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Turkish Journal of Public Health

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Publisher

Turkish Journal of Public Health

Original Article

Short Report

Technical Note

From the Editor

Advances in Large Language Models (LMM) such as GPT and the integration of artificial intelligence (AI) have initiated a transformative era for scientific research and publication. There is a rapid and increasing use of AI applications in scientific research, publishing, and authorship, as in all fields. A recent survey involving 1600 researchers indicates that the use of AI tools is expected to grow significantly in the next decade and will become "very important" and even "essential" . With their unique capacity to understand, analyze, and interpret human-like texts, these tools present significant opportunities and challenges for the scientific community. Despite the numerous advantages associated with LMMs, three benefits stand out as transformative for the field of scientific research. First, the efficiency and speed offered by these tools, through automating routine tasks such as literature reviews and manuscript formatting. Secondly, LMMs enhance the accessibility of information by summarizing and synthesizing vast amounts of scientific literature, which not only democratizes knowledge but also has the potential to speed up the pace of scientific innovation. Lastly, these models promote enhanced collaboration among scientists by providing advanced tools for shared writing and editing, effectively bridging gaps across geographical, language and disciplinary boundaries. In addition to these benefits, there are also some concerns and uncertainties. These are primarily since the underlying reasons for the information and results obtained by AI are not clear, and its systems are not transparent. Researchers are also concerned about the harm that could be caused by AI spreading misinformation. Another factor raised by the above-mentioned survey respondents commented on is the dominant part corporations are playing in the development of AI. With this regards, use of AI in drafting and generating scientific content raises concerns about authorship and intellectual property. Defining contributions and ownership becomes complex when AI tools play a significant role in the creative process. And the last, but not least, is about the ethical implications related to privacy, especially concerning data used and the risk of misuse of AI tools in fabricating or manipulating data and results in scientific publications. In this context, as public health professionals, researchers, authors, referees and editors, there is a need to improve the standards as well as the usage opportunities of AI in our field. At this stage, international guidelines constitute an important resource. Among these, COPE recommends the following determination regarding the use of AI in scientific publication. "Authors who use AI tools in the writing of a manuscript, production of images or graphical elements of the paper, or in the collection and analysis of data, must be transparent in disclosing in the Materials and Methods (or similar section) of the paper how the AI tool was used, and which tool was used. Authors are fully responsible for the content of their manuscript, even those parts produced by an AI tool, and are thus liable for any breach of publication ethics". We need a lot of study and discussion regarding the use of AI and LMM from a Public Health perspective.

In the first issue of 2024, we present nine original research articles, a short report, and a technical note for your enjoyment. We would like to express our sincere gratitude to the authors and referees who contributed to this issue and wish you pleasant reading.

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Yucel Demiral

Editor in Chief

ORIGINAL ARTICLE

Gender perception as the driving force for violence against women in Türkiye

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Abstract

Objective: The purpose of this study is to determine relationship the gender perception with attitudes toward violence against women in Türkiye.

Methods: This descriptive study was conducted online with 795 individuals from Türkiye between 08.02.2022 – 14.04.2022. The data was collected with the "Sociodemographic Descriptive Information Form," "Perception of Gender Scale," and "ISKEBE Violence Against Women Attitude Scale," created using Google Forms. For the data analysis, the Statistical Package for the Social Sciences(SPSS) version 22 was used. In addition to descriptive statistics such as frequency, mean and standard deviation, t-test, one-way analysis of variance (ANOVA) and post hoc (Tukey, LSD) tests, and linear regression were used for analysing the data.

Results: The average age of the respondents was 30.0±11.4. It was detected that 70.4% (n=560) of the respondents are female, 62.4% (n=496) are single, 75.7% (n=602) have a middle income. The participants' average point on the Perception of Gender Scale was 104.7±17.1; and the average point on the Violence Against Women Attitude Scale was 49.3±22.2. The total change in the level of the total score of the attitude toward violence against women is explained by the sum of gender perception at a rate of 37.8% (R^2=0.378).

