±SD	x̄ ±SD
*Age Groups	18-28	30	18.2	15.33±2.63	16.00±2.93	11.93±2.09	14.00±2.75	13.60±1.88	71.03±8.29	14.20±4.16
	29-39	67	40.6	16.44±2.65	17.00±2.87	12.73±2.61	14.80±2.96	12.97±2.02	74.08±9.13	12.74±4.76
	40-50	42	25.5	17.71±2.84	18.38±2.73	13.90±2.50	16.33±3.15	12.14±1.85	78.64±9.24	9.64±3.89
	51 and above	26	15.8	19.07±2.69	19.92±2.33	15.15±2.14	17.92±2.69	11.23±1.65	83.69±8.28	7.84±2.94
	Test Value			KW=25.795	KW=28.442	KW=24.331	KW=27.600	KW=23.797	KW=26.669	KW=36.880
	Significance			***p*=.000**	***p*=.000**	***p*=.000**	***p*=.000**	***p*=.000**	***p*=.000**	***p*=.000**
Gender	Male	93	56.4	16.97±2.78	17.76±2.88	13.33±2.44	15.59±3.03	12.48±1.97	76.38±9.15	11.11±4.29
	Female	72	43.6	16.98±3.14	17.45±3.21	13.18±2.86	15.47±3.40	12.75±2.12	75.97±10.48	11.87±5.21
	Test Value			*t*=-0.16	*t*=0.632	*t*=0.362	*t*=-0.234	*t*=-0.823	*t*= 0.266	*t*=-0.996
	Significance			*p*=.987	*p*=.528	*p*=.718	*p*=.815	*p*=.412	*p*=.790	*p*=.321
*Education Status	Illiterate	29	17.6	19.72±2.44	22.34±2.05	15.75±2.11	18.24±2.51	11.00±1.46	85.24±7.52	6.96±2.41
	Primary	62	37.6	18.20±2.41	19.12±2.18	14.43±2.09	16.87±2.65	11.46±1.72	80.38±7.79	9.33±3.72
	High	47	28.5	15.44±1.72	15.97±2.27	11.87±1.71	13.97±2.60	13.78±1.24	71.25±6.98	13.55±3.46
	University	27	16.4	13.88±1.69	14.14±1.32	10.33±0.83	12.29±1.10	14.85±0.66	65.51±3.43	17.44±1.45
	Test Value			KW=80.733	KW=81.249	KW=86.340	KW=74.490	KW=88.116	KW=77.896	KW=90.967
	Significance			***p*=.000**	***p*=.000**	***p*= .000**	***p*= .000**	***p*=.000**	***p*= .000**	***p*= .000**
Marital Status	Married	80	48.5	16.66±2.72	17.38±2.80	13.01±2.58	15.28±3.12	12.82±1.95	75.36±9.39	11.60±4.62
	Single	85	51.5	17.28±3.11	17.85±3.22	13.50±2.66	15.77±3.24	12.38±2.10	77.00±10.02	11.30±4.83
	Test Value			*t*=-1.363	*t*=-1.004	*t*=-1.207	*t*=-0.985	*t*=1.382	*t*=-1.083	*t*=0.399
	Significance			*p*= .175	*p*= .317	*p*=.229	*p*= .326	*p*=.169	*p*= .280	*p*= .690
Working Status	Employed	46	27.9	14.39±1.84	14.71±1.61	10.84±1.34	12.56±1.57	14.39±0.97	67.00±5.01	15.52±3.05
	Unemployed	119	72.1	17.98±2.66	18.75±2.67	14.20±2.39	16.68±2.90	11.90±1.91	79.76±8.73	9.87±4.29
	Test Value			*t=-9.833*	*t=-11.819*	*t=-11.309*	*t=-11.686*	*t=10.928*	*t=-11.719*	*t=9.443*
	Significance			***p*=.000**	***p*=.000**	***p*=.000**	***p*=.000**	***p*=.000**	***p*=.000**	***p*=.000**
Presence of a History of Mental Illness in the Family	Yes	61	37.0	19.00±2.82	19.62±2.60	15.06±2.38	17.63±2.70	11.16±1.62	82.75±8.82	8.57±3.73
	No	104	63.0	15.79±2.29	16.46±2.62	12.21±2.15	14.30±2.79	13.44±1.77	72.36±8.07	13.13±4.42
	Test Value			*t=7.517*	*t=7.497*	*t=7.679*	*t=7.549*	*t=-8.405*	*t=7.531*	*t=-7.059*
	Significance			***p*= .000**	***p*= .000**	***p*= .000**	***p*=.000**	***p*= .000**	***p*= .000**	***p*= .000**
*Diagnosis of the Illness	Psychosis	46	27.9	18.73±2.54	19.67±2.10	15.04±2.35	17.13±2.81	11.06±1.63	81.91±8.21	7.78±2.99
	Mood	67	40.6	17.56±2.61	18.31±2.74	13.70±2.24	16.23±3.04	12.29±1.74	78.35±8.86	10.61±4.18
	Anxiety	52	31.5	14.67±2.13	14.94±2.00	11.13±1.76	13.23±2.32	14.34±1.29	68.38±6.73	15.76±2.99
	Test Value			KW=53.860	KW=66.372	KW=61.443	KW=44.694	KW=67.730	KW=53.821	KW=73.172
	Significance			***p*=.000**	***p*= .000**	***p*=.000**	***p*= .000**	***p*=.000**	***p*=.000**	***p*= .000**
*Duration of the Illness (Years)	0-5	50	30.3	15.28±2.11	15.96±2.60	11.90±1.92	13.96±2.63	13.78±1.63	70.98±7.56	14.60±4.09
	6-10	49	29.7	16.46±2.80	16.85±2.93	12.65±2.61	14.75±2.99	12.87±2.09	73.77±9.28	12.26±4.46
	11-15	33	20.0	17.51±2.45	18.42±2.42	13.72±2.19	16.33±2.67	11.96±1.82	78.21±7.78	9.36±3.87
	16-20	33	20.0	19.78±2.49	20.51±1.80	15.78±2.10	18.30±2.74	11.03±1.42	85.72±7.64	7.54±2.61
	Test Value			KW=49.382	KW=51.830	KW=44.394	KW=40.679	KW=41.594	KW=48.356	KW=53.286
	Significance			***p*=.000**	***p*=.000**	***p*= .000**	***p*= .000**	***p*= .000**	***p*= .000**	***p*=.000**

ISMI: Internalized Stigma of Mental Illness Inventory , BRS: Brief Resilience Scale , *t*: Independent t-test, KW: Kruskall Wallis, *Tukey

Table 2.
Distribution of the People' ISMI Scale and Subscales and BRS Means

Scale	Min-Max	Mean±SD
Alienation	8-24	16.98±2.93
Stereotype Endorsement	10-25	17.63±3.02
Perceived Discrimination	7-20	13.26±2.62
Social Withdrawal	11-24	15.53±3.19
Stigma Resistance	9-16	12.60±2.03
ISMI Total	53-102	76.20±9.73
BRS Total	6-18	11.44±4.72

There was also a statistically significant difference between education status for all the subscales and the total mean score of the ISMI, and the highest ISMI total mean score was in the illiterate group. Previous studies have reported that the level of internalized stigma decreases as the education level of people with schizophrenia or mental illness increases (Coşkun & Güven, 2012; Kehyayan et al., 2021; Kök & Demir, 2018). The fact that these people experience more internalized stigma may be related to their difficulties in coping with problems and seeking help regarding their illness. In addition, with an increase in the level of education, people can obtain more information about the illness by doing more research on the cause, course, and treatment, which can reduce stigma

Table 3.
Correlation Between ISMI Subscales and Total Mean Scores and BRS Total Mean Score and Results of Regression Analysis

BRS	Regression***							Correlation**	
ISMI	R	R^2	β	*t*	*p*	df1,df2	F	r	*p*
Alienation	0.786	0.618	-0.489	16.231	**.000***	163,164	263.457	-0.786	**.000***
Stereotype Endorsement	0.842	0.709	-0.540	-19.946	**.000***	163,164	397.849	-0.842	**.000***
Perceived Discrimination	0.803	0.645	-0.447	-17.195	**.000***	163,164	295.683	-0.803	**.000***
Social Withdrawal	0.761	0.579	-0.514	-14.965	**.000***	163,164	223.948	-0.761	**.000***
Stigma Resistance	0.822	0.675	0.355	18.394	**.000***	163,164	338.331	0.822	**.000***
Total	0.803	0.645	-0.390	-17.221	**.000***	163,164	296.558	-0.803	**.000***

*$p<.05$ **Pearson correlation analysis ****Linear regression analysis

A statistically significant difference between working status for all the subscales and the total mean score of the ISMI was also found. The total mean score of the ISMI of unemployed people was higher than that of employed ones. Previous studies have reported that there is a relationship between the level of internalized stigma and the working status of people with schizophrenia, and that unemployed people have higher levels of internalized stigma (Pribadi et al., 2020; Ran et al., 2018). Former studies reported that the levels of internalized stigma of unemployed people with mental illness or mood disorders were higher than those of employed ones (Ayar et al., 2021; Gomes et al., 2021). Being financially inadequate can be a risk of highly internalized stigma. The perspective of society toward people with mental illness may also change positively as working people gain their economic independence and increase their level of financial self-sufficiency, thus leading to less exposure to stigmatization. For history of mental illness, there was a statistically significant difference on all the subscales and the total mean score of the ISMI. Specifically, people with a history of mental illness in the family had a higher total mean score on the ISMI than those who did not. However, in their study of people with schizophrenia, Alhadidi et al. (2021) did not determine a relationship between internalized stigma and a history of mental illness in family. In our culture, having a people with a mental illness in one's family is seen as a shameful situation, so such families are stigmatized by society and often isolate themselves, which may cause these people with such a history to experience more stigma. There was also a statistically significant difference between the diagnosis of the illness for all subscales and the total mean score of the ISMI. The total mean ISMI score of people diagnosed with psychosis and related disorders was higher than that of people with mood disorders and anxiety disorders. People with schizophrenia have been reported to be the group most exposed to stigmatization among those with mental illnesses (Schulze & Angermeyer, 2013). Yılmaz and Okanlı (2015) reported that people with schizophrenia had higher stigmatization levels compared to other mental illness groups. In another study, Pal et al. (2017) showed that people with schizophrenia experienced more stigma than people with bipolar and anxiety disorders. Elsewhere,

people with schizophrenia were found to experience more stigma and discrimination than people with other mental illnesses, such as depression and mania (Hasan & Musleh, 2017). The fact that psychotic disorders such as schizophrenia are a serious mental illness can cause people to be considered aggressive and dangerous by society and thus experience negative and rejecting attitudes from others, which may cause people with schizophrenia to experience more stigma. There was also a statistically significant difference between the duration of the illness for all subscales and the total mean score of the ISMI. The highest total mean score of the ISMI was in the 16-to-20-year-old group. One study found that people with panic disorder increased their stigmatization as the duration of the illness increased (Batinic et al., 2012). Pribadi et al. (2020) reported a significant relationship between the level of internalized stigma and the duration of the illness in people with schizophrenia. With the increase in the duration of the illness, the stereotypes of society may become more internalized, and people with mental illness may withdraw themselves from society; therefore, the level of internalized stigma will be higher. There was no statistically significant difference between gender and marital status for all the subscales and the total mean score of the ISMI. In line with this finding, Pribadi et al. (2020) stated that there was no significant relationship between the level of internalized stigma of people with schizophrenia and gender. Previous studies have found no significant relationship between internalized stigma and gender and marital status in people with schizophrenia, mental illness or mood disorders (Ayar et al., 2021; Gomes et al., 2021; Kehyayan et al., 2021; Zhang et al., 2019). These findings may be indicative of the fact that both women and men are equally affected by the attitudes and behaviors of society and are thus equally exposed to stigma.

Another statistically significant difference was determined between the age groups and the total mean score of the BRS. The highest BRS total mean score was in the 18–28 age group. Nunes et al. (2021) determined that there is a relationship between the resilience levels of people with severe mental illnesses (i.e., schizophrenia bipolar disorder, and major depression) and their age. In their study of people with euthymic bipolar I, Uygun et al. (2018) did not find a relationship between resilience and age. It can be argued that the symptoms and experiences of the illness increase the destructive effects on the lives of people with mental illness, and therefore negatively affect the goals and beliefs of the people about the future, which may cause a decrease in psychological resilience with increasing age. A statistically significant difference was also determined between education status and the total mean score of the BRS, and the highest BRS total mean score was in the university graduate group. Nunes et al. (2021) also stated that there is a relationship between the resilience levels of people with severe mental illnesses (e.g., major depression, bipolar disorder, and schizophrenia) and their education level. There was also a statistically significant difference between working status and total mean score of the BRS, with employed people receiving higher scores than unemployed people. The total scores of people with moderate economic status were found to be significantly higher than those of people with lower economic status (Şenormancı et al., 2022). It has been suggested that family income functions as a resilience factor in families where a people is diagnosed with schizophrenia (Bishop & Greeff, 2015). Having better economic resources may make it easier for patients to access social support in such cases. Another statistically significant difference was determined between presence of a history of mental illness in the family and the total mean score of the BRS, and people with no history of mental illness in the family had a higher BRS total mean score than people with such a history. In their study of people with euthymic bipolar I, Uygun et al. (2018) did not find a relationship between resilience and a family history of mental illness. There was also a statistically significant difference between the diagnosis of the illness and the total mean score of the BRS. Specifically, the total mean BRS score of people diagnosed with psychosis and related disorders was lower than that of people with mood disorders and anxiety disorders. In another study, Nunes et al. (2021) determined that people with major depression had lower levels of resilience than people with bipolar disorder and schizophrenia. It has been stated that low resilience levels pose a high risk for psychosis and schizophrenia in people and that high resilience is associated with less anxiety and depressive symptoms and better functionality (Sedic et al., 2021). This result may have been achieved because people with schizophrenia, who have a serious psychiatric disorder, adapt less to the difficulties they face in life. A statistically significant difference was also determined between the duration of the illness and the total mean BRS score. The highest total mean score of the BRS was in the 0–5 years group. While there are other studies showing that the duration of illness of people with schizophrenia is not related to resilience (Bozikas et al., 2016; Mizuno et al., 2016), psychological resilience may in fact decrease with an increase in the duration of the illness, since the treatment period for mental illnesses is long and difficult, and people may look more pessimistically toward the future. It should also be pointed out that there was no statistically significant difference between gender and marital status and the total mean scores of the BRS. Similarly, in their study of people with euthymic bipolar I, Uygun et al. (2018) could not find a relationship between resilience and gender and marital

status.

It was stated that there was a statistically negative strong relationship between the total mean score of the BRS and the perceived discrimination, alienation, stereotype endorsement, and social withdrawal subscales of the ISMI, as well as a statistically positive strong relationship between the stigma resistance subscale of the ISMI. In line with these results, it can be concluded that as people' psychological resilience levels increase, their internalized stigma levels decrease, but their stigma resistance increases. The results of this study therefore indicate that internalized stigma may be an important factor in the recovery processes of people with mental illness. Many interventions have focused on reducing the psychiatric symptoms of people with mental illnesses. As a side effect of mental illness, people may develop the risk of internalized stigma. In addition, this risk can be seen as a major obstacle to the recovery process and realization of life goals for people with mental illness. However, the psychological resilience of people with mental illnesses may protect them against the risk of internalized stigma. With the increase of internalized stigma, people' alienation from society, introversion, difficulty maintaining their people and social roles, and feelings of worthlessness and uselessness may decrease their psychological resilience levels. Increasing the level of resilience of people with mental illness may improve their ability to cope with the illness by resisting stigma and supporting their interpersonal relationships and social functionality.

Limitations of Study

The study was conducted in a hospital, CMHC and on people with mental illness with similar cultural and social features. Other limitation is that causality could not be sufficiently assessed because of the study's cross-sectional type.

Conclusion and Implications

There was a negative strong relationship between psychological resilience and internalized stigma, and a positive strong relationship with stigma resistance.

Today, internalized stigma creates serious problems among people with mental illness. Mental health and psychiatry nurses primarily need to determine the factors that increase psychological resilience and decrease internalized stigma in people with mental illness. Mental health and psychiatry nurses should apply many psychotherapeutic interventions and integrate these practices into routine clinical care, in addition to pursuing pharmacological treatment to reduce their internalized stigma and increase their level of psychological resilience. In addition to all these approaches, psychoeducation for people with mental illness, their caregivers, their families, healthcare workers, and society for understanding mental illnesses and training to combat stigma should be provided.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of 3726 İnönü University (Date: July 26, 2022, Number: 14/2022-3726).
Informed Consent: The written consent was obtained from the all people who took part in this study.
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Adaptation and Psychometric Evaluation of the Evidence-Based Practice Mentoring Scale into Turkish

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ABSTRACT

Objective: This study aimed to adapt the Evidence-Based Practice Mentorship Scale (EBP-Mentorship Scale) into Turkish and to evaluate its psychometric properties among Turkish nurses.
Methods: This methodological study was conducted with 152 nurses between October 2022 and May 2023. The EBP-Mentorship Scale was translated into Turkish, and its content and construct validity were assessed. Confirmatory factor analysis (CFA) was performed to validate the factor structure. Reliability was evaluated using Cronbach's alpha, Pearson's correlation, and intra-class correlation coefficients (ICC).
Results: The Turkish version of the EBP-Mentorship Scale retained the original 8 items and 1-factor structure. CFA results indicated a good model fit ($\chi 2/df < 2$, RMSEA < 0.08, CFI > 0.90, GFI > 0.90). The scale demonstrated high internal consistency (Cronbach's alpha = 0.94) and strong test-retest reliability (r = 0.956, $p < .01$; ICC = 0.997). The average variance extracted (AVE = 0.535) and composite reliability (CR = 0.899) values were sufficient, indicating good convergent validity.
Conclusion: The Turkish version of the EBP-Mentorship Scale is a reliable and valid tool for assessing EBP mentorship among Turkish nurses. Its use can enhance the implementation and evaluation of EBP mentoring programs in nursing practice.
Keywords: Evidence-based practice, mentorship, nursing, scale adaption, reliability, validity.

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Introduction

As life expectancy increases, health care costs and care burden increase. Appropriate use of resources and improving the quality of care is only possible with evidence-based practices. The use of evidence-based practice is known as the foundation of ensuring quality in healthcare. In order to develop an evidence-based health care approach, it is necessary to conduct research to be implemented in clinics and to create the necessary mechanisms to evaluate the research evidence and deliver the results to nurses (Çopur et al., 2015).

Evidence-based practice (EBP) is a problem-solving method healthcare professionals employ during clinical decision-making. It involves amalgamating research-derived evidence with the practitioner's expertise while also considering the patient's preferences and values (Çamveren & Vatan, 2019). In recent years, the EBP model has seen significant advancements and has been recommended for providing healthcare services in various professional fields, including nursing (Ephraim, 2021). EBP is a crucial link connecting top-tier research with its practical implementation in clinical settings. This connection results in improved patient outcomes, elevated care quality, and cost reductions within the healthcare system (Güngör & Özkütük, 2022; Hooge et al., 2022). However, due to known barriers like limited non-clinical time, perceived lack of institutional support, tradition-based cultures, and a shortage of EBP mentors, many healthcare professionals do not consistently engage in evidence-based practice (Jacobs, 2018; Khan et al., 2021). The presence of EBP mentors is instrumental in cultivating and upholding an environment that fosters EBP principles (Çamveren & Vatan, 2019). Mentoring is utilized in various fields, including health, management, and education.

Mentoring is a process "based on the principle of an experienced healthcare professional serving as a role model to a less experienced one, where counseling and guidance take place" (Çamveren & Vatan, 2019; Melnyk et al., 2012) Mentoring is a professional obligation for nurses and constitutes one of the foundational structures of clinical training and nursing practices (Melnyk et al., 2018). In a research investigation led by Melnyk et al. (2012), over 65% of nurses reported needing access to a mentor skilled in EBP to prioritize EBP in care and to confidently express their intentions and reasons to change any existing practice (Jacobs, 2018; Melnyk et al., 2022; Melnyk et al., 2021). Melnyk and colleagues (2021) have recently introduced a structural equation model. Their research offers support for the idea that mentorship and the promotion of an evidence-based practice culture have a direct impact on the competence and implementation of EBP, and they also have a positive influence on nurses' intention to stay within their respective healthcare institutions (Çamveren & Vatan, 2019). Nonetheless, numerous institutions face the challenge of having a limited number of EBP mentors. It is a common observation that these mentors often have minimal to no time outside of their clinical responsibilities for mentoring, consequently restricting the number of nurses who can benefit from mentorship (Jacobs, 2018). EBP mentors demonstrate extensive expertise thanks to their deep understanding of EBP and ability to enhance the EBP culture in healthcare systems (Çamveren & Vatan, 2019; Hooge et al., 2022). According to the Advancing Research and Clinical Practice Through Close Collaboration (ARCC©) Model, mentors typically acquire this knowledge and skillset through a 5-day training program. Furthermore, mentors acquire the knowledge and skills necessary to foster and align with the EBP culture (Ayhan Öncü, 2018; Çamveren & Vatan, 2019). Mentoring, when part of a multifaceted approach, is recognized as an important facilitator in the conduct of evidence-based science (Kim et al., 2017; Melnyk, 2012; Spiva et al., 2017; Wallen et al., 2010).

Mentoring supports nurses' readiness, belief in the EBP organizational culture, job satisfaction, and group cohesion (Spiva et al., 2017; Wallen et al., 2010). Because of these known benefits, it is critical to have a reliable tool to measure the effectiveness of EBP mentoring offered to nurses.

When Turkish literature is examined, it is seen that validity and reliability studies of various scales have been conducted regarding nurses' attitudes, knowledge levels and barriers to practice regarding evidence-based practice (Çay & Daşbaş, 2020; Yıldız, 2024; Yildiz & Güngörmüş, 2016). These scales are generally aimed at measuring perceptions and attitudes towards EBP at an individual level. However, there is no evaluation specific to mentoring in these studies. The EBP-Mentorship Scale is an original tool for directly evaluating evidence-based practice mentoring and comprehensively measures the quality, effectiveness and impact of the mentoring process on the nurse. In this respect, it differs from existing EBP scales in the Turkish literature and fills an important gap. In this context, the main purpose of this study is to evaluate the validity and reliability of the Turkish adaptation of the EBP-Mentorship Scale developed by Melnyk et al. (2022) and thus to make an original contribution to the literature.

Methods

Type of Study

This methodological research was undertaken by adapting the EBP-Mentorship Scale (EBP- Mentorship Scale) into Turkish to test its validity and reliability in nurses.

Study Population And Sample

The data of the study was collected online from nurses between October 2022 and May 2023. The population of the study consisted of nurses working in the hospital between these dates. The inclusion criteria were (1) having been working as a nurse for at least 2 years, (2) being older than 18 years of age, (3) having no psychiatric issues, and (4) possessing adequate communication skills. In the literature, it is stated that in scale development and adaptation studies, the sample size should be at least 10 to 20 times the number of items. A sample size determined in this range is considered sufficient to obtain valid and reliable results.(Andrew et al., 2019). There are 8 items in the original EBP-Mentorship scale. Hence, the anticipated sample size was between 80 and 160 participants. Consequently, the study included 152 nurses who met the inclusion criteria and consented to participate.

Data Collection Tools

The research data were collected through a descriptive information questionnaire and the EBP-Mentorship Scale. Psychometric assessments of the scale were collected between October 2022 and May 2023. Individuals were eligible for the research if they possessed a nursing designation and were employed within a healthcare system. Study of data collection tools were collected through an online questionnaire created through Google Forms. data collected online were obtained. The research data were collected through a descriptive information questionnaire and the EBP-Mentorship Scale. Online, 122 data sets were obtained. To assess temporal invariance, researchers collected an additional 30 data sets through face-to-face interviews. Subsequently, the analyses were conducted using 152 acquired data sets.

Personal Information Form

This form, which was prepared by the researchers, includes 6 questions that ask for nurses' socio-demographic information (e.g., age, gender, educational status, working unit, type of working, year of study).

EBP-Mentorship Scale

The EBP-Mentorship Scale, comprising eight items, was originally developed for the study conducted by Melnyk et al. in 2022. This scale was designed to assess the extent to which nurses have access to EBP mentors and mentorship support. It employs a 5-point Likert scale (Melnyk et al., 2022). By summing the responses to these items, a final score is calculated, which falls within the range of 8 to 40. A higher score on the scale indicates a greater presence of mentorship support.

Language Validity

The original EBP-Mentoring Scale was independently translated into Turkish by two linguists fluent in both English and Turkish, in accordance with internationally accepted scale adaptation guidelines (Seçer, 2020). The two translated versions were then compared and synthesized into a single draft by the research team. This preliminary Turkish version was subjected to expert assessment for content validity. Specifically, three Turkish linguists, including one expert in psychometrics and scale development, and five nursing academics with expertise in evidence-based practice examined each item for linguistic accuracy, conceptual equivalence, and cultural appropriateness. Based on their feedback, although the basic meaning of the items remained unchanged, minor wording adjustments were suggested to increase clarity and relevance. The revised Turkish version was then back-translated into English by a professional translator who was blind to the original scale. A comparison between the original English version and the back-translated version revealed a high degree of semantic and conceptual similarity, indicating strong linguistic and conceptual equivalence between the two versions. This comprehensive translation and expert validation process ensured that the Turkish version of the scale maintained the integrity and purpose of the original instrument. In addition, both the Turkish and back-translated versions of the final scale were sent to the author who developed the scale, and the pilot implementation phase was initiated after receiving the author's approval.

Content Validity

A content validity assessment was performed to verify both the linguistic and cultural equivalence of the Turkish version of the questionnaire, as well as the content validity of the items using numerical values. For an item to be considered valid in terms of content, the content validity index (CVI) must be greater than 0.80 (Chan & Idris, 2017; Yusoff, 2019). Experts evaluated each item in the scale prepared according to the Davis Technique as "the item is very suitable," "the item is suitable but minor changes are required," "the item needs to be brought into appropriate form" and "not suitable." In the Davis technique, the number of experts who marked the "item is very appropriate" and "item is appropriate but minor change is required" option is divided

by the total number of experts and the content validity index (CVI) for the item is obtained. In CVI, a value of .80 is accepted as a criterion (Davis, 1992). Based on the evaluations by the 10 experts, the CVI was calculated to be 0.84. This indicates that the content validity of the scale is statistically significant (Polit et al., 2007). As a result, no items were removed from the scale. The finalized version of the original scale was emailed to the author. Upon receiving the author's approval, the pilot implementation phase began.

Pilot Testing

In scale adaptation studies, the pilot phase should involve approximately 30 participants, aiming for a scale's internal consistency value greater than 0.70. It's also important to assess whether each item's correlation with the total score falls below 0.30 (Seçer, 2020). İn the current study, a pilot application was conducted with 30 nurses. The pilot application indicated that the questions were understandable. However, the data from the pilot application were not included in the study dataset. The main study commenced without making any revisions following the pilot application.

Study Application

The evaluation instrument was distributed to nurses by providing them with a data collection link using the Google Forms application, and it was administered only after securing their consent. A total of 122 nurses successfully submitted the data form. According to the existing literature, sample size is typically recommended to be 10-20 times the number of scale items (Andrew et al., 2019). In this study, data collection was accomplished with a sample size that exceeded the recommended 15.25 times the number of items in the 8-item EBP-Mentorship Scale. The stability of the scale was assessed using the test-retest method. İn the literature suggests conducting a retest within 15 to 30 days. In this study, the retest and ICC was performed after precisely 15 days.

Statistical Analysis

The statistical analysis for this study was performed using SPSS 22 (IBM SPSS Corp., Armonk, NY, USA) and AMOS software packages. The data obtained from the Personal Information Forms were analyzed using descriptive statistics, such as numbers and percentages.

To evaluate the content validity index and construct validity of the scale, factor analysis was conducted. Factor analysis is a technique used to determine if the items of a scale can be grouped under different factors, and it includes two types: exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). In this study, CFA was performed to validate the factor structure of the scale (Yaşlıoğlu, 2017). Bartlett's Test and Kaiser-Meyer-Olkin (KMO) analysis were performed to assess the adequacy of the sample size and the suitability of the dataset for analysis.

The acceptable range for CFA goodness-of-fit indices includes Chi-square/degree-of-freedom ($\chi 2/df$) < 2, root mean square error of approximation (RMSEA) < 0.08, goodness of fit index (GFI) > 0.90, normed fit index (NFI) > 0.80, comparative fit index (CFI) > 0.90, adjusted goodness of fit index (AGFI) > 0.85, and Tucker–Lewis index (TLI) > 0.90 (Bae, 2017).

To assess the reliability of the scale, Cronbach's alpha coefficient, Pearson's correlation analysis, and item-total score correlation analysis were conducted. Convergent validity was evaluated using the average variance extracted (AVE) and composite reliability (CR)(Alarcón et al., 2015). Convergent validity criteria for the model include an AVE value > 0.5 and a CR value > 0.7, indicating that the scale exhibits good reliability (Netemeyer et al., 2003). For convergent validity, the composite reliability (CR) should be greater than the average variance extracted (AVE), and the AVE should be greater than 0.5 (Yaşlıoğlu, 2017). Intra class corelations (ICC) and re-test analysis was conducted to assess time invariance.

Ethical Approval

Initially, the necessary permissions were secured from the scale authors, Melenky et al., via email. Ethics committee approval was received from the ethics committee of Erzurum Technical University (Date: December 29, 2022, Decision no: 11-/ 12). Nurse participants were informed about the voluntary nature of their participation and were asked for their consent via the Google Forms application. Moreover, they were assured that their identities and data would be kept confidential throughout the research. All steps of the research were carried out in accordance with the Declaration of Helsinki.

Results

Sociodemographic Characteristics

The majority of the nursing population was female, accounting for 78.9%. The age group most prominently represented was 26-30, comprising 41.4% of the sample. Additionally, those with an undergraduate degree comprised 58.6% of the study population, while nurses working in internal services accounted for 36.8%. Of the nurses, 67.8% work in shifts, with 41.4% being in their first three years of professional practice (Table 1).

Construct Validity

Prior to assessing the construct validity of the scale, Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity were conducted to evaluate the adequacy of sample size and dataset for factor analysis. The KMO measure of sampling adequacy was 0.945, indicating high suitability. Bartlett's Test of Sphericity yielded a significant result (x2 = 1080.506; $p < .001$) (Aksu et al., 2017; Seçer, 2020). Based on these findings, it is concluded that the dataset is appropriate for factor analysis.

Table 1.
Sociodemographic Characteristics of the Participants

Descriptive Characteristics	n	%
Gender		
Female	120	78.9
Male	32	21.1
Age		
Between 20 and 25 years	38	25.0
Between 26 and 30 years	63	41.4
Between 31 and 35 years	27	17.8
36 years and above	24	15.8
Education Status		
Health Vocational High School	7	4.6
Vocational school of health	12	7.9
Bachelor's degree	89	58.6
Master's degree and more than	44	28.9
Working unit		
Internal Clinics	56	36.8
Surgical Clinics	38	25
Management	50	32.9
Other	8	5.3
Type of working		
Usually during the day	49	32.2
Day-night rotation	103	67.8
Year of study		
0-3 years	63	41.4
4-6 years	30	19.7
7-10 years	22	14.5
11 years and more	37	24.3

Confirmatory Factor Analysis

CFA was conducted to validate the identified factors. Table 3 presents the fit index values obtained from the CFA. It was concluded that the fit indices obtained from the analyses were adequate (Bae, 2017). (Table 2). The PATH diagram obtained from the confirmatory factor analysis is shown in Figure 1. The provided figure shows that the unidimensional structure of the 'EBP-Mentorship Scale' has been ascertained by incorporating two modification indices (Figure 1).

Table 2.
Goodness-of-Fit Indices and Corresponding Acceptable Values for the Confirmatory Factor Analysis of the EBP-Mentorship Scale

Discriminant Function Analysis (DFA) Fit Tests	Observed Value in the Scale Model	Acceptable Fit Criterion	Excellent Fit Criterion	Result
Ki-Kare/sd	2.477	<5	<3	Perfect compatibility
RMSEA	0.078	0.06≤RMSEA< 0.08	0<RMSEA<0.05	Allowable compatibility
S-RMR	0,028	0.06≤S-RMR≤0.08	0≤S-RMR≤0.05	Perfect compatibility
NFI	0.969	0.95≤NFI≤ 0.96	0.96≤NFI≤1	Perfect compatibility
CFI	0.985	0.90<CFI< 0.96	0.96≤ CFI≤1	Perfect compatibility
GFI	0.947	0.90<GFI< 0.95	0.95≤ GFI≤1	Allowable compatibility
IFI	0.985	0.90<IFI< 0.95	0.95≤ IFI≤1	Perfect compatibility

To evaluate the convergent validity of the factors, AVE values were calculated. Additionally, CR values were computed. The composite reliability values for the factors exceeded the AVE values, and the AVE values surpassed the critical threshold of 0.50 (Table 3).

Reliability Results

In the conducted analysis, Cronbach's Alpha coefficient was calculated to assess the internal consistency of the scale or instrument. The scale had a Cronbach's alpha of 0.94 (Table 3).

In order to emphasize and assess the scale's temporal stability, the Turkish version was administered to a sample of 30 individuals, with evaluations conducted 15 days apart (Kline, 2014). Examining the between pre-test and post-test scores using Pearson's correlation method yielded a notably strong and statistically significant relationship ($r = 0.956$, $p<.01$, $n = 30$). In addition, it was determined that the intra-class correlation coefficients, which include the correlation between measurements as well as the agreement between absolute results, were above 0.95.

Discussion

There is currently no scale specifically designed to evaluate nurses' evidence-based mentoring practices. Therefore, the EBP-Mentorship Scale was translated into Turkish, and its psychometric properties were investigated.

Table 3.
Mean Scores and Reliability Coefficients of the EBP-Mentorship Scale

Scale	Alpha	AVE	CR	X ±sd
EBP-Mentorship Scale	0.944	0.535	0.899	8-40

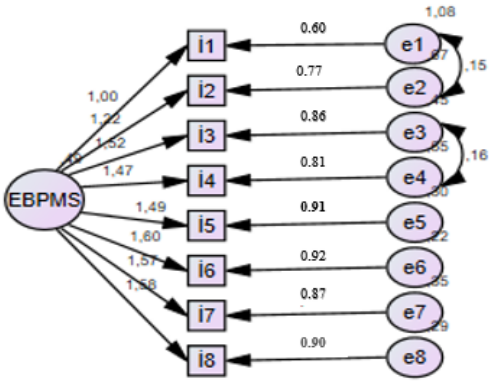

Figure 1. Path Diagram of the EBP-Mentorship Scale

Scale adaptation is a complex process involving a thorough examination of how to maintain the content and psychometric properties of the scale, ensuring its overall validity for the target population. This process encompasses various stages (Borsa et al., 2012). The initial stage involves translation. In this study, the original scale was translated into Turkish by language experts and subsequently reviewed by field experts. To assess the content validity of the scale, the Content Validity Index (CVI) was calculated. A CVI value above 0.80 is generally considered acceptable, indicating adequate content validity (Polit & Beck, 2006). In this study, the CVI was found to be 0.84, demonstrating that the scale achieved sufficient linguistic and content equivalence. This high value also reflects substantial agreement among the experts regarding the relevance and clarity of the items (Beckstead, 2009).

After ensuring content validity, factor analysis was performed. Factor analysis is one of the most used approaches to assess construct validity. The two primary purposes of factor analysis are to reduce the number of variables (factor reduction) and to classify the variables (DeVellis & Thorpe, 2021). However, it is stated that confirmatory factor analysis should be performed directly instead of exploratory factor analysis during the process of adapting a measurement tool (Seçer, 2020). Because confirmatory factor analysis allows testing an existing or constructed model. In this study, the same structure was found in the validation study of the original version of the scale. As a result of the analysis, CFA fit index values X2/df, RMSEA, CFI, NFI, GFI, AGFI, and TLI. X2/df < 2 and RMSEA < 0.80 (p > .05); GFI, AGFI, NFI, and CFI > 0.90 showed good fit (Kline, 2014; Seçer, 2020; Tabachnick BG, 2019; Yaşlıoğlu, 2017). Hence, all the goodness-of-fit indices of the scale were found to be within acceptable limits. For the original scale developed by Melenky et al. (Melnyk et al., 2022), the RMSEA value was 0.054. Overall, the findings of the current study indicated that the 8-item, one-factor model exhibited acceptable model fit. Therefore, no modifications to the original scale were deemed necessary, and some values even demonstrated a perfect fit (Kline, 2014; Seçer, 2020). All these findings indicate that the scale has high validity in Turkish culture. These findings also provide important evidence that the conceptual framework of the original scale is preserved in the Turkish context. This suggests that the underlying construct is understood and interpreted similarly across cultures. The fact that no modifications were required supports the cross-cultural stability of the scale, reinforcing its practical applicability in both research and clinical settings in Türkiye. The scale can therefore be used with confidence to assess the relevant construct in Turkish nursing practice, contribute to standardized assessments, facilitate international comparisons, and support evidence-based decision making in local healthcare settings. All these findings suggest that the scale has high validity in Turkish culture.

Convergent validity is one of the methods used to assess the validity of the scale. Convergent validity is assessed using average variance extracted (AVE) and composite reliability (CR) (Alarcón et al., 2015). An average variance extracted (AVE) greater than 0.50 and a composite reliability (CR) greater than 0.70 indicate that the scale has good reliability (Netemeyer et al., 2003). Additionally, to establish convergent validity, it is necessary that CR > AVE and AVE > 0.5 (Yaşlıoğlu, 2017). In the current study, the AVE was found to be 0.535 and CR was 0.899 for the scale, indicating that AVE values exceeded CR values. These results from the current study also demonstrated that the scale had high validity. These findings suggest that the items in the scale are strongly related to the underlying construct and that the scale provides consistent and meaningful measurements. This reinforces the scale's potential usefulness in accurately capturing the targeted concept in Turkish nursing practice.

Scale reliability refers to the consistency of responses to the test items and how accurately the scale measures the intended construct. Cronbach's alpha is widely used as a measure of internal consistency reliability (Bolarinwa, 2015). According to the literature, the reliability ranges for Cronbach's alpha are as follows: $0.80 < \alpha < 1.00$ indicates high reliability, $0.60 < \alpha < 0.80$ indicates quite reliable, $0.40 < \alpha < 0.60$ indicates low reliability, and $0.00 < \alpha < 0.40$ is considered not reliable (Şimşek, 2020). In this study, both the factor and total Cronbach's alpha coefficients of the scale were greater than 0.80. Melenky et al. reported a total Cronbach's alpha coefficient of 0.99 for the original scale (Melnyk et al., 2022). These results show that the scale items consistently reflect the construct being measured, supporting its dependable use in different settings and ensuring trustworthy assessments in Turkish nursing practice.

For the final reliability analysis of the EBP-Mentorship Scale, the test-retest method was applied. The EBP-Mentorship Scale was administered to 30 nurses, and then re-administered approximately 15 days later (Kline, 2014). The analysis revealed a very strong positive linear relationship between the pre-test and post-test scores ($r = 0.956$, $p < .01$, $n = 30$). Additionally, the intra-class correlation coefficient (ICC) was found to be within the reliable range (ICC = 0.997) (Shrout & Fleiss, 1979). These results indicate that the scale shows a high degree of consistency and stability over time. This temporal reliability strengthens confidence in the scale's use for repeated assessments and supports its practical applicability in longitudinal research and routine evaluations in clinical settings.

Limitations

This study was conducted online, which introduces certain methodological limitations. One major limitation is the exclusion of individuals without internet access or those who lack digital literacy, potentially leading to sampling bias. As a result, the findings may not be representative of the broader nursing population, particularly those working in regions with limited technological infrastructure. Furthermore, the voluntary nature of online survey participation may result in the overrepresentation of specific demographic groups—such as younger nurses or those more comfortable with technology—which could skew the results. These factors limit the generalizability of the study's findings across different geographic areas, healthcare settings, and levels of clinical experience.

Conclusion and Recommendations

Based on the analysis results, it was determined that the Turkish version of the scale consists of 8 items and one factor, mirroring the structure of the original scale. Confirmatory factor analysis indicated a good model fit, and the Cronbach's alpha coefficient demonstrated high internal consistency, comparable to the original version. Additionally, adequate average variance extracted (AVE) and composite reliability (CR) values were observed. These findings support the cultural and psychometric equivalence of the Turkish version of the scale.

The EBP-Mentorship Scale provides a reliable and valid tool for assessing evidence-based practice mentorship among Turkish nurses. Its use in both clinical and academic settings is strongly recommended to evaluate and enhance mentorship quality. Nurse managers and educators can utilize this scale to identify strengths and areas for improvement in mentorship programs, support the development of evidence-based nursing culture, and guide policy and training efforts. Furthermore, incorporating the scale into mentorship evaluation processes may contribute to improving job satisfaction, professional development, and overall care quality in healthcare institutions.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Erzurum Technical University (Date: December 29, 2022, Decision no: 11-/ 12).
Informed Consent: Verbal consent was obtained from the nurses participating in the study.
Peer-review: Externally peer-reviewed.
Author Contributions: Consept – Y.E. ; Design – Y.E., F.U.; Data Collection and/or Processing – Y.E., F.U, E.U; Analysis and/or Interpretation – Y.E., F.U.; Literature Review – Y.E., F.U.; Written by – Y.E., F.U, E.U; Critical Review – Y.E., F.U.
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Effects of Postpartum Stressors on Parenting Behaviors

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ABSTRACT

Objective: This study was conducted to determine the effects of postpartum stressors on parenting behaviors.

Methods: The population of this descriptive-relational study consisted of 520 postpartum women who gave birth in a hospital in southern Türkiye. The data were collected face-to-face between January and December 2022. The data of the study were collected face to face between January and December 2022 using the "Personal Information Form", "Postpartum Stress Scale" and "Postpartum Parental Behavior Scale".

Results: Number of children, employment status, dependency status, spouse's age, spouse's occupation, place of residence, social security status, pregnancy planning status, and education on pregnancy and childbirth were determined as significant predictors of postpartum stress; any problems during childbirth were determined as significant predictors of postpartum parenting behaviors (p<.05).

Conclusion: It was concluded that as the postpartum stress levels of postpartum women decreased, their parenting behaviors became more positive. For women to develop positive parenting behaviors in the postpartum period, it is important to provide holistic education, counseling, and care services by keeping the factors that affect parenting behaviors in mind.

Keywords: Parenting behaviors, nursing, postpartum period, stress.

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Introduction

The transition to motherhood roles is a process in which the identity of the woman as a mother is shaped, the woman adopts motherhood roles, and she learns motherhood behaviors (Koç et al., 2016). The acquisition of parenting behaviors refers to the combination of developmental behaviors and attitudes with social roles that start in pregnancy, continue in the postpartum period, and are completed by the development of an identity as a mother (Rincón-Cortés & Grace, 2020). While the process of becoming parents, the decision of the couple to get pregnant, and having a baby is an event that is a source of happiness for a woman, it is a challenging situation because it is a process of change that requires new roles and responsibilities (Koç et al., 2016). The immediate emergence of motherhood behaviors at the moment of delivery originates from the hormonal changes that are observed during pregnancy and childbirth (Koç et al., 2016; Rincón-Cortés & Grace, 2020). The maintenance of motherhood behaviors on the days following childbirth is strongly affected by learning, as well as the tactile and olfactory stimuli originating from the newborn (Rincón-Cortés & Grace, 2020). In addition to this, the postpartum period is a period in which the woman tries to cope with the physiological and psychological changes occurring in her body, baby care, breastfeeding self-efficacy, breastfeeding-related problems, and issues experienced in this period such as pain, bleeding, and infections (Aydın et al., 2022). Previous studies have reported some significant sources of stress for mothers in the postpartum period as the health and care of the baby, the breastfeeding process, the struggle to manage the physical and psychological changes in their bodies, sleep disorders, and the balancing of their responsibilities in their work and personal lives (Razurel et al., 2017). Moreover, in some women, low perceived social support in the postpartum stage was associated with high perceived stress levels (Leonard et al., 2020). These high levels of stress perceived in the postpartum period may affect the quality of life and parenting behaviors of individuals negatively by raising the prevalence of depressive symptoms (Norhayati et al., 2015; Razurel et al., 2017). For expecting parents, childbirth and the transition to parenthood may represent stressful life events that are characterized by various changes and challenges in their lives that affect new responsibilities regarding a small baby, as well as the entire system of the family (Paschetta et al., 2014). The postpartum period was defined as a period of increased susceptibility to the development or exacerbation of mental health problems in individuals who are becoming new parents (Singley & Edwards, 2015). In this context, several studies have demonstrated that poor mental health in the postpartum period is associated with various negative outcomes for both parents and their children. In previous studies, the postpartum stress and depressive symptoms experienced by the new mother have been frequently associated with lower quality of life (Blum et al., 2022), difficulties in transition to parenthood (Garthus-Niegel et al., 2018), increased suicidal ideation (Pope et al., 2013), and negative outcomes in the relationship between the mother and her child (Lutkiewicz et al., 2020). While there are measurement instruments that assess the prenatal and postpartum needs of women in Türkiye, no study examining the stressors of women specific to the postpartum period and their effects on parenthood could be found. Hence, this study was conducted to determine the effects of postpartum stressors on parenting behaviors.

Methods

Study Design

This study was conducted with a descriptive and correlational design to determine the effects of postpartum stressors on parenting behaviors.

Population and Sample of the Study

The study was carried out with postpartum women who were admitted to the maternity wards and obstetrics inpatient clinics of Osmaniye State Hospital between January and December 2022.

The population of the study consisted of postpartum women who were admitted to the maternity wards and obstetrics inpatient clinics of Osmaniye State Hospital. The sample included women who were selected from the population using the non-probability random sampling method, voluntarily agreed to participate in the study and did not have any risk in terms of maternal or neonatal health. The sample size needed to conduct the study was calculated using the G*Power V3.1.9.4 software (Faul et al., 2007). By taking the mean Postpartum Stressors Scale score reported in a similar study in the literature (18.33±5.92) as a reference (Şenol & Pekyiğit, 2021), based on a power of 0.95, an error margin of 0.05, and an effect size of 0.28, it was determined that at least 140 participants needed to be included in the sample. In order to increase the statistical significance and generalizability of the results of the study, to allow subgroup analyses and to take precautions against possible missing data, the sample size was increased and the study was completed with 520 postpartum women (Polit and Beck, 2017). The sample included mothers who were in the postpartum period, did not have any obstetric risk, had healthy and singleton babies, agreed to participate in the

study, and displayed adequate communication skills.

Data Collection Forms and Instruments

The data were collected using a "Personal Information Form" prepared by the researchers in line with the relevant literature (Britton et al., 2001; Çalışır et al., 2009), the "Postpartum Stressors Scale (PPSS)", and the "Postpartum Parenting Behavior Scale (PPBS)".

Personal Information Form

This form consisted of a total of 19 questions designed to collect information about the descriptive characteristics of the mothers and their babies such as age, education status, working status, number of pregnancies, mode of delivery, status of having received prenatal care, and sex of the baby.

Postpartum Stressors Scale (PPSS)

PPSS is used to identify stressors in women in the postpartum period. It was developed by Park et al. (2015) and adapted to Turkish society by Şahbaz (2024), who also conducted its validity and reliability study in Turkish. The scale, consisting of 9 items, is a 4-point Likert type and does not contain reverse items. Higher scores are interpreted as higher levels of stress experienced by the woman in the postpartum period. The Cronbach's alpha internal consistency coefficient of PPSS was reported as 0.76 (Şahbaz, 2024). In this study, this coefficient was found to be 0.85.