Conclusion: Many social and cultural characteristics of participants are associated with both the perception of gender and violence against women, despite there not being a reasonable correlation between the perception of gender and violence against women.

Keywords: Gender, Perception of Gender, Violence Against Women

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INTRODUCTION

Gender is a concept that explains the values and judgments about how women and men are perceived by the society, how they are evaluated, and the behaviours expected from them.[1] The concept of gender expresses socially determined personal characteristics, roles, and responsibilities of women and men[2]. Gender inequality is an underlying determinant of violence against women[3] and a global problem.[4]

Gender inequality, causing by the unequal power dynamics between men and women within the social structure, stands as the primary root of violence against women.[3] Turkish society, like most societies in the world, has a patriarchal structure that is a cultural system giving more power, authority, and socioeconomic privileges to the men. This situation causes men to be regarded as more powerful and respected compared to women [5].

World Health Organization (WHO) defines violence against women as a public health problem. Regarding the WHO data, one in three women in the world experiences physical and/or sexual violence in their lifetime, mostly by an intimate partner [6]. Violence against women is defined as any attitude and behaviour that causes or is likely to cause physical, sexual, psychological, or economic harm or suffering to women[7].

Violence against women, which aims to oppress women, should be considered a social problem based on gender issue and should be addressed first and foremost. According to the data of the Ministry of Family and Social Services, 336 women in 2019, 267 women in 2020, and 95 women in the first four months

of 2021 were killed due to gender-based violence. Moreover, the national survey on domestic violence in Turkiye presents the high prevalence of violence that the rate of physical violence was reported as 35.5% in lifetime and 8.2% in the last 12 months.[8] A study which was conducted in 28 members of European Union shows that approximately 80% of women state that violence against women is common in their country [9]. A study conducted in Italy states that 27% of women have been exposed to physical and/or sexual violence [3].

Turkiye has raised awareness of the issue and both policymakers and non-governmental organizations have proposed various action plans to prevent violence against women. Creating and implementing programs and policies to change gender norms, promote gender equality, and empower women is a critical step toward preventing violence against women[10].

In light of this information, it is anticipated that this study, which was conducted to determine gender perceptions and attitudes toward violence against women in Turkish society, as well as the relationship between them and the factors influencing them, will serve as a guide in raising awareness and encouraging the prevention of violence against women.

METHODS

Participants and Data Collection Method

This descriptive study was conducted online in Turkiye between 08.02.2022 – 14.04.2022. The population of study formed the individuals who are the residents of Turkiye. Power analysis was performed to determine the number of people to be included in the study. Sample size was calculated with the

G*Power 3.1 program. According to the multiple regression analysis determined by Cohen (1988), the effect size was taken as 0.15 as medium. To exceed the 95% value in determining the power of the study; At the 5% significance level and 0.15 effect size, 107 people need to be reached (df=2; F=3.086)[11]. The snowball method was used to collect data in the study conducted with individuals aged 18 and over (those who could read and understand Turkish and agreed to fill out the form were included. The data was collected with the "Sociodemographic Descriptive Information Form," "ISKEBE Violence Against Women Attitude Scale," and "Perception of Gender Scale," created by using Google Forms. The link for the questionnaire was sent to participants via e-mail and social media. The questionnaire was also encouraged to share in networks of the participants. Upon receiving and clicking the link for the research, the participants were automatically directed to a page containing information about the research and informed consent. After approving to participate in the questionnaire, sociodemographic data were filled in, followed by the scales that the participants were required to answer.

Data Collection Tools

Sociodemographic Descriptive Information Form: It is an information form consisting of 10 questions prepared by the researcher in accordance with the literature and containing the sociodemographic characteristics of individuals (age, gender, marital status, number of children, family type, income status) and their witnessing and exposure to violence [3,4,5].