Postpartum Parenting Behavior Scale (PPBS)

PPBS is used to evaluate the parenting behaviors of parents shown to the newborn after childbirth during their first encounter. The scale was developed by et al. (Britton et al., 2001) and adapted to Turkish society by Çalışır et al. (2009). Higher scores are considered to indicate more positive parenting behaviors shown toward the baby. The Cronbach's alpha internal consistency coefficients of the scale were reported in the range of 0.85-0.93 (Çalışır et al., 2009). In this study, this coefficient was found to be 0.627.

Data Collection

The data were collected during the first encounter between the new mother and her baby in the postpartum room of the maternity ward and obstetrics clinic. The data collection instruments were administered face-to-face by the researchers after informing women who met the inclusion criteria of the study about the objective of the study and receiving their informed consent. It took approximately 20 minutes to collect data from each participant.

Data Analysis

The statistical analyses of the collected data were carried out using the SPSS 22 (IBM) program. Descriptive statistics are presented as frequency, percentage, mean, and standard deviation values, and the analyses included the Mann-Whitney U test, the Kruskal-Wallis test, ANOVA, Pearson's correlation analysis, and multiple linear regression analysis. The normality of the data distribution was assessed using the Kolmogorov-Smirnov test, skewness and kurtosis values, and histogram plots. Skewness and kurtosis values between -1.5 and +1.5 were considered indicators of acceptable normality. Based on these indicators, parametric or nonparametric tests were selected accordingly. The results were interpreted in a 95% confidence interval and at a significance level of $p<.05$.

Ethical Principles

Ethics committee approval was obtained from the Scientific Research and Publications Ethics Committee in Natural Sciences at Osmaniye Korkut Ata University (Date: 25.01.2022, Number: 2022/1/14), and institutional permission was granted by the hospital where the study would be conducted. After being informed about the purpose of the study, women who agreed to participate in the study provided written consent. Data were collected in compliance with the ethical standards set forth by the Declaration of Helsinki. The participants were informed that they had the right to withdraw from the study at any time before, during, or after the interviews. The participants approved the recording of the interviews and the publication of the results of the study in a scientific journal provided that their identifying information would be kept confidential.

Results

The mean age of the participants, who consisted of 520 postpartum women, was 26.72±5.27. It was determined that 37.3% of the participants were high school graduates, 37.9% had three or more children, 87.3% were not working, 89.8% did not have any addictions, and the partners of 45.8% were 27-33 years old. It was found that the partners of 41.3% of the participants were high school graduates, the partners of 98.7% were working, the income and expenses of 78.7% were equivalent, 53.5% were living in cities, and 64.2% had social security (Table 1).

The education levels of the participants, their family types, and the sexes of their babies were found to not significantly affect their mean total PPSS and PPBS scores ($p>.05$). The parameters of number of children, occupation, addiction status, age of the partner, occupation of the partner, place

of residence, social security status, pregnancy planning status, and status of having received education about pregnancy and childbirth were significantly effective on the mean total PPSS scores of the participants (p<.05). The parameters of education level of the partner, family income level, pregnancy planning status, mode of delivery, gestational week of the baby at birth, status of having a baby of the desired sex, and status of experiencing any problem during childbirth affected the mean total PPBS scores of the participants significantly (p<.05).

As significant differences were found in the PPSS scores of the participants based on the number of children they had, the ages of their partners, their places of residence, and their pregnancy planning statuses (p<.05), the mean scores of the groups were subjected to pairwise comparisons using the Mann-Whitney U test with Bonferroni correction to identify the sources of these differences. Because 3 pairwise comparisons were made in total, the alpha value as a result of the Bonferroni correction was taken as 0.05/3=0.017. Accordingly, as seen in Table 1, the PPSS scores of the participants who had 1 child were significantly higher than the scores of those who had 2 children and those who had 3 or more children (p=.000<.017). The PPSS scores of the participants whose partners were 18-26 years old and those whose partners were 27-33 years old were significantly higher than the PPSS scores of those whose partners were 34-50 years old (p=.000<.017). The PPSS scores of the participants who were living in districts were significantly higher than the PPSS scores of those who were living in cities (p=.016<.017).

As significant differences were found in the PPBS scores of the participants based on the education levels of their partners, their family income levels, their pregnancy planning status, and their modes of delivery, pairwise comparisons of the mean scores of the groups were made using Tukey's test. According to the results of the test, the participants whose partners were middle school graduates had a significantly higher mean PPBS score than those whose partners were primary school graduates, and the participants who had equivalent income and expense levels had a significantly higher mean PPBS score than those whose income levels were lower than their expense levels (p<.05). The participants who stated, "my pregnancy was unplanned, I did not feel ready for this pregnancy" had a higher mean PPBS score than the participants who stated, "it was a planned pregnancy" and those who stated, "it was unplanned, but I was happy", and the participants who gave birth by cesarean section had a significantly higher PPBS score than those who gave birth through the vaginal route (p<.05). Significantly higher mean PPBS scores were found in the participants whose babies were born at or later than the 38th gestational week, those who stated that they had babies of the sexes they had wanted, and those who did not experience any problems during childbirth (p<.05).

Table 1.
Comparisons of the Mean PPSS and PPBS Scores of the Participants Based on Their Descriptive Characteristics (n: 520)

Characteristics	n (%)	PPSS	PPBS
		X±SD (Min-Max)	X±SD (Min-Max)
Education level			
Primary school	115 (22.1)	20.10±5.68	4.84±1.40
Middle school	169 (32.5)	18.88±5.84	5.16±1.26
High school	194 (37.3)	20.45±5.87	5.04±1.26
University	42 (8.1)	19.45±6.11	5.24±0.96
KW; *p*		5.471; .065	4.166; .125
Number of children			
1	150 (28.8)	21.34±5.26[1]	4.93±1.25
2	173 (33.3)	19.83±5.96[2]	5.10±1.25
3 or more	197 (37.9)	18.55±5.94[3]	5.09±1.31
KW; *p*		**20.439; .000** 1>3, 1>2**	3.158; .206
Occupation			
Not working	454 (87.3)	19.41±5.69	5.04±1.29
Working	66 (12.7)	22.32±.6.38	5.14±1.12
t; *p*		**-3.815; .000****	-0.590;.556
Addiction			
None	467 (89.8)	19.55±5.71	5.05±1.25
Smoking	53 (10.2)	21.77±6.77	5.02±1.50
t; *p*		**-2.294; .025***	0.188; .851
Age of partner			
18-26	122 (23.5)	20.45±5.61[1]	5.02±1.40
27-33	238 (45.8)	20.42±5.92[2]	4.98±1.24
34-50	160 (30.8)	18.31±5.72[3]	5.18±1.21
KW; *p*		**15.441; .000** 1>3, 2>3**	3.236; .198
Education level of partner			

Primary school	81 (15.6)	19.74±5.32	4.79±1.53[1]
Middle school	163 (31.3)	18.99±6.16	5.25±1.22[2]
High school	215 (41.3)	20.42±5.64	4.96±1.25[3]
University	61 (11.7)	19.69±6.33	5.18±1.00[4]
F; *p*		1.845; .138	**2.990; .031* 2>1**
Occupation of partner			
Not working	7 (1.3)	12.86±2.85	5.43±0.98
Working	513 (98.7)	19.88±5.83	5.04±1.28
t; *p*		**-3.176; .002***	0.792; .429
Family type			
Nuclear	429 (82.5)	19.86±5.82	5.02±1.26
Extended	91 (17.5)	19.41±6.05	5.18±1.33
U; *p*		-0.727; .467	-1.474;.141
Family income level			
Income > expenses	27 (5.2)	20.07±5.45	4.78±0.97[1]
Income ~ expenses	409 (78.7)	19.85±5.87	5.13±1.25[2]
Income < expenses	84 (16.2)	19.33±5.96	4.76±1.43[3]
F; *p*		0.309; .734	**3.556; .029* 2>3**
Place of residence			
City	278 (53.5)	19.29±5.99[1]	5.08±1.31
District	203 (39.0)	20.57±5.55[2]	5.01±1.21
Village	39 (7.5)	19.18±6.11[3]	5.03±1.31
KW; *p*		**6.190; .045* 2>1**	1.462; .482
Has social security			
Yes	334 (64.2)	20.18±5.78	5.04±1.15
No	186 (35.8)	19.05±5.92	5.07±1.47
t; *p*		**2.103; .036***	-0.266; .791
Pregnancy planning status			
Planned pregnancy	355 (68.3)	19.99±5.76[1]	5.08±1.22[1]
Unplanned, but I was happy	159 (30.6)	19.11±6.03[2]	5.04±1.37[2]
Unplanned, and I did not feel ready for this pregnancy	6 (1.2)	24.67±3.72[3]	3.67±0.82[3]
F; *p*		**3.392; .034* 3>1, 3>2**	**3.680; .026* 3<1, 3<2**
Has received education about pregnancy and childbirth			
Yes	272 (52.3)	20.57±5.73	5.03±1.19
No	248 (47.7)	18.92±5.88	5.07±1.36
U; *p*		**-3.471; .001***	-1.163; .245
Mode of delivery			
Vaginal delivery	304 (58.5)	19.58±5.69	4.95±1.24[1]
Planned cesarean delivery	181 (34.8)	20.30±5.90	5.25±1.24[2]
Emergency cesarean delivery	35 (6.7)	18.86±7.09	4.83±1.60[3]
F; *p*		1.324; .267	**3.763; .024* 2>1**
Sex of baby			
F	262 (50.4)	19.47±5.70	5.05±1.27
M	258 (49.6)	20.09±6.01	5.05±1.28
t; *p*		-1.207; .228	-0.007; .995
Gestational week of baby at birth			
37 weeks or earlier	52 (10.0)	18.81±5.96	4.62±1.89
38 weeks or later	468 (90.0)	19.89±5.84	5.10±1.18
t; *p*		-1.263; .207	**-2.610; .009***
Had a baby of desired sex			
Yes	356 (68.5)	20.09±5.65	5.23±0.99
No	164 (31.5)	19.12±6.25	4.64±1.66
t; *p*		-1.393; .164	**4.282; .000****
Experienced a problem during childbirth			
Yes	19 (3.7)	20.79±5.91	4.26±1.66
No	501 (96.3)	19.74±5.86	5.08±1.25
t; *p*		0.764; .445	**-2.763; .006***
Source of support in the postpartum period *			
Partner	217 (41.7)	19.02±5.17	20.32±4.96
Mother	206 (39.6)	19.76±5.04	19.78±5.05
Mother-in-law	120 (23.1)	19.96±4.92	19.72±5.08
Sister	82 (15.8)	18.36±4.87	20.04±5.08
No one	6 (1.2)	23.33±4.33	19.73±5.05

X±SD: Mean±Standard Deviation, Min-Max: Minimum-Maximum, **p<.05, **p<.01, U: Mann-Whitney U test, t: Student's t-test, KW: Kruskal Wallis, *Multiple choices were allowed. F: One-Way Analysis of Variance (ANOVA)*

The total score range of PPSS is 9-35, and the mean PPSS score of the participants was 19.78±5.86. The total score range of PPBS is 0-6, and the mean score of the participants was 5.05±1.27. Cronbach's alpha coefficients were 0.73 for PPSS and 0.63 for PPBS (Table 2).

Table 2.
Mean PPSS and PPBS Scores of the Participants (n: 520)

Scales	X±SD	Min-Max	Cronbach's alpha
Postpartum Stressors Scale (PPSS)	19.78±5.86	9-35	0.728
Postpartum Parenting Behavior Scale (PPBS)	5.05±1.27	0-6	0.627

Table 3.
Relationship Between the PPSS and PPBS Scores of the Participants (n: 520)

	Postpartum Parenting Behavior Scale	
Postpartum Stressors Scale	r; *p*	-0.226; **.000****

There was a negative and significant relationship between the PPSS and PPBS scores of the participants (r=-0.226, *p*<.01) (Table 3).

In the multiple linear regression model established using the variables associated with the parenting behaviors of the participants, including the gestational week of the baby at birth, status of having a baby of the desired sex, status of experiencing any problems during childbirth, and PPSS, $AdjR^2$ was found to be 0.113. This result indicated that all factors in the model collectively explained 11.3% of the total variance in the total PPBS scores of the participants (R^2: 0.120, $AdjR^2$: 0.113, *p*: .000) (Table 4).

Table 4.
Relationships between some variables and the PPBS scores of the participants (n: 520)

PPBS risk factors	PPBS total				
	B	SE	β	t	*p*
Gestational week of baby at birth	0.442	0.177	0.104	2.498	**.013**
Baby having the desired sex	-0.570	0.114	-0.208	-5.019	**.000**
Experiencing any problem during childbirth	0.596	0.282	0.088	2.110	**.035**
PPSS	-0.050	0.009	-0.231	-5.564	**.000**
R: 0.347, R^2: 0.120, $AdjR^2$: 0.113, *p*: .000					

**Multiple Linear Regression Analysis*

Discussion

The postpartum period refers to a period of 6-12 weeks after the birth of the baby and the placenta in which the bodily systems of the woman return to their pre-pregnancy state (Aksakallı et al., 2012). While trying to get used to parenthood in this period, the mother also tries to maintain communication with her baby and other members of her family (Razurel et al., 2017). In similar studies in the literature, the stress levels of mothers in the postpartum period have been associated with having more children, having an unplanned pregnancy (Bolak Boratav et al., 2016; Mete et al., 2016), inadequate social support or lower levels of social support than expected (Lee & Hwang, 2015), living outside the city center (Üst & Pasinlioğlu, 2015). As the education levels of parents increase, their skills of self-expression, coping with stress, and solution-oriented thinking are improved, and they are able to make use of opportunities in the context of healthcare services as they understand them better (Üst & Pasinlioğlu, 2015). It was also reported that care services and education services provided to mothers in the prenatal period calmed the mothers and reduced their stress levels (Uludağ & Mete, 2015). The journey of becoming parents begins with the decision and brings lifelong roles and responsibilities as the woman becomes a mother (Özdemir et al., 2021). The first minutes, hours, and days after birth are critical for the mother-baby bond, with behaviors like eye contact, touching, and observing the baby defining parenting behaviors (Koç et al., 2016; Özdemir et al., 2021). In this study, the mean PPBS score was 5.05±1.27, consistent with scores in the literature: Özdemir et al. (2021) at 5.27±1.17, Koç et al. (2016) at 4.68±1.34, and Özkan et al. (2013) at 3.20±1.95. These results indicate generally positive postpartum parenting behaviors. Factors such as education, income, and pregnancy planning were found to influence PPBS scores, while mode of delivery and baby's sex did not (Özdemir et al., 2021). Similar findings were reported by Özkan et al. (2013), who emphasized the impact of education, income, and pregnancy intention on parenting behaviors.

This study observed a positive relationship between lower postpartum stress levels and improved parenting behaviors. Similarly, studies link postpartum anxiety and depression with poorer parenting outcomes (Makeen et al., 2022) and highlight that mothers experiencing high stress show less positive parenting behaviors (Martinez-Torteya et al., 2018).

Postpartum anxiety and stress can lead to parenting behaviors that undermine caregiving roles, such as aggression, poor communication, and low responsiveness (Stewart, 2007). These issues also negatively affect breastfeeding duration, which impacts the baby's neurocognitive development (Hoff et al., 2019). Perinatal anxiety and stress constitute a maladaptive state with long-term consequences for both mother and child (Makeen et al., 2022). The findings of this study align with the literature, highlighting the importance of reducing postpartum stress to support positive parenting behaviors.

Conclusion and Recommendations

As a result, it was concluded that as postpartum stress levels of women decreased, their parenting behaviors became more positive. Considering these results, it is important to offer holistic education, counseling, and care services to women in prenatal and postpartum care processes by aiming at their development of successful and positive motherhood behaviors and keeping effective factors in mind. It can be recommended to evaluate the physical needs and psychological health of women together in the prenatal and postpartum periods, provide them with education about parenthood roles and transition to motherhood, support them, and plan and offer services to increase the self-confidence of mothers.

Ethics Committee Approval: Ethics committee approval was obtained from the Scientific Research and Publications Ethics Committee in Natural Sciences at Osmaniye Korkut Ata University (Date: 25.01.2022, Number: 2022/1/14).
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Developing The Menstrual Migraine Symptoms Scale

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ABSTRACT

Objective: The objective of this study was to develop the Menstrual Migraine Symptoms Scale (MMSS).
Methods: The study utilized a robust methodological design with a sample size of 582 participants. The data underwent a comprehensive analysis employing various statistical techniques, including item analysis, Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), Cronbach's alpha internal consistency coefficient, and the Intraclass Correlation Coefficient (ICC) for test-retest reliability.
Results: The two sub-dimensions of the scale, consisting of 19 items, demonstrated excellent internal consistency, with Cronbach's alpha coefficients ranging from 0.932 to 0.970. Furthermore, the total scale exhibited a high level of internal consistency, with a Cronbach's alpha coefficient of 0.976. The item correlation values within the scale ranged from 0.741 to 0.921, indicating strong relationships between the items.
Conclusion: The study findings conclusively demonstrated the validity and reliability of the MMSS as a robust measurement tool specifically designed for assessing female individuals.
Keywords: Menstrual migraine, scale development, symptom, reliability.

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Introduction

Migraine, a prevalent neurological disorder, affects a substantial portion of the global population, with an estimated prevalence of approximately 14% (Stovner et al., 2018). It ranks as the second most common disorder worldwide, and notably, it holds the highest prevalence among women of reproductive age (15-49 years) (Steiner et al., 2020; Stovner et al., 2018). Additionally, migraine is the leading cause of headaches in females (Barus et al., 2023; Dixon & Bergstrom, 2011).The incidence of migraine tends to increase after adolescence, affecting women more than men (Burch et al., 2018). Research suggests that hormonal fluctuations play a role in triggering this condition among women (Vetvik & MacGregor, 2017).

The International Classification of Headache Disorders (ICHD-III) defines migraine as a recurring headache disorder characterized by severe, unilateral, throbbing pain. However, it should be noted that some cases may present with bilateral or diffuse pain (Barus et al., 2023). Migraine-induced headaches impose a significant economic and social burden on patients and society at large due to loss of productivity and increased use of healthcare (Dixon & Bergstrom, 2011). This can lead to strained social relationships and reduced overall quality of life (Chen et al., 2020). Moreover, individuals with migraine are more susceptible to chronic pain, ischemic stroke, sleep disturbances, depression, anxiety, and stress (Saunders et al., 2008).

Migraine exhibits a higher prevalence and frequency in women, and there are variations in comorbidities and symptoms among individuals. For instance, women are more likely to experience accompanying symptoms like nausea, sensitivity to light (photophobia), and sensitivity to sound (phonophobia) during episodes of migraine (Ahmad & Rosendale, 2022). Studies have shown that around 60% of women with migraine experience headaches associated with menstruation, surpassing the number of non-menstrual-related migraine (Pavlović et al., 2015). Moreover, approximately 60% of women with migraine report a connection between their migraine and the menstrual cycle (Dixon & Bergstrom, 2011). It is hypothesized that the primary pathophysiological mechanisms triggering menstrual migraine (MM) attacks involve estrogen withdrawal and prostaglandin release (Ahmad & Rosendale, 2022; Vetvik & MacGregor, 2021). MM stands out from regular migraine due to its increased severity, longer duration, and reduced response to treatment.

MM also imposes personal and economic burdens, diminishing work performance, and interferes with the ability to fulfill family roles and responsibilities. A study revealed that more than half of women with migraines experienced a notable decrease in productivity at work, and that nearly 80% were unable to perform household chores during an episode of migraine (Dixon & Bergstrom, 2011).

The onset of an MM attack is believed to be pathologically linked to menstruation (Yang et al., 2022). The ICHD-III defines MM as migraines with or without aura occurring between -2 and +3 days of menstruation in at least two out of three menstrual cycles (IHS, 2018). Despite its high prevalence and adverse impact on quality of life, MM is widely acknowledged as being under-recognized and undertreated (Wang et al., 2023).

Menstrual migraine is a subtype of migraine that is closely associated with the menstrual cycle and is usually characterized by cyclic and severe symptoms (Wu et al., 2023). Although its clinical findings are well known, it is noteworthy that there is a lack of standardized and specific measurement tools to assess the unique symptoms of menstrual migraine from a patient's perspective. In general, current migraine scales assess general migraine attacks and cannot adequately reflect the physiological and emotional differences of menstrual migraine. This gap necessitates the development of a specific measuring tool that will systematically assess menstrual migraine symptoms, orient individualized care, and contribute to the relevant research.

Despite the large number of individuals suffering from MM, many do not seek treatment or receive ineffective treatment (Albarqi et al., 2022). Despite the disorder's prevalence and significant impact on individuals, MM has received limited research attention, and no scale specifically focusing on the disorder has been employed. In light of this, the current study was designed to develop the Menstrual Migraine Symptoms Scale (MMSS), addressing this research gap.

Methods

Research Design and Sample

This methodological study involved recruiting participants who met specific criteria. The inclusion criteria encompassed women who were at least 18 years old, literate in Turkish, voluntary participants, and who were within the reproductive age range of 15 to 49 years. On the other hand, the exclusion criteria involved individuals below 18 years of age, those who could not read or write Turkish, and those who did not provide their consent to participate.

To collect the data, a questionnaire was created using Google Forms, and it was shared with potential participants through social platforms such as WhatsApp, Instagram, and others. The participants were thoroughly informed about

the study, and their online consent was obtained before their involvement. Initially, a pilot study was conducted with 44 participants and based on the insights gained from this pilot study, the main study was subsequently conducted with a larger sample size of 582 participants.

The pilot study was conducted to determine how the scale items are perceived by the target audience and whether the reactions to the statements are as expected, and to identify ambiguities. With this application, the content validity findings received from expert opinions were supported, and a user-based assessment was ensured (DeVellis, 2016). In the pilot study, the sample size was kept small, and the data from this phase were not included in the scale validity analyses. In the main data collection phase, an Exploratory Factor Analysis (EFA) was conducted with 250 participants, and a Confirmatory Factor Analysis (CFA) was conducted with 332 participants. In the literature, it is recommended that EFA and CFA be conducted in separate samples (Brown, 2015; Worthington & Whittaker, 2006). Accordingly, both analyses were conducted in separate adequate sample groups.

To determine an appropriate sample size, the researchers took into consideration the recommendation that the sample size should be at least five times, or even ten times, the number of variables (Alpar, 2018; Bryman & Cramer, 2001; Tavşancıl, 2002). Therefore, the target was to reach a total of 550 participants, with 250 individuals designated for Exploratory Factor Analysis (EFA) and a minimum of 300 participants for Confirmatory Factor Analysis (CFA).

Ultimately, the study successfully reached and collected data from 582 participants, surpassing the intended sample size. In the initial stages of item analysis and EFA, 250 participants were involved, while the CFA was conducted with a separate group of 332 participants.

Data Collection

The Socio-Demographic Characteristics Form and MMSS were distributed to participants through various social platforms such as WhatsApp and Instagram. The participants completed the questionnaires using these online platforms.

Before filling in the questionnaire, the participants were informed about the purpose of the study, that the participation was based on volunteerism, and that the data would be kept confidential and only be accessed by the research team. It took an average of 10-12 minutes to complete the questionnaire. were stored in a safe encrypted digital environment that is accessible only to the research team. Although the online data collection method was advantageous in terms of reaching a large participant group, it had the potential to create selection bias since it was limited to individuals who had internet access. This limitation was taken into consideration when interpreting the study findings.

Ultimately, the study successfully reached and collected data from 582 participants, surpassing the intended sample size. In the initial stages of item analysis and EFA, 250 participants were involved, while the CFA was conducted with a separate group of 332 participants.

In the scale development process, it is recommended that EFA and CFA be conducted with different samples (Brown, 2015; Fabrigar et al., 1999). For these two analyses, however, equal sample size is not compulsory. In practice, smaller samples are generally preferred for EFA and larger samples for CFA. The main reason for this is that CFA is parametrically more complex, that the error terms and factor structure need to be clearly identified, and that the prediction by the model requires more information (sampling) (Kline, 2016). Accordingly, in this study, when the minimum recommended limit of 250 participants for EFA was reached, this group was separated for the analysis, and CFA was conducted with the remaining participants. Thus, the predictive and confirmatory power of the model was maximized by increasing the sample size in CFA. In addition, in both analyses, the sample size was above the minimum limits recommended for validity and reliability analyses in the literature (Tabachnick & Fidell, 2019; Worthington & Whittaker, 2006).

No a priori power analysis was conducted in the study. The main reason for this was that the determination of sample size in exploratory structural models such as factor analysis depends on the structure's unknown relationships (such as item factor loadings, number of factors, correlation structure) and that effect size cannot be reliably estimated in advance (MacCallum et al., 1999). Therefore, there are various "rule of thumb" recommendations in the literature. For example,Type of the Study

- Tabachnick and Fidell (2019) suggested that the sample size for EFA should be at least 100, preferably 300 and above.
- According to the COSMIN criteria, the sample size for factor analysis should be at least 100, ideally 5-10 times the number of items.
- For CFA, Kline (2016) and other studies recommended a minimum sample size of 150-200 people.
- An EFA sample of 250 participants corresponds to a total of 25 items, which meets the criterion of 10-fold per item.

- A CFA sample of 332 participants is well above the minimum recommended limit for CFA.

Furthermore, to support the adequacy of the sample, in the analyses, the KMO (Kaiser-Meyer-Olkin) measure for EFA was 0.961 (very high).

Measurement Tools

Socio-Demographic Characteristics Form, this questionnaire, which was developed by the researchers, included a total of 18 questions aimed at capturing various characteristics of the participants, such as age and marital status.

Menstrual Migraine Symptoms Scale (MMSS): Obtaining objective data in content validity calculations relies on the quality and number of experts involved in the process (Yeşilyurt & Çapraz, 2018). The initial version of the scale, comprising 25 items, was shared with 12 experts for their opinions. These experts included 11 faculty members specializing in Women's Health Nursing and one faculty member specializing in measurement and evaluation from the Department of Educational Sciences. The expert opinions were collected using an Expert Evaluation Form distributed via email.

The development of the MMSS began with the researchers creating an initial item pool based on a comprehensive literature review and expert opinions. PubMed, Scopus, and Web of Science databases were used for the literature search, with keywords including “menstrual migraine,” “migraine symptoms,” and “migraine scales” (Allais et al., 2018; Dixon & Bergstrom, 2011; Vetvik & MacGregor, 2017; Wang et al., 2023).

These resources provided insight into the symptomatology and clinical presentation of menstrual migraine and informed the content of the initial items. Additionally, the scale development process followed best practices in psychometric instrument development, including item generation, expert validation, and pilot testing (Boateng et al., 2018; DeVellis, 2016; Polit et al., 2007; Yeşilyurt & Çapraz, 2018).

The language and semantic coherence of the items were reviewed by experts in Turkish Language and Measurement & Evaluation. Then, 12 subject-matter experts (from nursing and obstetrics-gynecology) evaluated the items for content validity. Based on their suggestions, items were revised for clarity and relevance, and the item pool was finalized prior to pilot testing with a draft sample.

For the content validity study, the Lawshe technique was utilized to evaluate the expert opinions. This technique involved rating each item in the scale as "necessary," "useful, but not necessary," or "not necessary" (Doğan & Doğan, 2019). The ratings provided by the experts were used to calculate the content validity criterion (CVC) for each item. To meet the content validity criterion (CVC>0) at a significance level of α=0.05, the CVC value of each item was examined (Yeşilyurt & Çapraz, 2018).

Furthermore, the content validity index (CVI) was determined by calculating the average CVI value across all the items included in the final form. The Lawshe technique dictates that the CVI value should surpass the CVC value, signifying a greater degree of content validity. This methodology guarantees that the chosen items are deemed pertinent and suitable by the experts, thereby enabling effective measurement of the intended construct.

The scale was designed as a five-point Likert scale, ranging from 1 (“Never”) to 5 (“Always”). It comprises a total of 19 items organized into two sub-dimensions: Pain and Coping (PC), and Quality of Life (QoL). None of the items in the scale are reverse-coded. The maximum achievable score on the scale and its sub-dimensions is 100, while the minimum score is 20. A higher score on the scale indicates increased severity of symptoms of MM in female individuals.

The raw score on the scale is calculated by summing the scores from each item between 1-5. Thus, the theoretical score range for 19 items would be between 19 and 95. However, in this case, sub-dimensions with more items have a greater effect on the total score.

Statistical Analysis

Initially, 250 participants were randomly selected for EFA, while the remaining 332 participants were used for CFA. EFA involved assessing the sampling adequacy using the Kaiser-Meyer-Olkin (KMO) measure and testing the factorability using Bartlett's test of sphericity. For EFA, the factor extraction method employed was principal axis factoring, with promax chosen as the rotation method. The determination of the number of factors took into account both the scree plot (eigen value>1) and parallel analysis. Furthermore, the Cronbach's alpha value was calculated to evaluate internal consistency through item analyses. The Cronbach’s alpha coefficients obtained in all sub-dimensions of the scale developed in our study were above .80. This not only indicates acceptability, but also high internal consistency (DeVellis, 2016; Tavakol & Dennick, 2011).

CFA utilized the unweighted least squares (ULS) method for estimation. Confidence intervals for the calculated coefficients were determined using the bootstrap method with 1000 samples, and their significance was assessed. Fit statistics such as $\chi 2$, $\chi 2/df$, root mean square errors of approximation (RMSEA), standardised root mean square

residuals (SRMR), normed fit index (NFI), non-normed fit index (NNFI), comparative fit index (CFI), goodness of fit index (GFI), Hoelter's critical N, and R2 were reported. To determine a good fit, the criteria used were $\chi 2/df<3$; NFI, NNFI, CFI, GFI>0.90; and RMSEA and SRMR<0.08 (Erkorkmaz et al., 2013; Evci & Aylar, 2017; İlhan & Çetin, 2014).

For test-retest analysis, the intraclass correlation coefficient (ICC) was computed. ICC values ranging from 0.75 to 0.90 indicate good reliability, while values exceeding 0.90 indicate excellent reliability (Koo & Li, 2016). The analyses were performed using JASP software (version 0.16.1, University of Amsterdam).

Ethical Considerations

This study obtained written approval from the of Sinop University ensuring adherence to ethical standards (Date: 10.04.2023, Number: 2023/66). The study was conducted between April and May 2023, while complying with the ethical guidelines of the National Research Committee and the 1964 Declaration of Helsinki.

Results

Descriptive Statistics: Table 1 provides the distribution of participants based on their socio-demographic characteristics (Table 1).

Table 1.
Descriptive Statistics

	Study 1 (n=250)		Study 2 (n=332)	
	n	%	n	%
Marital status				
Single	195	78.00	260	78.3
Married	55	22.00	72	21.7
Educational status				
Postgraduate	25	10.00	25	7.5
High School	12	4.80	17	5.1
Secondary School	1	0.40	1	0.3
Undergraduate	212	84.80	289	87.0
Smoking				
Yes	44	17.60	56	16.9
No	188	75.20	230	69.3
Rarely	18	7.20	46	13.8
Drinking alcohol				
Yes	50	20.00	69	20.8
No	200	80.00	263	79.2
Are your periods regular?				
Yes	208	83.20	255	76.8
No	42	16.80	77	23.2
Your period cycle				
Less than 20 days	12	4.80	28	8.4
21-35 days	221	88.40	274	82.5
More than 35 days	8	3.20	13	3.9
More than 36 days	9	3.60	17	5.2
Are your periods painful?				
Always	84	33.60	116	34.9
Occasionally	147	58.80	198	59.6
Never	19	7.60	18	5.5
Do you have headaches during your periods?				
Yes	130	52.00	209	62.95
No	120	48.00	123	37.05
Have you been diagnosed with migraine?				
Yes	44	17.60	63	18.98
No	206	82.40	269	81.02
	M±SD	**Me (Min-Max)**	**M±SD**	**Me (Min-Max)**
Age	24.37±7.63	21 (15-50)	24.49±8.01	21 (18-51)
Severity of period pain	6±2.38	6 (1-10)	6±2.32	6 (1-10)
Menstrual headache severity	5.1±2.59	5 (1-10)	5.37±2.44	5 (1-10)
Migraine severity	5.93±2.84	6 (1-10)	5.78±3.25	6 (1-10)

M: Mean, SD: Standard Deviation, Me: Median, Min: Minimum, Max: Maximum

Table 2.
Item Pool

Item	Question
I-1	1. I have headaches more frequently during menstruation than during other periods.
I-2	2. My headaches during menstruation are more severe than my headaches outside of menstruation.
I-3	3. My headaches during menstruation are more sensitive to noise and sound than my headaches during other periods
I-4	4. I get nausea more often during menstruation than during other periods.
I-5	5. My headaches usually occur during my menstrual periods.
I-6	6. When I have a headache during my period, I feel the need to sleep more often than when I have headaches during other periods.
I-7	7. When I have a headache during my period, I need more silence than when I have headaches during other periods.
I-8	8. When I have a headache during my menstrual period, I need to rest in a darker environment compared to my headaches in other periods.
I-9	9. When I have a headache during my menstrual period, I use painkillers more than when I have headaches in other periods.
I-10	10. When I have a headache during my menstrual period, I do more sports than when I have headaches in other periods.
I-11	11. When I have a headache during my menstrual period, I use more non-pharmacological (non-drug) methods compared to my headaches in other periods.
I-12	12.My headaches during menstruation affect my work/school life more than my headaches in other periods.
I-13	13.My headaches during the menstrual period affect my social life more than my headaches in other periods.
I-14	14. My headaches during the menstrual period affect my concentration more than my headaches in other periods.
I-15	15.When I have a headache during menstruation, my sleep pattern changes more than when I have headaches during other periods.
I-16	16. When I have a headache during menstruation, my appetite decreases more than when I have headaches during other periods.
I-17	17. When I have a headache during menstruation, my appetite increases more than when I have headaches during other periods.
I-18	18. When I have a headache during menstruation, my daily fluid intake decreases more than when I have headaches during other periods.
I-19	19. When I have a headache during menstruation, my daily fluid intake increases more than when I have headaches during other periods.
I-20	20. When I have a headache during menstruation, I crave sweets more than when I have headaches during other periods
I-21	21. When I have a headache during menstruation, my daily life activities are affected more than when I have headaches in other periods.
I-22	22. When I have a headache during menstruation, it interferes with housework more than headaches in other periods.
I-23	23. When I have a headache during menstruation, I have less energy than when I have headaches in other periods.
I-24	24. I feel more tired when I have a headache during menstruation than when I have headaches during other periods
I-25	25. I feel more unhappy when I have a headache during menstruation than when I have headaches during other periods

Content Validity

The questions comprising the item pool can be found in Table 2. In previous literature, the CVC of the scale was reported to be 0.56 at a significance level of α=0.05 based on the opinions of 12 experts (Boateng et al., 2018; Yeşilyurt & Çapraz, 2018). In our study, the CVI of the scale was found to be 0.74, with CVC values ranging from 0.60 to 1.00. The higher CVI value obtained in our study compared to the critical CVC value indicates statistically significant content validity for the entire scale.

The revised scale, developed based on expert input, was administered to a pilot sample of 44 individuals. Following the pilot study, the scale underwent revisions based on the assessments of construct validity, item analysis, and internal consistency. Subsequently, the revised scale was administered to 99 participants at two-week intervals using the test-retest method to assess stability and determine the reliability coefficient.

Study 1

In this stage, a subset of 250 participants was randomly selected from the study's overall participant pool. EFA was conducted in sequential steps to refine the scale, eliminating items with low factor loadings, cross-loadings, or incompatible meanings. A summary of these procedures

can be found in Supplementary Table 1 after sources.

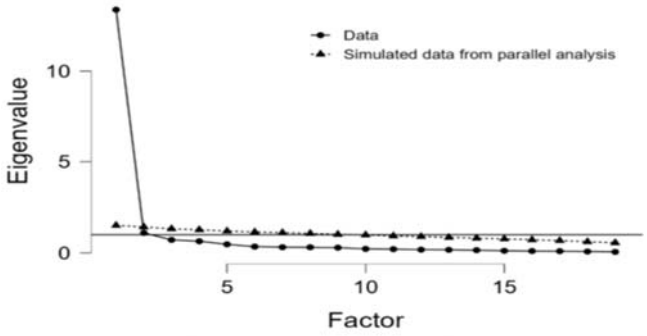

Figure 1.
Scree Plot

In the first step, items I-9 and I-11 were removed from the scale due to their factor loadings falling below 0.35. In the second step, item I-10 was excluded as its factor loading (0.316) was deemed low. Subsequently, item I-4 was eliminated from the scale as it loaded onto two different factors (0.349 and 0.458). Similarly, item I-20 was removed from the scale in the fourth step due to its association with two factors (0.482 and 0.404). In the fifth step, items I-17 and I-19, despite constituting a separate dimension, were removed because similar questions were included in a different dimension, and it was decided not to use a two-item dimension. Finally, item I-20 was reintroduced into the scale since no issues were observed with its factor loading.

Consequently, a two-factor structure was determined, supported by both the scree plot (eigen value>1) and parallel analysis methods (Figure 1).

The first factor, PC, comprised items 1, 2, 3, 5, 6, 7, and 8. The second factor, QoL, consisted of items 12, 13, 14, 15, 16, 18, 20, 21, 22, 23, 24, and 25. The KMO value for this two factor structure was 0.961, and Bartlett's test of sphericity yielded $\chi2=5796.69$ (df=171; $p<0.001$), indicating excellent sampling adequacy and factorizability (Figure 2).

The total explained variance ratio was calculated as 0.737 (0.473 for the PC factor and 0.264 for the QoL factor). The lowest factor loading obtained was 0.511. The calculated Cronbach's Alpha coefficients for the derived factors were 0.945 for PC, 0.970 for QoL, and 0.976 for the overall scale. Item analyses revealed high item-rest correlations across all items (ranging from 0.789 to 0.867 for the PC factor and from 0.741 to 0.921 for the QoL factor). Removal of any item did not improve the Cronbach's alpha value (Table 3).

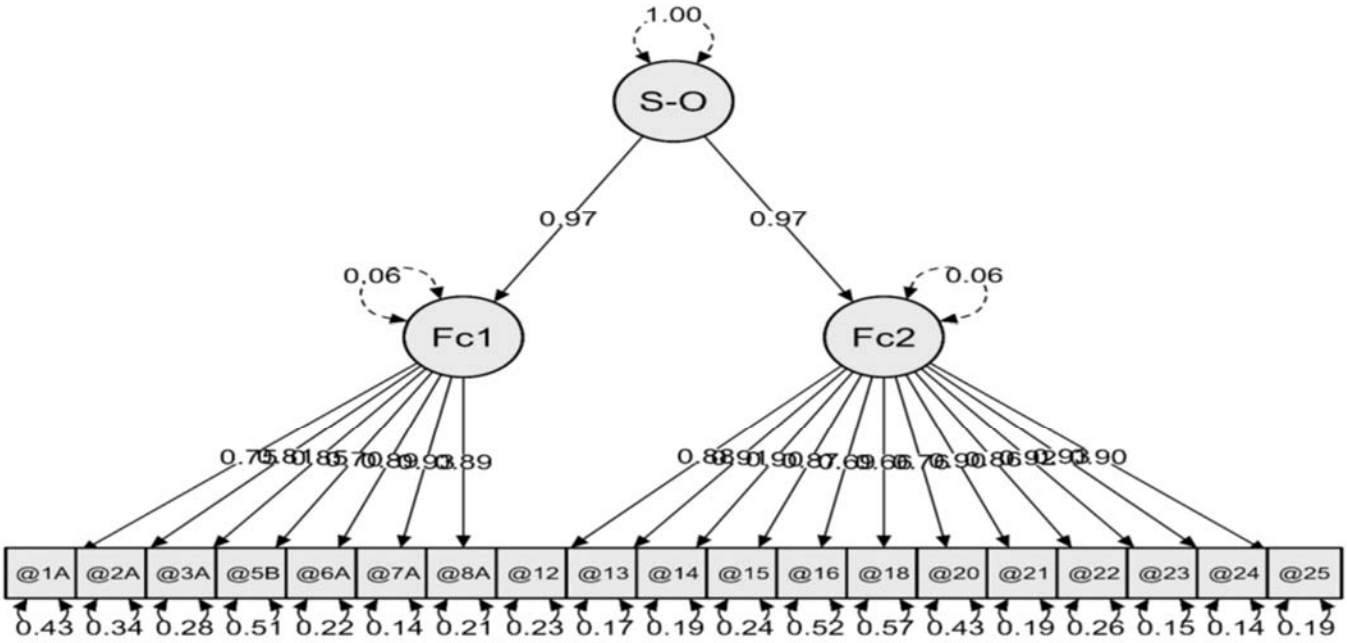

Figure 2.
Second order CFA

Table 3.
Results of Scale Adaptation Procedure

		Study 1 (n=250)				Study 2 (n=332)			ICC (n=99)
		Item Reliability Analysis			EFA[a,b]	CFA[d]			
	Item	M±SD	Item-rest correlation	Cronbach's Alpha if Item Deleted	Factpor Loadings	Est (95% CI) [e]	Std. Est.	R^2	
Pain and Coping (PC)									
	I-1	2.27±1.23	0.814	0.937	0.868	0.216 (0.173 to 0.259)	0.755	0.570	
	I-2	2.16±1.19	0.798	0.939	0.856	0.241 (0.196 to 0.287)	0.810	0.657	
	I-3	2.54±1.34	0.867	0.932	0.686	0.279 (0.231 to 0.328)	0.850	0.723	
	I-5	2.13±1.16	0.794	0.939	0.968	0.185 (0.146 to 0.224)	0.700	0.490	
	I-6	2.6±1.38	0.789	0.939	0.511	0.294 (0.241 to 0.348)	0.885	0.783	
	I-7	2.77±1.44	0.861	0.933	0.546	0.316 (0.262 to 0.37)	0.927	0.859	
	I-8	2.62±1.42	0.812	0.937	0.535	0.305 (0.251 to 0.359)	0.887	0.788	
	Total of PC	17.08±7.96	0.715[c]	CA=0.945	EV=0.473 EigV=13.429	4.005 (3.173 to 4.838)	0.970	0.941	0.900
Quality of Life (QoL)									
	I-12	2.59±1.32	0.857	0.967	0.648	0.3 (0.251 to 0.35)	0.880	0.775	
	I-13	2.57±1.31	0.888	0.966	0.781	0.309 (0.259 to 0.36)	0.911	0.829	
	I-14	2.57±1.3	0.876	0.967	0.683	0.301 (0.253 to 0.349)	0.900	0.810	
	I-15	2.56±1.33	0.882	0.966	0.736	0.289 (0.239 to 0.34)	0.872	0.761	
	I-16	2.33±1.27	0.741	0.970	0.647	0.22 (0.176 to 0.265)	0.695	0.483	
	I-18	2.13±1.17	0.683	0.971	0.634	0.193 (0.151 to 0.235)	0.655	0.429	
	I-20	2.88±1.52	0.775	0.969	0.754	0.286 (0.241 to 0.331)	0.758	0.574	
	I-21	2.66±1.36	0.881	0.966	0.946	0.31 (0.262 to 0.358)	0.899	0.808	
	I-22	2.25±1.27	0.806	0.968	0.657	0.29 (0.242 to 0.339)	0.859	0.738	
	I-23	2.73±1.44	0.921	0.965	0.978	0.319 (0.269 to 0.37)	0.923	0.852	
	I-24	2.78±1.44	0.903	0.966	0.968	0.325 (0.274 to 0.376)	0.929	0.864	
	I-25	2.75±1.41	0.876	0.966	0.931	0.324 (0.273 to 0.375)	0.901	0.812	
	Total of QoL	30.80±14.03	0.729[c]	CA=0.970	EV=0.264 EigV=1.12	3.834 (3.117 to 4.551)	0.968	0.936	0.877
Total of MMS		**47.88±21.24**	**0.685[c]**	**CA=0.976**	**EV=0.737**				**0.899**

a Extraction Method: Principal Axis Factoring. Rotation Method: Promax

b KMO=0.961 and Bartlett's Test of Sphericity: χ^2=5796.69, df=171; p<.001.

c Average interitem correlation

d Estimator: Unweighted Least Squares (ULS); Fit-statistics: χ^2 (df=150) = 245.45, p < .001; χ^2/df=1.64; RMSEA = 0.044; SRMR=0.038; NFI = 0.997; NNFI = 0.999; CFI = 0.999; GFI = 0.998; Hoelter's critical N (α = .05)=243.2.

e All Path coefficients are statistically signifcant at <0.001 significance level.

EFA: Exploratory Factor Analysis; CFA: Comfirmatory Factor Analysis; M=Mean; SD: Standard Deviation; Est= Unstandardized Factor Loadings; Std. Est= Standardized Factor Loadings; EV: Percentage of Explained Variance; EigV: Eigen Value; ICC: Intraclass Correlation Coefficient; CA:Cronbach's Alpha

Study 2

This stage involved a separate group of 332 individuals who were not part of the initial stage. The objective was to examine the factor structure obtained in the previous stage. The smallest standardized factor loading (Std. Est.) was determined to be 0.700 (R^2 = 0.490) for the first factor and 0.655 (R^2 = 0.429) for the second factor. Various fit statistics were calculated to evaluate the model's goodness of fit. The χ2 value with 150 degrees of freedom was computed as 245.45 (p < .001), resulting in a χ2/df ratio of 1.64. Other fit indices demonstrated excellent fit, including RMSEA = 0.044, SRMR = 0.038, NFI = 0.997, NNFI = 0.999, CFI = 0.999, and GFI = 0.998. Additionally, Hoelter's critical N (α = .05) was determined to be 243.2. Considering that the study was conducted with a sample size of 332 participants, exceeding the required sample size for the model at this stage (Hoelter's Critical N = 243.2), it can be concluded that the study had an adequate sample size. All fit statistics indicate a high level of model fit (Table 3).

Test-retest

The test-retest study involved 99 participants, and the ICC was calculated to assess the stability of the scale. The ICC value for the total scale was determined to be 0.899, indicating a high level of reliability. Specifically, the PC factor demonstrated an ICC of 0.900, while the QoL factor exhibited an ICC of 0.877 (Table 3).

Score Calculation

Our proposed method for calculating the scores of the scale factors and the total score is outlined below:

PC score = ((I-1 + I-2 + I-3 + I-4 + I-5 + I-6 + I-7 + I-8) / 8) × 20

QoL score = ((I-12 + I-13 + I-14 + I-15 + I-16 + I-18 + I-20 + I-21 + I-22 + I-23 + I-24 + I-25) / 12) × 20

MMS score = (PC score + QoL score) / 2

By applying this calculation, the factor and total scale scores were transformed into a standardized scale that ranges from a minimum score of 20 to a maximum score of 100. This approach ensures that the weights of the two factors are balanced for the total score.

A graphical representation of the distributions is given in Figure 3.