Perception of Gender Scale: Altınova and Duyan (2013) developed and tested the validity and reliability of this scale, and they designed it specifically for adults. The scale assesses individuals' attitudes toward how they perceive the gender roles in various fields. The scale has 25 items in total and the Cronbach's alpha coefficient was calculated as 0.872. The scale's items were prepared in the format of five-point Likert scale, with 10 positive items and 15 negative items. In the scale, participants are asked to rate each item as "strongly agree (5), agree (4), undecided (3), disagree (2), strongly disagree (1)". The total score is calculated by reversing the 2nd, 4th, 6th, 9th, 10th, 12th, 15th, 16th, 17th, 18th, 19th, 20th, 21st and 25thitems. The scale yields scores ranging from 25 to 125, with high scores indicating a positive perception of gender [12]. Cronbach's alpha coefficient of this study was calculated as 0.912.

ISKEBE Violence Against Women Attitude Scale: The scale, developed by Kanbay in 2016, is in the format of a five-point Likert scale and consists of two factors and 30 items[13]. The scale has two subscales as "Attitude towards the body" and "Attitude towards the identity". They are categorized as Attitude towards the body (Sexual and physical violence): 16 items (3, 4, 8, 9, 10, 12, 14, 15, 16, 17, 20, 22, 25, 26, 28, and 30) and Attitude towards the identity (psychological and economic violence): 14 items (1, 2, 5, 6, 7, 11, 13, 18, 19, 21, 23, 24, 27, and 29). The 5th and 24th items are scored in reverse. The scale's total score is calculated by adding the scores from the two factors. The scale has five answer options as follows: 1-strongly agree, 2-agree, 3-undecided, 4-disagree, 5-strongly disagree. Each question is scored between 1 and 5. High scores indicate that the participant opposes violence against women, while low scores indicate that the participant does not oppose violence. The

first factor can be scored with a minimum of 16 points and a maximum of 80 points. The second factor can be scored with a minimum of 14 points and a maximum of 70 points. The minimum score that can be obtained from the overall scale is 30 and the maximum score is 150. As the scale score increases, so does the positive attitude toward women. Kanbay determined the Cronbach Alpha value of the scale as 0.86. Cronbach's alpha coefficient of this study was calculated as 0.956.

Statistical Analysis

The research data was evaluated with Statistical Package for Social Sciences (SPSS) 22.0 software. In the evaluation of numerical data, arithmetic mean, standard deviation values; frequency distributions and percentages were used to summarize categorical data. Kurtosis and Skewness values were examined to determine the normality of the variables, and all variables were normally distributed. Correlation and linear regression analyses were used to investigate the relationship between the dimensions determining the scale levels of the participants. Correlation coefficients (r) for absolute values of r, 0-0.19 is regarded as very weak, 0.2-0.39 as weak, 0.40-0.59 as moderate, 0.6-0.79 as strong and 0.8-1 as very strong correlation[14].

T-test, one-way analysis of variance (ANOVA), and post-hoc (Tukey, LSD) analyses were used to examine the differences in scale levels based on descriptive features. For the analyses, p-value cut-off of 0.05 was used to determine significance.

RESULTS

The average age of the participants is 30.04±11.38 years. Of the participants, 70.4% (n=560) are female, 37.6% (n=299) are married, 81.8% (n=650) lives in a nuclear family, 75.7% (n=602) have a middle income, 37.0% (n=294) are students, 13.6% (n=108) are housewives, 16.6% (n=132) are workers/ civil servants/self-employed, 49.7% (n=395) lives in the city (Table 1). The participants' point average on the perception of gender scale is 104.7±17.1 the point average on the violence against women attitude scale is 49.3±22.1 "Attitude towards the body" has a point average of 20.5±10.9 and "Attitude towards the identity" has a point average of 28.8±13.8.

The total score of the perception of gender scale differs significantly by age (p<0.05) and the violence against women attitude scale (p=0.018). The participants' scores for attitudes toward identity differ significantly by age (p<0.05). Gender perception total score (p=0.017) and attitude towards identity scores (p=0.014) differ significantly according to income status (Table 1). Participants' gender perception scale total scores (p<0.05), violence against women attitude scale total scores (p<0.05) and attitude towards identity scores differ significantly according to educational status (p<0.05) (Table 2).