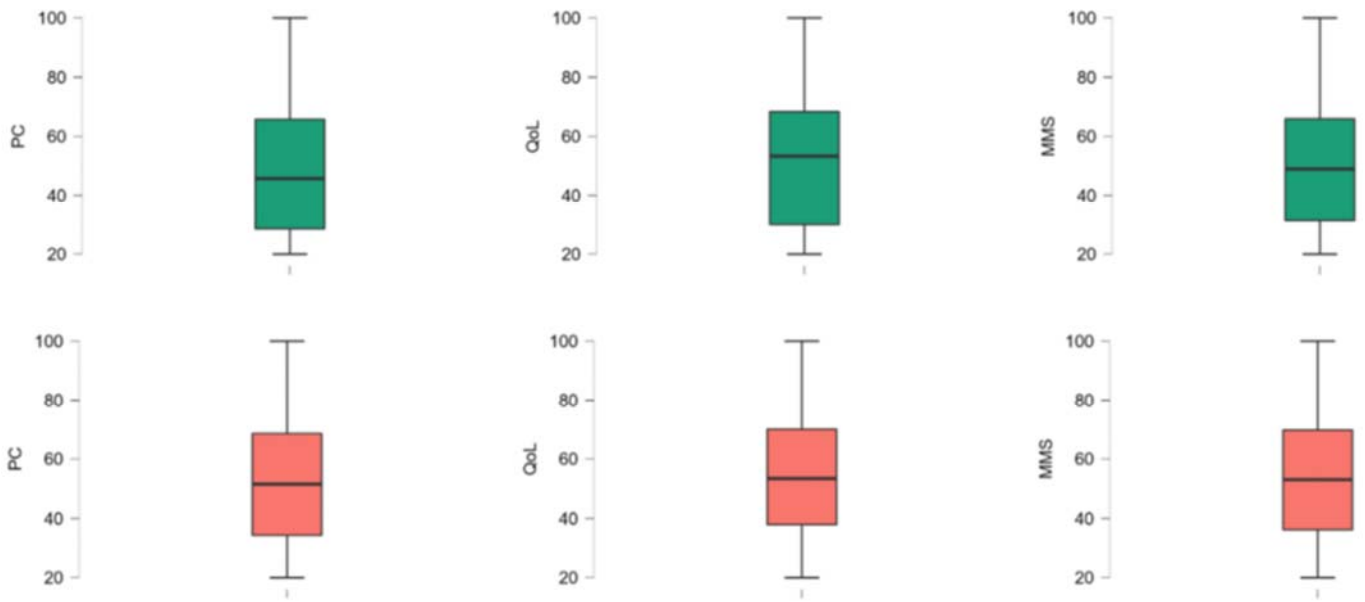

Figure 3.
Box and whisker plots for Factor and Total score of MMS (Study 1 is in first row and Study 2 is in second row)

Discussion

Migraine during menstruation can cause headaches and various symptoms in many women (Seng et al., 2022). Common symptoms include pain, nausea, vomiting, and sensitivity to sound, which can exacerbate other symptoms arttırabilmektedir (Wang et al., 2023). Additionally, various factors can trigger MM and negatively impact individuals'

quality of life (Pavlović et al., 2015). Rather than avoiding triggers, learning to cope with them can help reduce the frequency and discomfort of headache attacks (Seng et al., 2022). Therefore, the objective of this study was to develop the MMSS.

The study began by evaluating a question pool, created based on existing literature, with input from 12 academics. The items' appropriateness was assessed using a scale: 1 = "necessary item", 2 = "useful but insufficient item", 3 = "unnecessary item". The content validity rate was calculated using the Lawshe technique, and the study yielded a CVI of 0.74, which is considered acceptable (Polit, Beck, & Owen, 2007). The scale's CVC was found to be 0.56 at a significance level of $\alpha = 0.05$, indicating sufficiency based on the judgment of 12 experts (Boateng et al., 2018; Yeşilyurt & Çapraz, 2018).

Through EFA, the scale was determined to have a two-dimensional structure. The KMO measure was 0.961, and Bartlett's test of sphericity resulted in $\chi 2 = 5796.69$ (df = 171; p <.001). According to the literature, a KMO value above 0.60 and a statistically significant result for Bartlett's test of sphericity are desirable (Aslan, 2018; Bektaş, 2017; Kartal & Bardakçı, 2018).

In the pilot and general applications, the scale questions were found to be understandable, and there was a significant correlation between internal consistency scores. This demonstrates that individuals clearly comprehended the scale questions, indicating its high reliability. The reliability of the MMSS was determined to be Cronbach's $\alpha = 0.976$, indicating a highly reliable scale. The sub-dimension scores for PC yielded Cronbach's α values of 0.94, and the QoL sub-dimension had a Cronbach's alpha value of 0.97. The Cronbach's alpha coefficients obtained in all sub-dimensions of the scale developed in our study were above .80. This not only indicates acceptability, but also high internal consistency (DeVellis, 2016; Tavakol & Dennick, 2011).

In this study, both the total scale score and the sub-dimension scores exhibited high levels of reliability. Cronbach's alpha values between 0.60 and 0.79 indicate good reliability, while values greater than 0.80 indicate high reliability (Alpar, 2018). Item correlation values below 0.50 indicate poor reliability, values between 0.50 and 0.75 indicate moderate reliability, values between 0.75 and 0.90 indicate good reliability, and values above 0.90 indicate excellent reliability (Koo & Li, 2016). CFA was conducted to assess the contribution of the scale's sub-dimensions to the model and confirm the results.

The MMSS was developed with the aim of assessing the severity of symptoms experienced by women during menstruation, specifically related to MM. These symptoms have a significant impact on various aspects of women's lives, including their academic performance, work productivity, and social interactions, ultimately affecting their overall quality of life (Polat et al., 2020). Therefore, the utilization of the MMSS, a reliable and valid tool, is recommended to evaluate symptom severity in women experiencing MM. By employing this scale, healthcare professionals can effectively monitor and manage these symptoms, leading to improvements in women's quality of life.

In order to alleviate the burden of MM symptoms and headaches in women, it is crucial to identify the underlying factors contributing to this condition. This knowledge will enable the implementation of targeted interventions aimed at reducing symptom severity and improving quality of life. Therefore, further research studies are warranted to explore and compare different factors associated with menstrual migraines. The MMSS will make a valuable contribution to the existing literature by providing insights into the severity of MM symptoms in women and guiding the implementation of appropriate measures to address this issue.

Conclusion and Recommendations

In this present study, we developed the MMSS. Through rigorous evaluations, we have determined that the MMSS is a valid and reliable scale. Our aim is to introduce this scale to the scientific community as a robust and innovative measurement tool that offers a fresh perspective for women. Additionally, the scale is designed to be easily comprehensible and straightforward to answer. Considering these favorable qualities, we highly recommend the utilization of the MMSS in women with MM Syndrome. The results of our study demonstrate the scale's high validity and reliability.

Ethics Committee Approval: This study obtained written approval from the of Sinop University ensuring adherence to ethical s Informed Consent (Date: 10.04.2023 Number: 2023/66).
Informed Consent: Consent was obtained from the participating in the study.
Peer-review: Externally peer-reviewed.
Author Contributions: Concept – YÖG, MEA, AP; Design – YÖG, MEA; Supervision YÖG, MEA; Materials – YÖG, MEA, AP; Data Collection and/or Processing – YÖG,MEA,AP; Analysis and/or Interpretation - YÖG, AP; Literature Search - YÖG, MEA; Writing Manuscript – YÖG, MEA, AP; Critical Review YÖG, MEA, AP.
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Supplement Table 1.
Steps of EFA

	Step 1			Step 2			Step 3			Step 4			Step 5			Step 6		Step 7	
Item	F1	F2	F3	F1	F2	F3	F1	F2	F3	F1	F2	F3	F1	F2	F3	F1	F2	F1	F2
I-24	0.969			0.954			0.780			0.780			0.790			0.925		0.968	
I-23	0.948			0.943			0.797			0.796			0.816			0.958		0.978	
I-25	0.915			0.894			0.724			0.723			0.746			0.913		0.931	
I-21	0.908			0.914			0.832			0.833			0.852			0.944		0.946	
I-16	0.704			0.785		-0.346	1.033		-0.438	1.045		-0.444	1.034		-0.451	0.668		0.647	
I-13	0.695			0.695			0.639			0.648			0.674			0.811		0.781	
I-15	0.676			0.691			0.676			0.688			0.703			0.760		0.736	
I-20	0.666			0.673			0.485		0.407	**0.482**		**0.404**						**0.754**	
I-22	0.652			0.657			0.697			0.708			0.716			0.678		0.657	
I-18	0.569			0.609			0.783			0.799			0.791			0.662		0.634	
I-14	0.569			0.573			0.487			0.498			0.523			0.702		0.683	
I-12	0.547			0.559			0.472			0.485			0.508			0.669		0.648	
I-5		0.936			0.952			0.954			0.936			0.935			0.960		0.968
I-1		0.841			0.835			0.842			0.859			0.884			0.876		0.868
I-2		0.784			0.807			0.822			0.836			0.841			0.862		0.856
I-3		0.682			0.681			0.701			0.676			0.669			0.685		0.686
I-8		0.597		0.317	0.569			0.558		0.327	0.530		0.331	0.525		0.347	0.528		0.535
I-7		0.580		0.344	0.555			0.561		0.311	0.534		0.321	0.527		0.381	0.542		0.546
I-6		0.569			0.540			0.532			0.497			0.489		0.346	0.504		0.511
I-4		0.521		0.313	0.490		**0.349**	**0.458**											
I-17			0.931			0.973			0.924			0.930			**0.931**				
I-19			0.676			0.600			0.705			0.715			**0.667**				
I-10			0.406			**0.316**													
I-9	**0.328**																		
I-11		**0.344**																	

Note: Extraction Method: Principal Axis Factoring. Rotation Method: Promax

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Surgical Patients' Knowledge and Practices Regarding Non-Pharmacological Methods Used in Symptom Management

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ABSTRACT

Objective: This study aimed to determine the knowledge and practices of surgical patients regarding non-pharmacological methods used in symptom management.
Methods: This descriptive study was conducted with 172 patients hospitalised in the surgical clinics of a hospital in Mardin province of Türkiye. Data were collected face-to-face between the dates November 2022 and February 2023 with a patient characteristics form and questions about complementary and alternative therapies.
Results: It was determined that 64% of the patients were aware of spiritual therapy practices, and 45.3% of them always used these practices. Massage (54.1%), hot application (50.1%), and spiritual therapy (52.3%) were used to reduce pain; spiritual therapy (44.8%) was used to relieve fatigue and weakness; herbal treatment (16.3%) and spiritual therapy (20.3%) were used to relieve nausea and vomiting; spiritual therapy (57.0%) was used to reduce anxiety, fear, and stress; and spiritual therapy (30.9%) was used to relieve depressive mood.
Conclusion: It was found that the majority of the patients participating in the study knew non-pharmacological methods such as massage, hot-cold application and spiritual therapy, and nearly half of them believed in the effectiveness of these methods and preferred spiritual methods most frequently.
Keywords: Complementary therapies, nursing, patients.

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Introduction

Surgical treatment is a widely used method for diagnosis, treatment or symptom relief. Although the diseases are treated surgically, preoperative symptoms such as anxiety, pain, nausea and vomiting impair patients' quality of life (Bulut & Çilingir, 2020; Karaman Özlü et al., 2022). Effective management of symptoms experienced in the preoperative period provides faster recovery and a reduction of symptoms in the postoperative period (Karaman Özlü et al., 2022). In addition to pharmacological methods, non-pharmacological methods can also be applied to relieve these symptoms (Uraz & Günay, 2020). In many studies, it has been reported that non-pharmacological methods have positive results in reducing symptoms in the preoperative period (Schiff et al., 2019). It has been reported that the use of non-pharmacological methods has increased significantly in the last three decades due to their effectiveness in relieving various symptoms with minimal side effects (Kallush et al., 2018; Lopes-Júnior et al., 2020).

Non-pharmacological methods are attractive to patients for several reasons. Firstly, these approaches can empower patients by fostering a greater sense of control over their bodies and health. Secondly, they present viable therapeutic alternatives when conventional non-pharmacological interventions prove ineffective in symptom management. Lastly, they appeal particularly to patients who prefer to avoid conventional medical and surgical treatments (Deutsch et al., 2020). However, some patients are skeptical about the use of non-pharmacological methods in the preoperative period because they are unsure of their efficacy (Kallush et al., 2018). As a matter of fact, Demiraltı determined in his study that 72% of patients did not use non-pharmacological pain relief methods before total knee replacement surgery (Demiraltı, 2023).

Non-pharmacological methods include techniques that aim to prevent, promote, treat, and heal to integrate the physical, mental, and spiritual dimensions of human beings. They are primarily categorized into three main types: using natural products, practicing mind and body techniques, and engaging in body-based manipulations (Lopes-Júnior et al., 2020). The use of natural products includes traditional herbal methods, diet, vitamin and mineral supplements, and aromatherapy. Body and mind practices can be listed as meditation, yoga, music therapy, or spiritual therapy. Body-based manipulation practices include massage, acupuncture, acupressure, and reflexology (Karakuş Selçuk & Şen, 2021). Patients usually use one or more of the methods that they think are most suitable for them as a result of symptoms such as pain, gastrointestinal system symptoms (nausea, vomiting, constipation, etc.), fatigue, anxiety, and edema.

To evaluate the patient holistically in the preoperative period, nurses should ask patients about their knowledge and practices regarding the methods they use. Knowing the side effects of the method that patients think is effective and feel safe will prevent patients from performing applications that will cause negative consequences. In addition, it will facilitate the determination of the non-pharmacological method to be used in addition to drug treatments in the symptom management of patients. Within the scope of contemporary nursing, there is an increasing emphasis on the effective use of non-pharmacological methods to improve patient care outcomes and increase treatment efficacy (Okut et al., 2022). While the literature extensively supports the benefits of these approaches, there appears to be a significant gap in understanding patients' knowledge and practice of non-pharmacological methods in symptom management. This study aims to address this gap by identifying current patient practices and thus inform targeted nursing education to correct misconceptions and reinforce beneficial behaviours. Thus, by exploring this under-researched area, our findings will significantly contribute to evidence-based nursing care and empower patients to actively participate in symptom management and recovery through non-drug methods.

This study aimed to determine the knowledge and practices of surgical patients regarding non-pharmacologic methods used in symptom management.

Research questions

Q_1: What is the level of knowledge of surgical patients about the non-pharmacologic methods they use in symptom management?

Q_2: How often do surgical patients use non-pharmacological methods for symptom management?

Q_3: For which symptoms do surgical patients use non-pharmacological methods?

Methods

Research Type

This study was carried out using a descriptive design.

The Population/Sample of the Research

The population of the study consisted of 10,000 adult patients (the annual average number of patients hospitalized in the clinics where the study was conducted)

in a training and research hospital and a state hospital. The sample was calculated as at least 162 patients with a 5% margin of error and 80% power using the Open Epi (https://www.openepi.com/SampleSize/SSPropor.htm) online program. Day surgery patients and patients who developed complications were not included in the study. The study was completed with 172 patients who met the inclusion criteria and volunteered to participate in it.

Data Collection

The data were collected by the researchers through face-to-face interviews in the rooms of patients in the surgical clinics of the hospitals where the study was conducted between November 2022 and February 2023. The average time to complete the forms was 30 minutes.

Data Collection Tools

The data were collected using the Descriptive Characteristics Form and the Questionnaire on Non-Pharmacological Methods.

Descriptive *Characteristics Form:* In this form, which was created by the researchers by reviewing the literature, there are 14 questions about demographic data (age, gender, marital status, educational status, income level, occupation, etc.) and non-pharmacological methods they use in symptom management (sources of information about these methods, their belief in the effectiveness of these methods).

Questionnaire on Non-pharmacological Methods: In this form, which was created by the researchers by reviewing the literature, there are 51 questions about the patients' knowledge of non-pharmacological methods used in symptom management, the frequency of application, and the symptoms in which they are used (Genç et al., 2024; Tanrıverdi & Kılıç, 2023).

Data Analysis

Statistical analysis of the data was performed using the Statistical Package for Social Sciences (IBM SPSS Corp., Armonk, NY, USA) 26.0 package program. Mean, standard deviation, number and percentage distributions were calculated in the analysis of the study data.

Ethical Considerations

Ethical approval (Decision Number 2022/12-16, Date: 13.10.2022) was granted by the Research Ethics Committee of Mardin Artuklu University to conduct the study. In addition, clinical study permission was obtained from the Provincial Directorate of Health of the Governorship of Mardin (Decision NumberE-37201737-949, Date: 25.11.2021). During the data collection process, patients who volunteered to participate in the study were informed about the research and their written informed consent was obtained. In addition, this study was conducted in accordance with the Principles of the Declaration of Helsinki.

Results

It was detected that the average age of the patients participating in the study was 46.9±19.7, 51.2% were women, 70.9% were single, 50.6% were elementary school graduates, 63.4% had income equal to their expenses, 37.2% lived in the county, and 64.5% were not working. It was determined that 62.8 of the patients did not smoke, 97.7% did not drink alcohol, 69.2% did not ha a chronic disease, and 35.8% had Diabetes Mellitus. It was determined that 38.4% of the patients were hospitalized in the general surgery clinic, 53.5% had surgery before, 30.8% were previously hospitalized in the general surgery clinic, 34.3% received information regarding the non-pharmacological methods from their environment-family, and 49.4% believed the effectiveness of non-pharmacological methods (Table 1).

Table 1.
Descriptive Characteristics of Patients (n=172)

Descriptive characteristics	Min-max	Mean±SD
Age	18-97	46.9 ± 19.7
	n	%
Gender		
Female	88	51.2
Male	84	48.8
Marital status		
Married	50	29.1
Single	122	70.9
Educational status		
Literate	2	1.2
Elementary school	87	50.6
High school	51	29.7
University or more	32	18.5
Income level		
Income more than the expense	9	5.2
Income equals expenses	109	63.4
Income less than the expense	54	31.4
Residency		
Province	63	36.6
County	64	37.2
Village	45	26.2
Working status		
Working	61	35.5
Not working	111	64.5
Smoking status		
Yes	64	37.2
No	108	62.8

Alcohol use status		
Yes	4	2.3
No	168	97.7
Presence of chronic disease		
Yes	53	30.8
No	119	69.2
Type to chronic disease (n=53)*		
Diabetes Mellitus	19	35.8
Hypertension	15	28.3
Diabetes Mellitus+ hypertension	7	13.2
COPD or asthma	10	18.9
Thyroid diseases	2	3.8
Clinic where surgery was performed		
General surgery	66	38.4
Neurosurgery	22	12.8
Orthopedics	30	17.4
Ear, nose, throat	19	11.5
Urology	35	20.3
Surgery experience		
Yes	92	53.5
No	80	46.5
Previous surgery type		
None	80	46.5
General surgery	53	30.8
Neurosurgery	11	6.4
Orthopedics	13	7.6
Ear, nose, throat	8	4.7
Urology	7	4.1
Sources of information about non-pharmacological methods		
None	6	3.5
In-service training program	3	1.7
Congress, seminar, symposium	2	1.2
Television-radio, newspaper-magazine	49	28.5
Internet	53	30.8
Environment-family	59	34.3
Belief in the effectiveness of the non-pharmacological methods		
Definitely yes	85	49.4
Definitely no	5	2.9
I partially agree	42	24.4
No idea	40	23.3

It was found that 64.5% of the patients did not know relaxation exercises, 96.5% reflexology, 90.1% acupuncture, 100.0% acupressure, 94.2% therapeutic touch, 93.6% art therapy, 87.2% aromatherapy, and 74.4% yoga. It was determined that 62.2% of the patients knew massage, 59.3% hot application, 58.1% cold application, and 64.0% spiritual therapy practices (Table 2).

Table 2.
Patients' Knowledge About Non-Pharmacological Methods (n=172)

Non-pharmacological methods	I know		I partially know		I don't know	
	n	%	n	%	n	%
Relaxation exercises	24	14.0	23	13.4	125	72.7
Reflexology	2	1.2	4	2.3	166	96.5
Acupuncture	6	3.5	11	6.4	155	90.1
Acupressure	-	-	-	-	172	100.0
Therapeutic touch	2	1.2	8	4.7	162	94.2
Herbal treatment	72	41.9	49	28.5	51	29.7
Music	13	7.6	28	16.3	131	76.2
Massage	107	62.2	18	10.5	47	27.3
Hot application	102	59.3	19	11.0	51	29.7
Cold application	100	58.1	20	11.6	52	30.2
Art therapy	3	1.7	8	4.7	161	93.6
Spiritual therapy	110	64.0	10	5.8	52	30.2
Aromatherapy	7	4.1	15	8.7	150	87.2
Cupping	75	43.6	14	8.1	83	48.3
Leech therapy	45	26.2	19	11.0	108	62.8
Vacuum treatment	42	24.4	15	8.7	115	66.9
Yoga	16	9.3	28	16.3	128	74.4

*More than one answer was given

It was determined that 98.3% of the patients never used reflexology, 98.8% acupuncture, 100.0% acupressure, 97.1% therapeutic touch, 99.4% art therapy, 98.8% aromatherapy, 99.4% leech therapy, and 98.8% yoga. It was found that 45.3% of the patients always used spiritual therapy practices (Table 3).

Discussion

As a result of this study conducted to determine the knowledge and practices of non-pharmacological methods used by surgical patients in symptom management, it was determined that approximately half of the patients believed that non-pharmacological methods were effective (Table 1). In addition, it was determined that most of the patients knew massage, hot-cold application, and spiritual therapy as non-pharmacological methods (Table 2). Öztürk Birge and Mollaoğlu found that most of the patients hospitalized in internal and surgical clinics used non-pharmacological methods and believed in the effectiveness of the methods (Öztürk Birge & Mollaoğlu

2018), and Dedeli and Karadakovan found that most of the participants used non-pharmacological methods and used these methods to be healthy in their study with elderly individuals (Dedeli & Karadakovan, 2011). In addition, it has been determined that surgical patients (Wang et al., 2003), patients diagnosed with cardiovascular disease (Uçar & Canbolat, 2021) and breast cancer patients use at least one complementary method (Can et al., 2012; Gül et al., 2014; Yeşil et al., 2018). Research findings support literature. This situation shows that patients in different diagnostic groups prefer non-pharmacological methods similarly. Our study supports the idea that the use of non-pharmacological methods is a common tendency regardless of the type of disease.

It was determined that approximately half of the patients participating in the study always used spiritual therapy. It was determined that the patients used hot-cold applications, massage, and herbal treatments when necessary (Table 3). When the literature is examined, it is seen that the most frequently used non-pharmacological method by patients in studies conducted with different patient groups is prayer (Sayılan & Topçu, 2020; Can et al., 2012; Gül et al., 2014; Yeşil et al., 2018; Uçar & Canbolat, 2021; Wang et al., 2003). In contrast, James et al. reported that the most frequently used non-pharmacological methods in Sub-Saharan Africa are herbal treatments and prayer (James et al., 2018). While Öztürk Birge and Mollaoğlu reported that the most frequently used methods by patients in internal and surgical clinics were hot-cold application and massage (Öztürk Birge & Mollaoğlu, 2018), Kurt et al. reported that the most frequently used method by breast cancer patients was herbal treatment (Kurt et al., 2013). Aktaş and Kıyak also determined that most patients with irritable bowel syndrome who used non-drug methods preferred herbal treatments. They determined that patients used massage, exercise, and hot applications in small amounts (Aktaş & Kıyak, 2020). Karadağ Arlı, in her study with postoperative patients, determined that only a small percentage of patients used prayer, while the majority used more than one non-pharmacological method together (massage, music, prayer, deep breathing, etc.) (Karadag Arli, 2023). The fact that the most frequently used non-pharmacological method by the patients in our study was spiritual therapy is like this tendency observed in different patient groups. However, the fact that herbal treatment, massage, and hot-cold applications were more commonly preferred in some studies suggests that cultural differences, type of disease, and individual belief systems may be effective in method selection.

Table 3.
Frequency of Patients' Use of Non Pharmacological Methods (n=172)

Non-pharmacological methods	Always		When it is necessary		Sometimes		Rarely		Never	
	n	%	n	%	n	%	n	%	n	%
Relaxation exercises	4	2.3	12	7.0	10	5.8	13	7.6	133	77.3
Reflexology	-	-	1	0.6	-	-	2	1.2	169	98.3
Acupuncture	-	-	1	0.6	-	-	1	0.6	170	98.8
Acupressure	-	-	-	-	-	-	-	-	172	100.0
Therapeutic touch	-	-	-	-	-	-	5	2.9	167	97.1
Herbal treatment	8	4.7	35	20.3	18	10.5	29	16.9	82	47.7
Music	6	3.5	6	3.5	3	1.7	3	1.7	154	89.5
Massage	4	2.3	38	22.1	21	12.2	32	18.6	77	44.8
Hot application	2	1.2	43	25.0	21	12.2	24	14.0	82	47.7
Cold application	1	0.6	38	22.1	25	14.5	19	11.0	89	51.7
Art therapy	1	0.6	-	-	-	-	-	-	171	99.4
Spiritual therapy	78	45.3	21	12.2	6	3.5	4	2.3	63	36.6
Aromatherapy	-	-	-	-	1	0.6	1	0.6	170	98.8
Cupping	1	0.6	3	1.7	1	0.6	8	4.7	159	92.4
Leech therapy	-	-	-	-	-	-	3	1.7	169	98.3
Vacuum treatment	-	-	1	0.6	-	-	2	1.2	169	98.3
Yoga	-	-	1	0.6	-	-	1	0.6	170	98.8

It was determined that patients used massage, hot application, and spiritual therapy for pain management; spiritual therapy to relieve weakness and fatigue; herbal treatment and spiritual therapy to relieve nausea and vomiting; and spiritual therapy to reduce anxiety, fear, stress, and depressive mood (Table 4).

Table 4.
The Most Commonly Used Non-Drug Methods for Common Postoperative Symptoms (n=172)

Non-pharmacological methods	Pain		Weakness-fatigue		Nausea-vomiting		Lack of appetite		Constipation		Diarrhea		inability to urinate		cough-difficulty breathing		Bleeding		Edema		Anxiety, fear, stress		Depressed mood	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Relaxation exercises	26	15.2	20	11.6	5	2.9	-	-	-	-	-	-	-	-	-	-	-	-	5	2.9	22	12.8	6	3.5
Reflexology	3	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acupuncture	2	1.2	2	1.2	1	0.6	-	-	-	-	-	-	-	-	-	-	-	-	1	0.6	2	1.2	-	-
Acupressure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Therapeutic touch	5	2.9	2	1.2	2	1.2	-	-	-	-	-	-	-	-	-	-	-	-	1	0.6	2	1.2	-	-
Herbal treatment	66	38.4	54	31.4	28	16.3	4	2.3	3	1.7	-	-	-	-	27	15.7	-	-	24	14.0	50	29.1	6	3.5
Music	10	5.8	10	5.8	6	3.5	2	1.2	-	-	-	-	-	-	-	-	-	-	-	-	22	12.8	11	6.4
Massage	93	54.1	62	36.1	15	8.7	7	4.1	-	-	-	-	-	-	5	2.9	-	-	12	7.0	25	14.5	8	4.7
Hot application	87	50.1	41	23.9	7	4.1	1	0.6	-	-	-	-	-	-	21	12.2	-	-	3	1.7	8	4.7	2	1.2
Cold application	75	43.6	32	18.6	3	1.7	2	1.2	-	-	-	-	-	-	4	2.3	2	1.2	3	1.7	2	1.2	3	1.7
Art therapy	1	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spiritual therapy	90	52.3	77	44.8	35	20.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	98	57.0	53	30.9
Aromatherapy	2	1.2	2	1.2	1	0.6	1	0.6	-	-	-	-	-	-	-	-	-	-	1	0.6	2	1.2	1	0.6
Cupping	13	7.6	5	2.9	1	0.6	-	-	-	-	-	-	-	-	-	-	-	-	1	0.6	2	1.2	-	-
Leech therapy	3	1.7	-	-	-	-	-	-	-	-	-	-	-	-	1	0.6	-	-	-	-	-	-	-	-
Vacuum treatment	3	1.7	2	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yoga	2	1.2	2	1.2	1	0.6	1	0.6	-	-	-	-	-	-	-	-	-	-	1	0.6	2	1.2	1	0.6

When the literature was examined, it was determined that patients with stone disease used healing water and mind-body applications to reduce pain (Akpınar et al., 2024), and patients with irritable bowel syndrome used herbal treatments to reduce pain and stress (Aktaş & Kıyak, 2020). It was determined that patients in the postoperative period also generally used multiple methods to reduce pain (Karadag Arli, 2023). In our study, the preferences of patients for psychological and psychological collection, especially spiritual therapy, are similar to the symptom selection method selection seen in different patient groups. However, the fact that herbal treatment, water healing or multiple methods are more prominent in some patient groups suggests that the type of symptoms, the process of individuals, personal experiences and cultural beliefs may change the method choice.

Study limitations

This study was conducted only with patients in training and research hospital and a state hospitalin southeastern Türkiye; thus, the results cannot be generalized to the entire society. The present results may serve as a source for future research conducted with patients of different cultural backgrounds.

Conclusion and Recommendations

This study was conducted to determine the knowledge and practices of surgical patients regarding non-pharmacological methods used in symptom management. It was found that the majority of the patients who participated in the study were familiar with non-pharmacological methods such as massage, hot-cold application, and spiritual therapy, and nearly half of them believed in the effectiveness of these methods and most frequently preferred spiritual methods. It was found that patients mostly used massage, hot application, and spiritual therapy for pain; spiritual therapy for weakness and fatigue; herbal and spiritual therapy for nausea and vomiting; and spiritual therapy for anxiety, fear, stress, and depressive mood. More research should be conducted on the different types of spiritual therapy and their effectiveness. Nurses should provide counseling and support to patients about the use of non-pharmacological methods. Further studies should be conducted to obtain strong evidence on the efficacy and safety of non-pharmacologic methods in the symptom management of surgical patients.

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Reproductive Autonomy, Family Planning Attitudes and Affecting Factors in Married Women of Reproductive Age

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ABSTRACT

Objective: The aim of this study was to determine reproductive autonomy, family planning attitudes and influencing factors of married women of reproductive age.

Methods: A cross-sectional study was conducted with 344 women in Turkey between May and September 2024. Participants completed a sociodemographic form, the Reproductive Autonomy Scale, and the International Family Planning Attitude Scale. The data obtained were analysed using SPSS 25 software. Descriptive statistics and multiple linear regression analysis were used to evaluate the data. Statistical significance was assessed at the $p<.05$ level.

Results: Participants had a mean age of 33.53±7.81 years and 64.5% had university education or higher. The average reproductive autonomy level was 2.96±0.43 and the mean family planning attitude level was 138.28±23.69. Reproductive autonomy was positively correlated with educational level, family planning use and family planning attitude ($p<.05$). Educational level and employment status significantly predicted family planning attitude ($p<.05$).

Conclusion: This study contributes to the field by identifying the factors that influence the reproductive autonomy and family planning attitudes of married women in Turkey. This information can then be used to guide socio-economic planning of interventions targeting women's reproductive health. In this regard, it is recommended that educational programmes for women be expanded, employment opportunities be promoted, and community-based reproductive health services be increased.

Keywords: Family planning attitudes, reproductive age, reproductive autonomy, women.

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Introduction

Reproductive autonomy is defined as a woman's power over childbearing, pregnancy and use of family planning (Upadhyay et al., 2014). A woman's degree of reproductive autonomy encompasses the capacity to make reproductive decisions independent of undue influence from her spouse, family, society, and government (Loll et al., 2021). Enhancing access to reproductive healthcare services, including contraception and safe abortion, is linked to improved reproductive health outcomes, such as lower incidences of cesarean delivery and preterm birth (Muoto et al., 2016). Restrictions on reproductive autonomy are linked to higher incidences of unintended pregnancy and unsafe abortion, along with a greater risk of adverse reproductive health outcomes (Gerdts et al., 2016; Roberts et al., 2016; Williams et al., 2018).

Reproductive autonomy can vary across different relationships and cultural contexts, depending on the extent to which one's spouse or community supports reproductive rights (Upadhyay et al., 2014). Dursun & Gözüyeşil (2024) reported that reproductive autonomy is at a moderate level in Türkiye, which is consistent with findings from Upadhyay et al. (2014), who also identified a moderate level of reproductive autonomy in the United States. In contrast, Litorp et al. (2022) found in their study conducted in Tanzania that the majority of women make family planning decisions jointly with their spouses, and that women's independent influence in this decision-making process is limited. Reproductive autonomy is generally low in low- and middle-income countries, where education, income, and spousal support have been identified as key determinants of the decision-making process (James-Hawkins et al., 2018). Several studies have shown that factors influencing reproductive autonomy include women's decision-making power, their ability to make choices related to sexuality and fertility, the quality of communication with their partners, prevailing gender norms, educational attainment, and economic independence (James-Hawkins et al., 2018; Litorp et al., 2022; Upadhyay et al., 2014). According to data from the Turkey Demographic and Health Survey (TDHS), although the vast majority (99%) of women of reproductive age in Türkiye are aware of family planning methods, the usage rate of modern methods remains at 54%. National studies emphasize that women generally hold positive attitudes toward family planning methods; however, lack of knowledge and the necessity of spousal approval remain significant determinants in method use (Korkmaz & Hacıalioğlu, 2019; Tekgündüz & Apay, 2021). Similarly, international research has indicated that although women often express moderate and positive attitudes toward family planning, these attitudes do not always correspond to actual usage rates (Blackstone et al., 2017; Kumari et al., 2024; Li et al., 2023). Other studies have highlighted that educational level, access to accurate information, spousal support, cultural norms, and religious beliefs are influential factors shaping attitudes toward family planning (Blackstone et al., 2017; Kumari et al., 2024; Li et al., 2023).

Reproductive autonomy, which is at the core of women's and girls' health and well-being, is recognized in internationally recognized human rights treaties such as the Universal Declaration of Human Rights, the Convention on the Rights of the Child and the Convention on the Elimination of All Forms of Discrimination against Women (Starrs et al., 2018). Reproductive autonomy is widely recognized as critical to the health of reproductive women (James-Hawkins et al., 2018; Litorp et al., 2022; Mandal & Albert, 2020). Improving access to reproductive health services, including contraception and safe abortion, is associated with better reproductive health outcomes, including lower rates of cesarean delivery and preterm birth (WHO, 2024). Many qualitative studies emphasize the impact of reproductive autonomy on family planning behaviors.

Factors such as women's powerlessness, peer pressure and lack of approval, as well as poor communication between women and their partners, can hinder the use and acceptance of contraceptive methods (Dansereau et al., 2017; Ketema & Erulkar, 2018; Olakunde et al., 2019). An important dimension of reproductive autonomy is the interference of another individual, like an intimate partner or mother-in-law, through reproductive coercion or actions aimed at controlling pregnancy outcomes. This interference has been shown to heighten the risk of unintended pregnancy (Grace & Anderson, 2018). Few studies have quantitatively assessed the role of reproductive autonomy on contraceptive behavior, although these findings support the role of reproductive autonomy in explaining underuse of family planning methods.

Reproductive autonomy has not been studied except for the validity and reliability study of the Reproductive Autonomy Scale in the Turkish population. Analyzing reproductive autonomy within these contexts enables a deeper understanding of its influence on reproductive behaviors, which may subsequently contribute to the development of effective strategies for preventing unintended pregnancies. In this context, our aim was to determine reproductive autonomy, family planning attitudes and influencing factors among married women of reproductive age.

Research Questions:

What are the levels of reproductive autonomy and family planning attitudes of married women?

What are the factors affecting reproductive autonomy and family planning attitudes of married women?

Methods

Type of Study

This descriptive and cross-sectional study was planned to determine reproductive autonomy, family planning attitudes and influencing factors of married women of reproductive age.

Setting

The study was conducted online between May – September 2024 with women living at urban center located in Central Anatolia region of Turkey.

Sample of the Study

G*Power software package (G*Power, Version 3.0.10, Franz Faul, Universität Kiel, Germany) was used to calculate the sample size. A minimum of 314 participants should be included in the study with an effect size of 0.17, which is a medium effect size for a 85% power and 0.05 Type I error. The study included a total of 344 married women to increase its statistical power. Women between the ages of 18-49 years, with an education level of primary school and above, and married/partnered were included in the study. Women with psychiatric diagnosis/pre-diagnosis (self-reported), menopausal women and women with communication problems were excluded.

Data Collection Tools

Data were collected using the “Personal Information Form”, “Reproductive Autonomy Scale” and “Family Planning Attitude Scale”.

Personal Information Form: The form, prepared by the researchers after reviewing the literature, includes 11 questions inquiring about socio-demographic characteristics (age, family type, income status, etc.), obstetric and family planning (number of children, family planning method used, whether she had an unplanned pregnancy, etc.) (Dalessandro et al., 2022; Pindar et al., 2020).

Reproductive Autonomy Scale: he Reproductive Autonomy Scale (RAS) was originally developed by Upadhyay et al. (2014), and its validity and reliability study was later conducted by Dursun and Gözüyeşil (2024). This scale is designed for use with women of reproductive age and consists of 14 items divided into three sub-dimensions. The first subscale, called Decision Making, assesses who has the final say in various reproductive matters, offering three response options: 'My sexual partner' (1 point), 'Both my partner and I equally' (2 points), and 'I' (3 points). The second subscale focuses on situations where women face difficulties, while the third subscale explores the extent of communication between women and their partners (or other figures like parents or in-laws) regarding sexual and reproductive decisions. Responses in the second and third subscales follow a Likert-type format: 'Strongly disagree' (1 point), 'Disagree' (2 points), 'Agree' (3 points), and 'Strongly agree' (4 points). Since the items in the Reproductive Coercion Avoidance subscale are conceptually opposed to reproductive autonomy, reverse scoring is applied to determine the absence of coercion. The total and subscale scores are calculated by dividing the total score by the number of items, with higher scores reflecting greater levels of reproductive autonomy (Dursun & Gözüyeşil, 2024). This study found that the Cronbach alpha coefficient of the scale was 0.86.

Family Planning Attitude Scale: The Family Planning Attitude Scale (FPAS) was developed by Örsal and Kubilay (2007) as a Likert-type scale comprising 34 items. Each statement in the scale is rated on a five-point scale: '1 = Strongly agree', '2 = Agree', '3 = Undecided', '4 = Disagree', and '5 = Strongly disagree'. The FPAS allows for a minimum score of 34 and a maximum score of 170. It includes three subscales: 'Attitude Towards Childbirth', 'Attitude Towards Family Planning Methods', and 'Society's Attitude Towards Family Planning'. The 'Society's Attitude Towards Family Planning' subscale consists of 15 items, with possible scores ranging from 15 to 75. The 'Attitude Towards Family Planning Methods' subscale includes 11 items, with a minimum score of 11 and a maximum of 55. The 'Attitude Towards Childbirth' subscale is made up of 8 items, with scores ranging from 8 to 40. In the scale's validity and reliability study, the Cronbach's alpha coefficient was determined to be 0.90 (Örsal & Kubilay, 2007). This study found that the Cronbach alpha coefficient of the scale was 0.96.

Data Collection

The research data were collected between 15.05.2024-01.09.2024 through a link that can be accessed online between 15.05.2024-01.09.2024 by random sampling method, one of the non-probability sampling methods. Informed consent was obtained from the participants before the data collection tools were applied. Those who checked “Yes” to the statement “I have been informed about the research. I agree to participate.” at the end of the Consent Form answered the web survey questions. The link was delivered to married women between the ages of 18-49 via

social platforms. It took approximately 15-20 minutes to complete the data collection tools.

Statistical Analysis

Data were analyzed using SPPS 25 (IBM SPSS Corp. Released 2017.IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.) program was used for data analysis. The distributions of the data groups were examined and the means, standard deviations, quartile widths, normal distribution and histograms of the groups were evaluated. Multiple linear regression analysis was applied to determine the relationships between variables. Statistical significance was evaluated at $p<.05$ level.

Ethical Approval

The ethic approval was obtained from KTO Karatay University Drug and Non-Medical Device Research Ethics Committee (Decision Date: 09.05.2024, Decision No: 2024/015) before starting the study. The study was conducted in accordance with the principles of the Declaration of Helsinki.

Results

The study included 344 women with a mean age of 33.53±7.81 years. Of the participants, 191 (55.5%) were 33 years of age or younger and 222 (64.5%) had a university education or higher. While 194 (56.4%) of the participants were not working, 203 (59.0%) of them had an income equal to their expenses. 287 (83.9%) participants lived in the province and 310 (90.1%) had a nuclear family. Sociodemographic characteristics are given in Table 1.

Participants' Reproductive Autonomy Scale-decision making, pressure, communication subscale scores and total mean scores were 2.11±0.29, 3.61±0.51, 2.99±0.87, 2.96±0.43, respectively. The mean family planning attitude scale-society, method, pregnancy-related attitude subscale scores and total scores of the participants were 62.14±10.05, 43.84±9.61, 32.30±6.70, 138.28±23.69, respectively (Table 2).

Multiple linear regression was used to test the prediction of reproductive autonomy and family planning attitudes in relation to age, educational level, employment status, income, place of residence, family type, pregnancy experience, abortion experience, number of children and presence of unintended pregnancy. A significant regression equation was found for reproductive autonomy with an R^2adj value of 0.170 ($F=6.853$, $p<.001$).

Table 1.
Sociodemographic and Obstetric Characteristics of Participants

Age	**n (%)**
33 years and below	191 (55.5)
34 years and older	153 (44.5)
Education level	
Primary education	42 (12.2)
High School	80 (23.3)
University and above	222 (64.5)
Employment status	
Yes	150 (43.6)
No	194 (56.4)
Income status	
Income more than expenses	81 (23.5)
Income equals expenses	203 (59)
Income less than expenditure	60 (17.4)
Place of residence	
City	287 (83.4)
District	41 (11.9)
Village	16 (4.7)
Family type	
Nuclear family	310 (90.1)
Extended family	34 (9.9)
Pregnancy experience	
Yes	276 (80.2)
No	68 (19.8)
Number of children	
None	3 (9)
1	168 (48.8)
2 and above	173 (50.3)
Abortion experience	
Yes	58 (16.9)
No	286 (83.1)
Presence of unwanted pregnancy	
Yes	20 (5.8)
No	324 (94.2)
Family planning use status	
Yes	246 (71.5)
No	98 (28.5)

n: number, %: percent, p<.05

Table 2.
Comparison of Participants' Mean Sub-Scores

Reproductive Autonomy Scale			
	X±SD	Min-Max	Scale Range (Min–Max)
Decision-making	2.11 ± 0.29	1-3	1-3
Avoidance of coercion	3.61 ± 0.51	1-4	1-4
Communication	2.99 ± 0.87	1-4	1-4
Total	2.96 ± 0.43	1.29-3.64	1-3.71
Family Planning Attitude Scale			
Community attitude	62.14±10.05	25-75	15-75
Method attitude	43.84±9.61	11-55	11-55
Pregnancy attitude	32.30±6.70	8-40	8-40
Total	138.28±23.69	52-170	34-170

X: mean, SD:Standard deviation, p<.05

Education level (β=0.202, *p*=.001, =.031), family planning use (β=-0.155, *p*=.005, =.023) and family planning attitude (β=0.353, *p*<.001, =.122) were found to be significant predictors. A significant regression equation with R^2adj value of 0.190 was found for family planning attitude (F=7.713, p<.001). Education level (β=0.128, *p*<.028, =.014), employment status (β=-0.127, *p*=.029, =.014) and reproductive autonomy (β=0.344, *p*<.001, =.122) were found to be significant predictors (Table 3).

Discussion

This study was conducted to determine married women's reproductive autonomy, family planning attitudes and the factors affecting them. The average scores for the Reproductive Autonomy Scale sub-dimensions (decision-making, pressure, communication) and the total score were found to be 2.11 ± 0.29, 3.61 ± 0.51, 2.99 ± 0.87 and 2.96 ± 0.43, respectively. The total score of the Reproductive Autonomy Scale can range from 1 to 3.71, the decision-making sub-dimension from 1 to 3, the avoidance of coercion sub-dimension from 1 to 4, and the communication sub-dimension from 1 to 4. Participants were found to have high reproductive autonomy based on the scale scores; however, they exhibited less autonomy in 'decision-making' processes and more in 'communication' and 'avoidance of coercion' situations. Dias et al. (2021) reported that women have high reproductive autonomy (2.94 ± 0.32). The highest levels of autonomy were found in the 'absence of coercion' (3.43 ± 0.58) and 'decision-making' (2.54 ± 0.41) sub-dimensions, while the lowest level of autonomy was found in the 'communication' (2.77 ± 0.47) sub-dimension. Fernandes et al. (2020) reported that women in Quilombola communities had a good level of reproductive autonomy in decision-making, with scores of 2.06 ± 0.30 and 2.40 ± 0.35 respectively. However, scores for avoidance of coercion (1.90 ± 0.47) and communication (1.95 ± 0.49) were lower in these communities than in our results, as was the total reproductive autonomy score. Considering that reproductive autonomy may be affected by factors such as personal and obstetric characteristics, family and community structure, and husband/partner characteristics, it is possible that decision-making, communication, avoidance of coercion, and total reproductive autonomy may differ among the women participating in the study.

The results of this study showed that education level, family planning use and family planning attitude significantly predicted reproductive autonomy. Saleem and Pasha (2008) and Fernandes et al. (2020) reported that family planning use was associated with reproductive autonomy. The results of this study were similar to litearture. Individuals' reproductive decisions can be directly affected by increasing their level of knowledge about family planning methods. In addition, women's independent decision-making in line with their own bodies and preferences may be directly related to reproductive autonomy. Similar to this study, Princewill et al. (2017) and Saleem and Pasha (2008) reported that education level is associated with women's reproductive autonomy. Education may lead to an increase in decision-making ability, awareness and knowledge.

The study revealed that factors such as age, income, employment status, place of residence, family type, pregnancy history, abortion history, number of children, and previous unwanted pregnancies were not significant predictors of reproductive autonomy (total score). Dias et al. (2021) reported that age was not a significant predictor of reproductive autonomy in the sub-dimensions of avoiding coercion, communication and decision-making. Wollum et al. (2023) reported in their study, which was conducted in Malawi, that the number of children and their employment status were significant predictors of the sub-dimensions of avoiding coercion and communication; however, age was not found to have a significant effect on these sub-dimensions (Wollum et al., 2023). Conversely, Mangimela-Mulundano et al. (2022) found that reproductive autonomy in women was significantly associated with educational level, income status and age. In a study conducted in Ghana, Loll et al. (2021) indicated that age was a predictive variable in the communication and decision-making sub-dimensions. However, employment status and abortion experience were not significant predictors, and education status was only significant in the communication sub-dimension.

Table 3.
Multiple Regression Analysis of Participants' Sociodemographic and Obstetric Characteristics

Reproductive Autonomy						
Variables	**B (SE)**	**Lower 95% CI for B**	**Upper 95% CI for B**	**β**	***p***	**Effect size[1]**
Constant	2.598	1.906	3.291		**<.001**	0.088
Age	6.579	-0.006	0.006	0.001	.982	0.000
Education Level	0.124	0.050	0.199	0.202	**.001**	0.031
Employment status	0.082	-0.025	0.189	0.094	.130	0.007
Income status	-0.068	-0.141	0.005	-0.100	.069	0.010
Place of residence	0.027	-0.063	0.117	0.032	.558	0.001
Family type	-0.123	-0.279	0.032	-0.085	.119	0.007
Pregnancy experience	0.084	-0.053	0.220	0.077	.228	0.004
Abortion experience	-0.063	-0.193	0.068	-0.054	.346	0.003
Number of children	0.043	-0.061	0.147	0.051	.419	0.002
Presence of unwanted pregnancy	0.129	-0.075	0.333	0.070	.213	0.005
Family planning use	-0.149	-0.253	-0.044	-0.155	**.005**	0.023
Family planning scale total	0.006	0.005	0.008	0.353	**<.001**	0.122
Family Planning						
Constant	97.223	59.364	135.083		**<.001**	0.219
Age	-0.205	-0.503	0.092	-0.068	.176	0.006
Education Level	4.307	0.459	8.156	0.128	**.028**	0.014
Employment status	-6.062	-11.499	-0.625	-0.127	**.029**	0.014
Income status	1.707	-2.024	5.438	0.046	.369	0.002
Place of residence	1.395	-3.167	5.958	0.030	.548	0.001
Family type	7.084	-0.811	14.979	0.089	.078	0.009
Pregnancy experience	2.011	-4.908	8.929	0.034	.568	0.001
Abortion experience	1.856	-4.766	8.478	0.029	.582	0.001
Number of children	-3.189	-8.476	2.099	-0.070	.236	0.004
Presence of unwanted pregnancy	-8.319	-18.683	2.045	-0.082	.115	0.007
Family planning use	-2.847	-8.208	2.514	-0.054	.297	0.003
Reproductive autonomy scale total	18.818	13.348	24.288	0.344	**<.001**	0.122

B: Unstandardized coefficients; β: Standardized coefficient (SC); R^2: Coefficient of determination; SE: Standard Error; CI: Confidence Interval 1: Partial eta squared effect size (η_p^2) ; p<0.05 is considered as statistically significant.

When we compare the results of our study with those in the literature, and take into account the characteristics of the samples and cultural issues, it seems that the links between reproductive autonomy and sociodemographic variables might change depending on the circumstances.

This study determined that the mean score for women's attitudes towards family planning was 138.28 ± 23.69. The scale ranges from 34 to 170, so this value shows that women have a positive attitude. When similar studies in the literature are examined, variability is observed between different samples. For example, Tezel et al. (2015) reported an average score of 130.72 ± 26.10, whereas Korkmaz and Hacıalioğlu (2024) reported an average score of 129.37 ± 20.17. Both studies indicated positive attitudes towards family planning. In contrast, Nazik et al. (2021) reported a lower average score of 109.1 ± 18.7 in their study of married women. Gur and Sohbet (2017) found a positive attitude, with an average score of 134.99 ± 23.07, in their study conducted in the Gaziantep province. Alan Dikmen et al. (2018) found that the family planning attitude score was 94.67 ± 17.48 among Syrian women living in Turkey, indicating a moderate attitude. Gozukara et al. (2015) determined the attitude score of women living in eastern Turkey to be 124.20 ± 27.34, noting that, while it was positive, it was not at the desired level. Similarly, Bucak and Karaman (2020) reported a score of 96.7 ± 11.5 in their study of pregnant seasonal agricultural workers, indicating a low attitude towards family planning. These differences in the literature suggest that attitudes may vary depending on the environment, sociocultural level and socioeconomic conditions in which individuals live.

The results of this study showed that education level and employment status significantly predicted family planning attitudes. Nazik et al. (2021), Korkmaz and Hacıalioğlu (2024) reported that women with higher education level and working status had more positive attitudes towards family planning, and Gür and Sohbet (2017) and Bucak and Karaman (2020) stated that the higher the education level, the more positive the attitudes towards family planning were perceived. The increase in the level of education may make it more possible for working women to gain awareness by developing socially, thanks to business life.

Conclusion and Recommendations

The mean total score of the Reproductive Autonomy Scale in this study was 2.96 ± 0.43, which corresponds to positive reproductive autonomy when evaluated in the range of 1-3.71 points. The mean score on the Family Planning Attitude Scale was 138.28 ± 23.69, corresponding to a positive attitude in the 34-170 point range. Therefore, it can be concluded that women are generally decisive in their own reproductive decisions and have a positive attitude towards family planning practices. Therefore, to sustain and strengthen these positive attitudes, it is necessary to increase women's level of education, promote women-centred counselling in health services and encourage family planning education that supports spousal participation at a societal level. Additionally, health professionals are encouraged to adopt an approach that respects women's decision-making processes and organise reproductive health services accordingly.

Ethics Committee Approval: The ethic approval was obtained from KTO Karatay University Drug and Non-Medical Device Research Ethics Committee (Decision Date: 09.05.2024, Decision No: 2024/015) before starting the study.

Informed Consent: After the women participating in the study were informed about the research, verbal consent was obtained from the individuals who wanted to participate.

Peer-review: Externally peer-reviewed.

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A Creative Intervention: Mandala Art Therapy and Midwifery in Women's Health

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ABSTRACT

Art therapy covers all mind-body based approaches applied as a method to improve the psychological health of the individual in the presence of illness or any difficulty experienced by the individual. Art therapies allow the abstract and complex thoughts in the individual's mind to become concrete. One of the many different types of art therapy involves mandala. Mandala, which has a deep-rooted history, is used in art therapy today. The ease of use and accessibility of mandalas for people of all age groups have contributed positively to the treatment of various diseases. From this perspective, mandala art therapy may be beneficial for different periodic life crises in women's lives. Midwives are health professionals who play a key role in every stage of women's health. Innovative midwifery approaches to create positive results in care at all stages of women's health are also nourished by spiritual and artistic practices. The International Confederation of Midwives has also developed a holistic and continuous care model in its midwifery care philosophy, covering women's social, emotional, spiritual, cultural, psychological and physical experiences. In line with this model, midwives' incorporating spiritual and artistic therapy methods in their care practices at all stages of women's health can make a difference in the quality of care. In this review, it is aimed to investigate the application areas of mandala art therapy in the field of midwifery, to evaluate the results of mandala art therapy in these areas and to identify gaps in the literature.

Keywords: Art therapy, mandala, midwifery, women's health

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Introduction

Art therapy is a therapeutic method aimed at helping individuals express their inner experiences during illness or any challenging situations, thereby facilitating emotional and spiritual relaxation. It encompasses all mind-body-based approaches applied to improve psychological health. Art therapy allows abstract and complex thoughts in an individual's mind to be transformed into tangible forms. Emotions and thoughts are concretely expressed through artistic products such as music, dance, sculpture, drama, painting, marbling, and mandala (Chadwick, 2009; De Botton et al., 2013; Gürcan, 2020). The history of art therapy dates back to ancient times. It was first discovered in the ancient theater at the Asclepius site in Pergamon, where it was used for communication, relaxation, and therapeutic purposes, continuing its journey from the Romans to the present day (Giannini, 2004). According to the American Art Therapy Association (AATA), art therapy is a psychotherapy method that utilizes the creative process of art to improve or enhance the emotional, physical, spiritual, and mental states of individuals of all ages. This definition indicates that art therapy assists individuals in resolving conflicts and issues, developing interpersonal skills, reducing stress, managing behaviors, and increasing self-esteem and self-awareness. Additionally, it supports individuals in gaining insight into themselves (American Art Therapy Association). Numerous studies have demonstrated the positive effects of art therapy (Anolak et al., 2023; Ergür et al., 2021; Gray-Foti, 2019; Obernyer, 2006).

Mandala Art Therapy

Mandala is a term derived from Sanskrit, meaning circle, center, and completion. Essentially composed of a center and a surrounding circle, mandalas represent wholeness and have a rich historical background. Throughout history, they have been used in various cultures, including Hinduism, Islam, and Buddhism, as a method of art therapy. Although mandalas can take on different forms, such as round, octagonal, or square, they always take shape around a center. They are also described as "containers that hold energy, as "manda" refers to essence or energy, while "la" means container. It is believed that while creating a mandala, the user's current emotions or wishes are held by the mandala (A. Aksun, Interview, 2015; Çelikbaş, 2022; Beckwith, 2014; Ergür et al., 2021).

From a philosophical perspective, a mandala becomes an object that can be carried by an individual or displayed in a visible space if it is created with positive and beautiful energy. Conversely, if a mandala is made during a state of negative emotion, burning it and scattering its ashes can symbolically initiate a healing process. Throughout history, Hindus, Buddhists, and the Tibetan people have been influenced by the captivating and symbolically rich nature of mandalas, using them as ritual symbols in Asian cultures. Externally, mandalas are seen as representations of the universe; internally, they are regarded as guides for practices such as meditation (Aksun, Interview; Beckwith, 2014; Ergür et al., 2021).

In this context, mandalas are considered meditative guide-objects. According to psychiatrist Carl Gustav Jung, the mandala functions as a form of art therapy that allows for the expression of emotions and thoughts, as well as a representation of the unconscious self. Jung used mandalas as a therapeutic tool during difficult periods experienced by his patients and referred to certain dreams as “mandala dreams.” Observing that his clients found relief by drawing rose-like diagrams, Jung emphasized that mandalas foster personal wholeness and balance (Jung, 2017). He argued that coloring or drawing mandalas could serve as a way to gain insight into the individual, suggesting that such practices help access the inner world of the person. Believing in the mandala’s functions such as enhancing psychological integrity and promoting harmony, Jung adopted it as a tool for relaxation, both for himself and for his patients (Jung, 2017). Mandalas are also frequently encountered in traditional Turkish culture, appearing in everyday objects such as lacework made by elders, carpet patterns, and tea saucers. Similar center-outward expanding designs can be found in Ottoman and Persian motifs as well (Çelikbaş, 2022; Ergür et al., 2021).

From another perspective, mandala can also be considered a method of concentration. It helps calm the mind and allows the individual to perceive a sense of wholeness. While creating a mandala, the individual directs full attention to the process, thereby remaining in the present moment. Through this focused concentration, one experiences a state of mindfulness, staying away from the worries and chaos of the past or future. The individual becomes distanced from disturbing noises and confusion. Additionally, due to the various psychological effects of different colors, one's energy and emotions are also affected (Ergür et al., 2021; Taşkın, 2015).

Although mandala drawings may result in extraordinary works of art, beyond their visual appeal lies a meditative and symbolic meaning (Çelikbaş, 2022). The aesthetic quality of the final product in a mandala is irrelevant, as mandala creation serves as a form of self-expression. This removes the pressure of producing something beautiful and allows for a more authentic creative process (Babouchkina, 2015). Art activities based on creativity have been shown to have positive effects on individuals in various domains, including

spiritual, psychological, emotional, physical, and social well-being. Such creative art-based activities help individuals distance themselves from stressful situations and enable them to enter a realm where they can express their emotions and thoughts through alternative means (Özsavran, 2022).

Types of Mandalas

Mandala, as a form of art therapy in which individuals freely transfer shapes and colors onto paper as they are inspired, can be categorized based on the nature of its design. When the design is entirely created by the individual, it is referred to as an "unstructured mandala." In this method, a center point is identified on a blank sheet of paper, and concentric circles are drawn around it. The individual is free to shape and color these circles as they wish. This process results in a unique design that is entirely self-directed and reflective of the individual's inner world.In contrast, a "structured mandala" involves a pre-drawn design, created by someone else, which the individual fills in by coloring. Unlike the unstructured mandala, the form is predetermined, but the person is still free to choose how they engage with the coloring process (Ergül et al., 2021; Jung, 2017).Figure 1 presents examples of structured mandalas, while Figure 2 shows examples of unstructured mandalas.

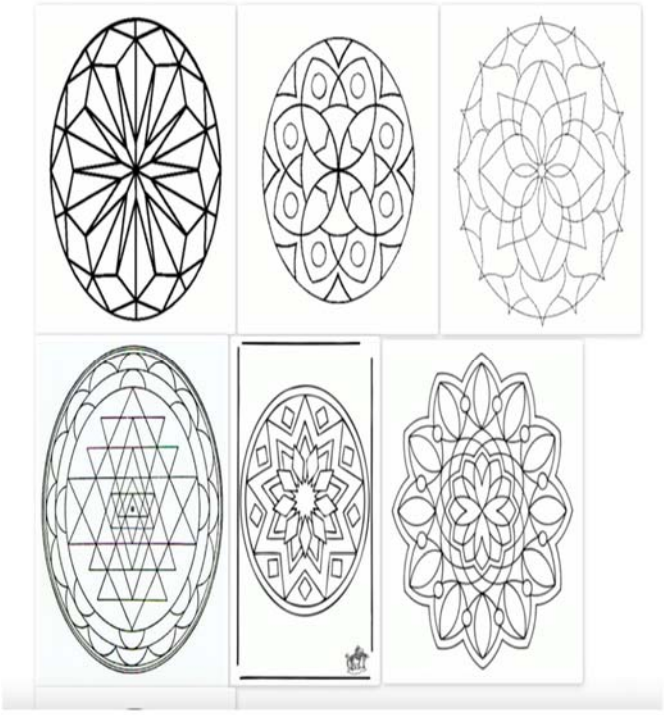

Figure 1.
Structured Mandala

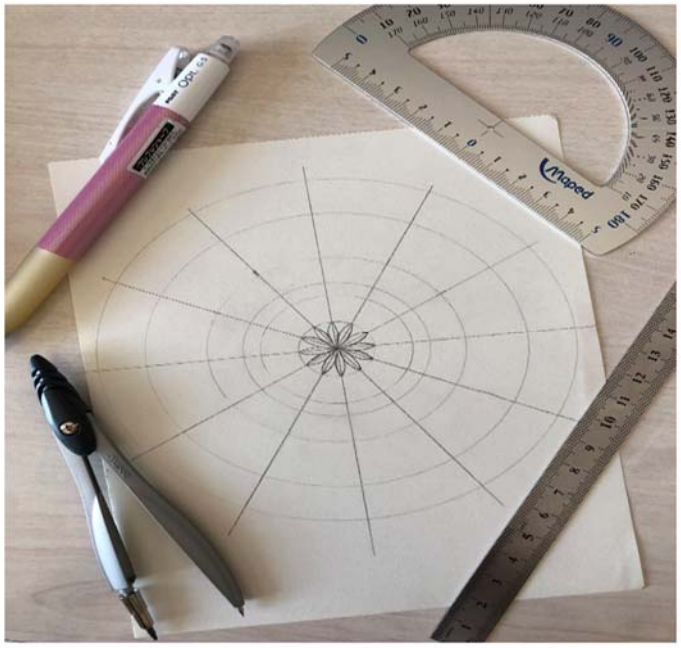

Figure 2.
Unstructured Mandala

Mandala Art Therapy and Women's Health

Today, mandala art therapy is widely utilized. It is believed that mandala art therapy supports positive psychological effects through therapeutic mechanisms underlying self-expression, self-discovery, and the creation of meaning (Cross & Brown, 2019). The fact that mandalas can be easily and comfortably used by individuals of all age groups has contributed to the treatment process of various health conditions (Ergür et al., 2021; Henderson, 2012; Kim et al., 2014). From this perspective, mandala art therapy can offer supportive benefits for women facing crises during different life stages. For example, it may serve as a helpful method in managing stress, anxiety, worry, and depression that may occur during pregnancy (Xie & Wang, 2021). In efforts to support women in coping with such crises, healthcare professionals (such as midwives and nurses) have made use of art therapy. Midwives are key healthcare providers during the prenatal, pregnancy, and postpartum periods, playing a crucial role in providing care and education to women. Introducing women to creative techniques within an appropriate environment may be a beneficial approach for this group. There are various forms of art therapy (such as painting, dance, music, and mandala) that can be used to help individuals better understand and express their emotions. These art therapy methods make non-verbal expressions visible through creative activities and can contribute positively to a person's emotional state (Bostancıoğlu & Kahraman, 2017; Çam, 2015). For instance,

pregnancy is considered a life crisis, and art therapy methods may be used to facilitate the expression and release of negative emotions and moods that may arise during this period (Bayıroğlu et al., 2023). A review of the literature reveals that mandala art therapy has proven to be a highly beneficial method across various stages of women's health. In a study examining the effects of mandala drawing and coloring on anxiety levels in pregnant women during the third trimester, it was found that participants experienced a significant reduction in anxiety levels (Amelia et al., 2020). A mandala activity implemented with infertile women undergoing embryo transfer was reported to strengthen their coping mechanisms and reduce stress levels (Şişli, 2023). Another study that explored the effects of different types of art therapy on anxiety in women during the last trimester of pregnancy found that mandala-based interventions significantly reduced anxiety (Sezen & Ünalsever, 2018). In research conducted with primiparous pregnant women, mandala activities were found to reduce fear of childbirth, and this effect was reported to continue into the postpartum period (Topçu, 2023). A separate study that investigated the impact of a combined mandala activity and technology-based breastfeeding program on breastfeeding effectiveness and mother-infant bonding found that breastfeeding self-efficacy and maternal attachment increased as a result of the intervention (Sarı & Demir, 2023). Another study aimed to determine the effects of mandala art therapy on blood glucose levels, mood, and anxiety in pregnant women with abnormal oral glucose tolerance test (OGTT) values. Although the study was completed under Clinical Trials, the results have not yet been published (Güney, 2023). Another study found that mandala coloring during the menopausal period increased quality of life and reduced anxiety levels (Kırca et al., 2024). In a study conducted with mothers of children with special needs, mandala-based art therapy was found to significantly improve the mothers' comfort levels and psychological resilience (Özsavran & Ayyıldız, 2023). In another study involving gynecological oncology patients, it was shown that postoperative mandala activities reduced both pain and anxiety levels and influenced the types of analgesic treatments used (Akyol, 2024). Similarly, in a study examining the psychological well-being of gynecologic cancer patients during the perioperative period, mandala art therapy interventions were reported to enhance patients' psychological well-being (Mengqin et al., 2024). Beyond these examples, mandala art therapy has also been utilized across a wide range of populations, including patients with dementia, children with autism spectrum disorder or learning disabilities, individuals diagnosed with insomnia, university students experiencing exam anxiety, cancer patients, bone marrow transplant recipients, bereaved individuals, and adolescents (Coar, 2010; Couch, 1997; Gençdoğan et al., 2018; Gürcan, 2020; Karagöz, 2023; Lu et al., 2017; Ratnasari et al., 2023; Yakar et al., 2021).

The Role of Mandala Art Therapy in Midwifery Practices

Midwifery practices, which are pioneering in creating positive outcomes in women's health at all stages, are also nourished by spiritual and artistic applications (Kurt, 2022). The International Confederation of Midwives (ICM) has outlined a holistic and continuous care model in midwifery care philosophy, which encompasses women's social, emotional, spiritual, cultural, psychological, and physical experiences (ICM, 2024). In line with this model, the integration of spiritual and artistic therapy methods into care practices by midwives can make a significant difference in the quality of care throughout all stages of women's health. Communication is crucial in midwifery practices (Aktaş & Pasinlioğlu, 2016). Due to factors such as women's education levels and socio-cultural background, it is not always possible for women to establish effective verbal communication. In this context, art therapy can be considered one of the most effective methods for non-verbal communication (Bostancıoğlu & Kahraman, 2017). Mandala art therapy can help reach the emotional challenges individuals face within their inner world and raise awareness, making it easier to provide support. Mandala art therapy includes both relaxation and meditation, which could be particularly effective in midwifery practices. When applied alongside intrapartum midwifery interventions, mandala art therapy can help the woman focus her attention on a single point, thereby aiding relaxation. This, in turn, can lower her pain threshold and increase her tolerance to contractions (Kaya Bayıroğlu et al., 2023).

Conclusion and Recommendations

In conclusion, based on all the studies reviewed, it can be stated that mandala art therapy can be safely used in midwifery practices. The low cost of mandala art therapy facilitates its integration into various practices. Midwives, who play a significant role in women's health at every stage, can use this therapeutic method to help women relax and encourage them to express their emotions. Furthermore, considering the areas where mandala art therapy has been applied, there appears to be no studies in the literature regarding its use in cases of abortions, perinatal loss and grieving process, postpartum period, high-risk pregnancies, and adolescent pregnancies. This indicates that the use of mandala art therapy in these areas would fill a gap in the literature and make a unique contribution. The limited number of studies in women's health regarding these issues highlights the need for further research in this area and emphasizes its importance. In this context, mandala art

therapy's potential to provide psychological and emotional support, particularly during sensitive stages of women's health, should be explored more extensively and its application should be further promoted.

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Conflict of Interest: The authors declared that they have no conflict of interest.
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Current Diet Practice: Intermittent Fasting

ABSTRACT
Obesity is defined as a condition characterized by abnormal or excessive fat accumulation that poses a risk to health. Various behavioral changes include current dietary practices. One of the contemporary dietary approaches, intermittent fasting. Intermittent fasting refers to the cycle between periods of eating and fasting. This review article aims to examine the potential effects of intermittent fasting on health. The study included randomized controlled trials (RCTs) conducted between 2013 and 2024. In the study, a total of 20 different articles were included, examining 1667 participants. Intermittent fasting holds promise for the management and alleviation of symptoms of various non-communicable diseases such as obesity, type-2 diabetes, and metabolic syndrome. While current research suggests that intermittent fasting has beneficial effects on human health, including improved metabolic health and weight management, more clinical studies are needed to better understand this interaction.
Keywords: Diet, intermittent fasting, nutrition, , obesity, type-2 diabetes.

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Introduction

Obesity is defined as an abnormal or excessive accumulation of body fat that poses a health risk. It affects more than 890 million people worldwide and is the most common chronic disease (WHO, 2025). In 2022, 2.5 billion people struggled with obesity. By 2025, one in five people are expected to be obese (Blüher, 2019; WHO, 2024). Obesity contributes to cardiovascular disease, type 2 diabetes, kidney disease, certain types of cancer, and musculoskeletal disease (Blüher, 2019; Heymsfield & Wadden, 2017). The excess adipose tissue found in obesity disrupts the balance of adipokines and cytokines, which play a metabolically active role. Similarly, high adipose tissue activates cancer signaling pathways, such as PI3K, MAPK, IKK, and STAT3 (Akil & Ahmad, 2011; Powell-Wiley et al., 2021). Various strategies have been implemented to address the growing global obesity epidemic (WHO, 2024). These include dietary changes, medications, and bariatric surgery. Bariatric surgery is reported to be the most effective method, resulting in an average weight loss of 25-30%. Glucagon-like peptide-1 (GLP-1) agonists reduce body weight by an average of 18-21%. Behavioral interventions provide an average 5-10% reduction in body weight (Roomy et al., 2024). Although bariatric surgery is the most effective method, it is also the most invasive and is associated with more complications. In contrast, lifestyle and dietary changes are the safest and least invasive alternatives. Current dietary practices are among the various behavioral modifications. One such approach is intermittent fasting, which may significantly impact weight loss and could be employed in the fight against obesity (Varady et al., 2022). This review article examines the possible health effects of intermittent fasting.

Intermittent Fasting Practice

Intermittent fasting (IF) involves cycling between eating and fasting periods (Stockman et al., 2018). There are several methods of IF with different durations according to the eating and fasting windows. The most common method is time-restricted feeding, in which individuals fast for 16–18 hours during the day and eat for 6–8 hours. Alternate day fasting (ADF), in contrast, is a type of IF in which individuals alternate between restricted eating days and normal eating days. On fasting days, caloric intake is limited to 25% of normal intake, and normal eating habits resume the following day (Malinowski et al., 2019). In recent years, IF has emerged as a potential strategy for preventing and treating obesity and cardiovascular diseases. It has been shown to improve lipid profiles, trigger a metabolic transition resulting in weight loss, and alter mitochondrial and oxidative dynamics within cells. Ultimately, these changes contribute to cardioprotection and longevity (Diab et al., 2024).

Methods

Relevant articles were thoroughly searched in electronic databases such as PubMed and Google Scholar. The search terms used included 'Fasting,' 'Diets,' 'Intermediate,' and combinations of these terms. Filters were applied to include studies published from the inception of the databases to the present. Descriptive studies, letters to the editor, book chapters, conference proceedings, literature reviews, narratives, systematic reviews with and without meta-analysis, as well as nutritional co-intervention studies, were excluded (Figure 1). The study is not a research article, so there is no ethics committee file. Throughout the study, the ethical principles of the Helsinki Declaration were followed.

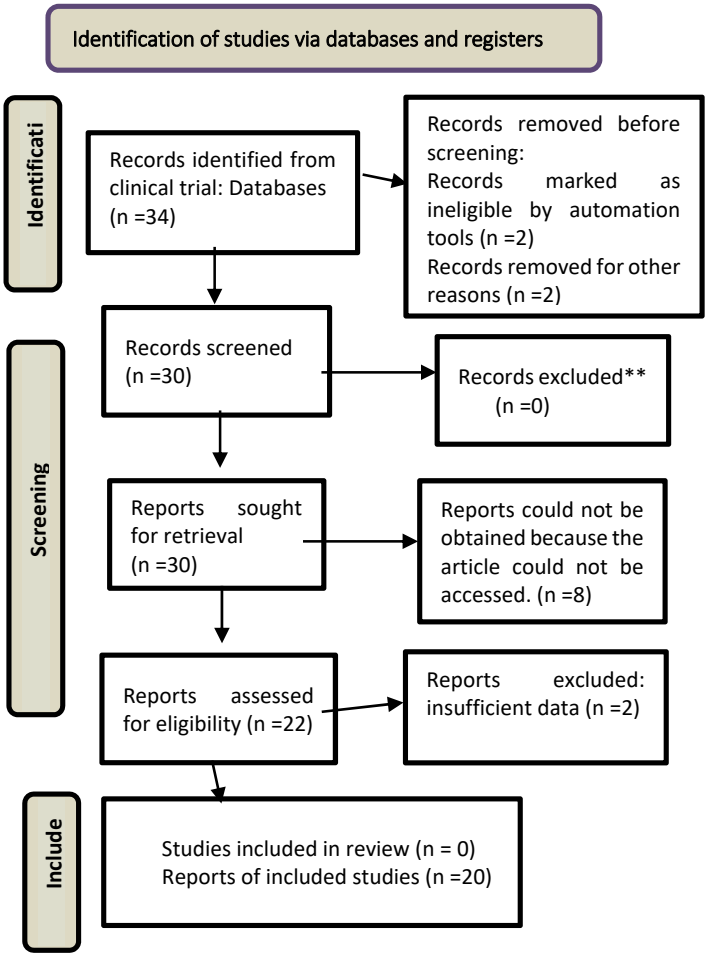

Figure 1.

PRISMA flow diagram of article selection

The effectiveness of dietary practices on diseases

Table 1 shows the effectiveness of different dietary practices on diseases.

Table 1.
Different Dietary Practices on Diseases

Participants	Number (Person)	Age	Gender	Duration	Study design, level of evidence	Dietary practice	Data collection time	Outcome	Adverse Effects	Reference
Overweight or Obese	Total: 101 Control: 34 ADF: 34 TRF: 33	18-65	Female: 64 Male: 37	3 weeks	RCT/II	ADF Group:600 kcal, TRF:16/8	T0: Baseline, T1: End of intervention, T2: 3-month follow-up	Significant reduction in body weight (-4.44-14.8kg) Significant reduction in body mass index (-2.1-2.15 kg/m^2) Significant reduction in waist circumference (-5.54-8.64cm) Decrease in blood glucose and triglyceride levels Increase in blood HDL level (0.35-0.4 mg/dl) 16/8 group: Significant BMI and weight loss T1 and T2: ADF group showed significant reduction in weight and BMI compared to the 16/8 group T1 and T2: ADF group showed a decrease in fasting blood glucose T2: 16/8 group showed a significant decrease in fasting blood glucose Improvement in HDL-C levels in the ADF group T2: 16/8 TRF group showed a significant improvement in HDL-C Improvement in LDL-C levels T1: ADF group showed a significant decrease in total cholesterol levels T1 and T2: 16/8 TRF group showed a decrease in triglycerides compared to T0 ADF is less effective than 16/8 TRF in reducing blood triglyceride levels	No severe adverse events	(Chair et al., 2022)
Type-2 Diabetes	Total: 46 Control: 24 Diet: 22	18-75	Female: 22 Male: 24	12 weeks	RCT/II	16/8, 75% energy restriction	T0: Baseline, T1: End of intervention	Serum HbA1c level decrease (7.3 ± 12.0 mmol/mol) Weight loss (4.77 ± 4.99 kg) Decrease in fat mass (3.5 ± 3.3 kg) No significant difference in resting metabolic rate T1: Decrease in insulin dosage Control group: Increase in insulin amount after 12 weeks Significant difference in perceived health change (euroqol-5D) Intermittent fasting group: Higher detection of acetic acid, dimethylsulfone, and some ketone bodies Adverse effect: Hypoglycemia	No adverse events	(Obermayer et al., 2023)

Metabolic Syndrome	Total: 39 Diet:21 Control: 18	30-50	N.M.	8 weeks	RCT/II	2 non-consecutive days a week: 75% energy restriction & 5 days: Discretionary dietary consumption	T0: Baseline, T1: End of intervention	Weight loss (3.5 ± 1.5kg) Decrease in BMI (1.3 kg/m^2) Decrease in fat mass (2.4 ± 1.6kg) Decrease in HOMA-IR (0.75 (1.20 to 0.17)) Improvement in oxidative stress levels Modulation of inflammatory cytokines Improvement in vasodilator parameters Decrease in circulating lipopolysaccharide levels No change in IL-6 and TNF-alpha levels Significant improvement in adipokine secretion Improvement in leptin and adiponectin levels Decrease in plasma MDA levels (7,35 nmol/mL) No difference in oxidized LDL levels 275.1% increase in plasma total nitrate levels Increase in short-chain fatty acid concentration in gut microbiota Dominant bacterial species: Firmicutes and Bacteroidetes	No adverse events	(Guo et al., 2021)
Metabolic Syndrome & BMI>27	Total: 65 Control:33 Diet: 32	18-65	Male: 31 Female: 34	12 weeks	RCT/II	16/8, 25% energy restriction	T0: Baseline, T1: End of intervention	8% weight loss Decrease in body fat (5.5kg) Improvement in body fat percentage Improvement in total body water and waist/hip ratio (-0,04) Improvement in lean body mass (1.75-2.71kg) Improvement in body mass index (3.06kg/m^2) Improvement in HDL cholesterol (0.38-0.53 mg/dL) Improvement in systolic and diastolic blood pressure Improvement in LDL cholesterol (15,97-17mg/dL) Improvement in total cholesterol (29.32-29.36 mg/dL) Improvement in triglycerides (40-41.84mg/dL) Improvement in fasting glucose (13.12-15.47mg/dL) Improvement in HOMA-IR, and HbA1c values	N.S.	(Kunduraci & Ozbek, 2020)
BMI>27,5 kg/m^2	Total: 20	30-65	Male: 6 Female: 14	5 weeks	RCT/II	F1-P: 1 day per week Female: 1350 kcal/day & Male: 1700 kcal/day or IF2-P: Alternating 2	T0: Baseline, T1: End of intervention	Decrease in body weight (5.2% - 7%) Reduction in waist circumference (38%) Decrease in blood pressure total cholesterol (16%-17%) Decrease in LDL cholesterol (10%-14%) Decrease in triglyceride levels (11%-21%) Decreased appetite (by 44%) and food intake (by 30%) Decrease in hunger tendency	N.S.	(Arciero et al., 2022)

						days Female: 1500 kcal/day & Male: 1800 kcal/day (35% protein, 35% carbohydrate, and 30% fat)				
Type-2 Diabetes	Total: 209	35-75	Male: 90 Female: 119	18 months	RCT/II	In three non-consecutive days per week, 20 hours of fasting with 30% energy restriction	6 months intervention & 12-month follow-up	Improvement in postprandial glucose levels starting from the 6th month Decrease in fasting nonesterified fatty acids and triglyceride levels at 2nd and 6th months Lower C-reactive protein (CRP) levels compared to standard care at 2nd and 6th months in the intermittent fasting with time-restricted eating (iTRE) group No significant difference observed in postprandial triglyceride levels between groups Reduction in serum cholesterol/HDL ratio No difference in serum ALT or AST levels	Back pain, Flu-like symptoms	(Teong et al., 2023)
BMI: 27-35 kg/m^2	Total: 228 MD: 71 WOWO: 65 TRE-6: 70 TRE-8: 66 ADD: 56	18-65	Male: 227 Female: 101	13 weeks	RCT/II	Mediterranean Diet (MD), Week on Week off (WOWO), 6-Hour Time-Restricted Eating (TRE-6), 8-Hour Time-Restricted Eating (TRE-8), Alternative Day Diet (ADD),	1st, 6th, and 12th weeks	Decrease in BMI (2.38-2.52 kg/m^2) Decrease in weight Decrease in arm circumference (3.76-4.15cm) Decrease in waist circumference (9.17-10.65cm) Decrease in hip circumference (7,3-7,51cm) No significant difference observed in body weight change trend between groups No changes in energy, carbohydrate, protein, and fat intake Increase in fiber consumption in MD and WOWO groups.	N.S.	(Erdem et al., 2022)

BMI: 30–45 kg/m^2 & Type-2 Diabetes	Total: 41 Control:19, Diet: 22	>18	N.M.	12 weeks	RCT/II	Two small snacks ranging from 2092 to 2510 kJ per day, and one light meal Men are allowed approximately 400 kJ more than women.	T0: Baseline, T1: End of intervention	Weight control (-4,2kg) Decrease in body fat (1,1%) Decrease in waist circumference (1.6cm) Improvement in serum HbA1c levels (-4mmol/mol) Improvement in fasting blood sugar levels (-1.3mmol/l) Improvement in quality of life Increase in HDL cholesterol level (0.1mmol/l) Decrease in LDL cholesterol level(0.1mmol/l) Decrease in triglycerides level (0.1mmol/l)	Hypoglycemia	(Corley et al., 2018)
Obese	Total: 10	> 65	Male: 4 Female: 6	40 weeks	RCT/II	16/8	T0: Baseline, T1: End of intervention	Weight control (-1.35kg) Decrease in Body Mass Index (BMI) (0,9kg/m^2) Decrease in waist circumference (0.2cm) Decrease in blood glucose (1.7mg/dL) Change in walking speed Improvement in quality of life.	Headaches Dizziness	(Anton et al., 2019)
Overweight & Obese (BMI>25 kg/m^2)	Total: 27	18-65	Male: 13 Female: 14	Until achieving a 5% weight loss	RCT/II	Approximately 25 % of their estimated euenergetic needs	N.A	Groups achieved similar timeframes for achieving 5% weight loss. No change in glycemia. Decrease in insulinemia. Decrease in C-peptide.	N.S.	(Antoni et al., 2018)
Obese & Type-2 Diabetes	Total: 10	18-65	Male: 1 Female: 9	6 weeks	RCT/II	1st and 2nd weeks: Normal eating pattern (breakfast, lunch, and dinner) 3rd and 4th weeks: 18-20 hours of fasting with coffee, tea, and water consumption	T0: Baseline, T1: End of intervention, T2: 2-week follow-up	Decrease in weight (1.395 kg) Decrease in BMI (0.517 kg/m^2) Decrease in morning glucose Decrease in waist circumference (2.1cm) Postprandial SMBG improvement No improvement in insulin resistance (HOMA-IR) No improvement in inflammatory markers (C-reactive protein) Caloric intake reduction Decrease in energy, carbohydrate, and fat intake Increase in IPAQ score at T1, decrease at T2	N.S.	(Arnason et al., 2017)

						allowed, 1/3 plate of protein consumption				
Obese (BMI:30-39.99 kg/m^2)	Total: 83 Control:16 Exercise: 24 Diet: 25 Combination:18	25-65	Male: 3 Female: 80	12 weeks	RCT/II	4-weeks controlled feeding period, 8-week self-selected feeding period, Controlled feeding period (weeks 1-4): Energy intake restricted by 25%, Feeding days: Unlimited food consumption	T1: End of intervention	Decrease in body weight (6 ± 4 kg) Reduction in fat mass and waist circumference No change in lean mass Decrease in LDL cholesterol levels (4-6 mg/dL) Increase in HDL levels (2±3mg/dL) Decrease in Triglycerides levels (9-13 mg/dL)	N.S.	(Bhutani et al., 2013)
Overweight & Obese (BMI>27 kg/m^2)	Total: 163	25-66	Male: 31 Female: 132	16 weeks	Randomized Open-label/II	3 days fast, 3 days CR & 1day adlibitum intake, CR: 8 weeks maintenance	T0: Baseline, T1: End of intervention	Weight loss (11.2 ± 0.6 kg) Reduction in fat mass and visceral fat percentage Improvement in LDL cholesterol levels Improvement in triglyceride levels Improvement in insulin levels Improvement in hsCRP, blood glucose, and blood pressure Improvement in transferrin saturation, ferritin, serum zinc, folate, and B12 levels Improved desire to eat, quality of life and mood	Decrease in plasma thiamine, Decrease in vitamin D levels	(Bowen et al., 2018)
Obese & Type-2 Diabetes (BMI⩾27	Total: 51	⩾18	Male: 30 Female: 33	12 weeks	RCT/II	2 days fast: 1670- 2500 kJ/day & 5 days usual diet,	T0: Baseline, T1: End of intervention	12th week: Decrease in HbA1c levels and body weight Reduction in medication dosage Decrease in body composition measurements Decrease in appetite Decrease in weight (-5.9±4%)	No adverse events	(Carter et al., 2016)

kg/m^2)						CR				
Obese & Type-2 Diabetes (BMI⩾27 kg/m^2)	Total: 137 Intermittent fasting: 70 Continuous group: 67	>18	Male: 60 Female: 77	52 weeks	RCT/II	Intermittent fasting group: Two non-consecutive days per week (500-600 kcal/day) & Normal diet for 5 days per week, Continuous group: Consistently 7 days per week (1200-1500 kcal/day)	T1: End of intervention	Increasing serum HbA1c levels (0.7±0.9%) Weight loss (5.9±4%) 24 months: Decrease in body composition, improvement in fasting glucose levels 24 months: Decrease in serum lipid levels 24 months: No difference between groups in total drug effect score 3.9kg weight loss	N.S.	(Carter et al., 2019)
Overweight & Obese (BMI:>23 kg/m^2)	Total: 31	20-65	Male: 15 Female: 16	8 weeks	RCT/II	8-week intervention: Fasting days consumed 25% of recommended energy (500 kcal/day) & Unlimited food intake on non-fasting days, Fasting days: 3 days per week	T1: End of intervention	Exercise group: Decrease in desmosterol levels. Exercise group: Decrease in cholesterol esters. Exercise group: Decrease in oxysterol levels. Physical activity level reflects desmosterol and 7-dehydrocholesterol, which are indicators of cholesterol biosynthesis and are inversely correlated with cholesterol.	N.S.	(Cho et al., 2019)
Obese (30 <BMI< 40 kg/m^2)	Total: 28	18-65	Male: 6 Female: 22	N.M..	RCT/II	3 days fast (25% of caloric needs) and 4 day full	T0: Baseline, T1: End of intervention	Both groups experienced similar weight loss Fasting RQ and ExEff increased in both groups at 10 W 3-day fasting group: Decrease in RMR No difference in appetite	N.S.	(Coutinho et al., 2018)

						caloric needs, CR				
Obese (30 <BMI< 45 kg/m^2)	Total: 46	25-65	N.M.	12 weeks	RCT/II	Baseline: 12 weeks, TRF: 12 weeks (16/8), water and calorie-free beverages allowed	T0: Baseline, T1: Week 3 T2: Week 12	2.6 ± 0.5% weight loss after 12 weeks No difference in eating disorder symptoms No difference in body image perception No difference in blood values	N.S.	(Gabel et al., 2019)
Obese (BMI≥27 kg/m^2)	Total: 244	⩾18	Male: 56 Female: 276	52 weeks	RCT/II	2 days fast (25% of calorie intake) and 5 days usual diet, CR	T0: Baseline, T1: End of intervention	Weight loss (6.6kg) No difference between groups Increase in HDL cholesterol (7%) Decrease in triglycerides (13%) No change in fasting blood glucose and LDL cholesterol	N.S.	(Headland et al., 2019)
Overweight, Obese & Women	Total: 88	18-65	Female: 88	8 weeks	RCT/II	3 days fast (32%–37% of energy requirements) and 4 days at 100% or 145% of energy requirements , CR and Control group	T1: End of intervention	Weight loss (~5kg) Reduction in fat mass (~4kg) Decrease in total and low-density lipoprotein levels Decrease in cholesterol and non-esterified fatty acids Decrease in 24-hour fasting transient insulin sensitivity	Increase in fasting insulin	(Hutchison et al., 2019)

N.M. = not mention, N.S. = not specified

Effect on Obesity

In a three-week study conducted by Chair et al. on 101 obese and overweight individuals aged 18–65 years, significant decreases in body weight, body mass index, and waist circumference were observed, as well as decreases in blood glucose, triglyceride, and total cholesterol levels, and improvements in serum HDL-C and LDL-C levels, as a result of dietary intervention. Additionally, alternate-day fasting (ADF) was less effective than 16/8 time-restricted feeding (TRF) in lowering blood triglyceride levels (Chair et al., 2022). In a different study, Arciero et al. targeted obese individuals aged 30–65 years. The study observed a decrease in body weight, waist circumference, blood pressure, total cholesterol, LDL cholesterol, and triglyceride levels as a result of the IF-1 or IF-2 diet. Additionally, the participants' desire to eat decreased, as did the amount of food they consumed and their tendency to feel hungry (Arciero et al., 2022). In a similar study, Erdem et al. targeted 228 individuals with a BMI of 27–35kg/m². Five different diets were administered to the groups: MD, WOWO, TRE-6, TRE-8, and ADD. By the thirteenth week of the dietary intervention, participants in the MD and WOWO diet groups reported decreased BMI, weight, and arm and waist circumferences, as well as increased fiber consumption. Additionally, no change in energy, carbohydrate, protein, or fat intake was observed among the diet groups (Erdem et al., 2022). Another study targeting 41 individuals with a BMI between 35 and 45 kg/m² reported that participants achieved weight control and improvements in serum HbA1c levels, fasting blood glucose levels, and quality of life. Additionally, some participants experienced hypoglycemic side effects while on the diet (Corley et al., 2018). In a different study, Anton et al. reported that weight control, changes in walking speed, and improvements in quality of life were achieved in participants who fasted for 16 hours and fed for 8 hours (16/8). Another study targeted 27 adults aged 18-65.

The study found that the groups had a similar time to reach 5% weight loss and that there was no change in glycosemia .A decrease in insulinemia and C-peptide values was also observed (Anton et al., 2018). A study in which participants fasted for 18-20 hours for six weeks found that there was no improvement in postprandial SMBG values, HOMA-IR values, or C-reactive protein levels. Additionally, a decrease in daily calorie, energy, carbohydrate, and fat intake was observed. The participants' physical activity scores increased during the T1 period and decreased during the T2 period (Arnason et al., 2017). In a 12-week study of 83 individuals with a BMI between 30 and 40, calorie restriction for four weeks resulted in decreased body weight, fat mass, and waist circumference; no difference was observed in lean muscle mass, and serum LDL cholesterol decreased while HDL increased (Bhutani et al., 2013). A study involving three-day fasting reported a decrease in serum HbA1c values, the desire to eat, body weight, drug dosage, and body composition measurements after 16 weeks (Carter et al., 2016). In a different study, Carter et al. compared groups with calorie restriction two days a week and every day. As a result of the study, participants reported increased serum HbA1c levels, weight loss, improved fasting blood glucose levels, and decreased serum lipid levels. However, there was no difference in the total drug effect score (Carter et al., 2019). In a study by Cho et al. on obese individuals, desmosterol, cholesterol ester, and oxysterol levels decreased in the exercise group as a result of restricting 75% of their daily energy intake. Additionally, desmosterol and 7-dehydrocholesterol levels, which reflect physical activity and cholesterol biosynthesis, were inversely related to cholesterol levels (Cho et al., 2019). Different studies with energy restriction observed weight loss; a decrease in resting metabolic rate (RMR); an increase in serum high-density lipoprotein (HDL)-cholesterol; a decrease in serum triglyceride, total cholesterol, and low-density lipoprotein (LDL)-cholesterol levels; a decrease in body fat mass; and a decrease in 24-hour fasting transient insulin sensitivity (Coutinho et al., 2018; Gabel et al., 2019; Headland et al., 2019; Hutchison et al., 2019). Hutchison et al. reported an increase in fasting insulin levels as a side effect.

Effect on Type-2 Diabetes

A study by Obermayer et al. examined 46 individuals with diabetes for 12 weeks with 75% energy restriction. The results showed a decrease in serum HbA1c values, weight, fat mass, and insulin dose. Additionally, higher levels of acetic acid, dimethyl sulfone, and some ketone bodies were detected in the diet groups. Hypoglycemia was reported as a side effect during the dietary intervention (Obermayer et al., 2023). In a different study, Teong et al. examined 209 individuals with diabetes and reported that postprandial glucose levels improved and the serum cholesterol/HDL ratio decreased as a result of a six-month dietary intervention. They also reported decreased fasting nonesterified fatty acid and triglyceride levels from the second month of the diet (Teong et al., 2023). A study targeting 41 individuals with diabetes and a BMI between 35 and 45 kg/m² reported that participants achieved weight control and improvements in serum HbA1c levels, fasting blood glucose levels, and quality of life. Additionally, some participants experienced hypoglycemic side effects during the diet (Corley et al., 2018). A different study in which participants fasted for 18-20 hours for six weeks reported no

improvement in postprandial SMBG values, HOMA-IR values, or C-reactive protein levels. Additionally, a decrease in daily calorie, energy, carbohydrate, and fat intake was observed. The participants' physical activity scores increased during the T1 period and decreased during the T2 period (Arnason et al., 2017). A study of obese diabetic individuals who fasted for three days reported a decrease in serum HbA1c values, the desire to eat, body weight, medication dosages, and body composition measurements after 16 weeks (Carter et al., 2016). In a similar study, Carter et al. compared groups of individuals with diabetes who restricted calories two days a week and those who restricted calories every day. The participants reported an increase in serum HbA1c levels, weight loss, an improvement in fasting blood glucose levels, and a decrease in serum lipid levels (Carter et al., 2019).

Effect on Metabolic Syndrome

In a study by Guo et al., 39 individuals diagnosed with metabolic syndrome (aged 30-50 years) participated for eight weeks. The results showed that, after two days of 75% energy restriction per week, participants experienced decreased body fat mass, improved oxidative stress levels, modulated inflammatory cytokine levels, improved vasodilator parameters, decreased circulating lipopolysaccharide levels, significant improvements in adipokine release, decreased plasma MDA levels, and increased plasma total nitrate levels. Additionally, leptin and adiponectin levels improved (Guo et al., 2021). In a study by Kunduracı and Özbek, 25% energy restriction over 12 weeks resulted in 8% weight loss and decreased body fat mass and percentage. There was also an improvement in lean body mass, total body water, body mass index, and waist-to-hip ratio, as well as an improvement in systolic and diastolic blood pressure, serum LDL cholesterol, total cholesterol, fasting blood glucose, HOMA-IR, and serum HbA1c values (Kunduracı & Özbek, 2020).

Effect of Diet on Gut

In a study by Cuo et al., 39 individuals diagnosed with metabolic syndrome and aged 30-50 years were observed for eight weeks. The researchers reported an increase in short-chain fatty acid concentration in the participants' gut microbiota as a result of 75% energy restriction for two days a week. Additionally, the dominant bacterial strains were Firmicutes and Bacteroidetes (Guo et al., 2021).

Effect of Diet on Physical Activity

Obese individuals with type 2 diabetes who fasted for 18-20 hours for six weeks had increased IPAQ scores. However, a decrease in IPAQ scores was reported during the two-week period following the dietary intervention (Arnason et al., 2017).

Side Effects of Diet

Different studies have reported side effects such as hypoglycemia, decreased plasma thiamine and vitamin D levels, and increased fasting insulin secretion (Bowen et al., 2018; Corley et al., 2018; Hutchison et al., 2019; Obermayer et al., 2023).

Sustainability

When the studies are examined, the intermittent fasting diet provides an advantage to individuals because it is simple and easy to apply. In addition, the fact that calorie restriction is in the second plan rather than different diets and the main important point is to adjust the meal time provides an advantage in terms of sustainability. Especially the 16:8 model can be easily integrated into social life.

Conclusion and Recommendations

Intermittent fasting shows promise in managing various non-communicable diseases, such as obesity, type 2 diabetes, and metabolic syndrome. Additionally, it shows potential in improving gut microbiota composition and weight control. Different intermittent fasting methods can affect blood lipid profiles, weight, blood pressure, diabetes, and gut microbiota in various ways. Furthermore, new applications can be developed by combining intermittent fasting with different diets. For instance, the 16/8 intermittent fasting regimen can be combined with the Mediterranean diet during the eating window. While current research suggests that intermittent fasting has beneficial effects on human health, including improved metabolic health and weight management, more clinical studies are needed to better understand this interaction.

Declaration of conflict of interest

The authors declare that no potential conflict of interest with respect to the research, authorship or publication of this article.

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Ethics committee approval is not required for this study.
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