Table 1. Differences in scale scores based on descriptive demographic characteristics

Characteristics	n	%	Perception of Gender Total	Violence Against Women Attitude Total	Attitude Toward the Body	Attitude Toward the Identity
	n	*%*	*Mean±SD*	*Mean±SD*	*Mean±SD*	*Mean±SD*
Gender						
Female	560	70.4	108.2±14.7	45.5±20.4	19.1±9.6	26.3±12.9
Male	235	29.6	96.4±19.3	58.5±23.6	23.6±13.0	34.9±13.9
t test			9.3	-7.8	-5.3	-8.3
p value			**<0.01**	**<0.01**	**<0.01**	**<0.01**
Marital Status						
Married	299	37.6	99.1±18.3	53.6±21.7	21.1±10.1	32.4±14.3
Single	496	62.4	108.1±15.3	46.7±22.1	20.1±11.4	26.7±12.9
t test			-7.4	4.3	1.3	5.9
p value			**<0.01**	**<<0.01**	0.181	**<<0.01**
Number of Children						
No Child	516	64.9	108.1±15.3	46.6±21.8	19.9±11.1	26.8±13.1
1 Child	73	9.2	104.4±16.1	49.9±22.9	20.4±11.2	29.5±14.2
2 Children	131	16.5	97.9±18.5	53.4±18.6	20.8±8.7	32.7±12.8
3 and More Children	75	9.4	93.9±18.8	59.9±25.1	24.1±12.1	35.8±15.7
F test			25.9	10.0	3.3	14.4
p value			**<0.01**	**<0.01**	**0.02**	**<0.01**
PostHoc			1>3. 2>3. 1>4. 2>4 (p<0.05)	3>1. 4>1. 4>2. 4>3 (p<0.05)	4>1. 4>2. 4>3 (p<0.05)	3>1. 4>1. 4>2 (p<0.05)
Family Type						
Nuclear Family	650	81.8	105.0±16.9	49.1±22.5	20.4±11.3	28.7±13.8
Extended Family	121	15.2	102.9±18.0	51.1±20.8	21.2±9.7	29.9±13.3
Broken Family	24	3.0	104.7±17.6	46.7±20.0	19.0±6.6	27.7±14.6
F test			0.73	0.56	0.47	0.46
p value			0.48	0.56	0.62	0.62

Table 2. Differences in scale scores based on descriptive socio-economic and place characteristics

Demographics	n	%	Perception of Gender Total	Violence Against Women Attitude Total	Attitude Toward the Body	Attitude Toward the Identity
			Mean±SD	*Mean±SD*	*Mean±SD*	*Mean±SD*
Income Status	n	%				
High	103	13.0	107.2±15.3	45.5±20.4	19.7±10.6	25.8±12.3
Middle	602	75.7	104.9±16.7	49.4±22.1	20.4±10.8	28.9±13.7
Low	90	11.3	100.4±20.0	52.9±23.9	21.4±11.7	31.5±14.9
F test			4.1	2.7	0.6	4.2
p value			**0.01**	0.06	0.54	**0.01**
PostHoc			1>3. 2>3 (p<0.05)			2>1. 3>1 (p<0.05)
Education						
Primary School	74	9.3	97.5±17.6	57.9±23.9	22.8±11.9	35.1±14.5
Middle School	39	4.9	91.8±19.8	58.4±21.9	23.1±12.3	35.3±12.8
Highschool	124	15.6	99.8±19.4	53.9±21.7	21.1±9.1	32.8±15.0
Under Graduate	506	63.6	107.3±15.4	47.1±21.9	19.9±11.2	27.1±13.1
Graduate	52	6.5	110.9±13.5	40.6±15.6	18.4±8.6	22.2±9.5
F test			17.3	9.5	2.3	14.5
p value			**<0.01**	**<0.01**	0.05	**<0.01**
PostHoc			4>1. 5>1. 3>2. 4>2. 5>2. 4>3. 5>3 (p<0.05)	1>4. 2>4. 3>4. 1>5. 2>5. 3>5. 4>5 (p<0.05)		1>4. 2>4. 3>4. 1>5. 2>5. 3>5. 4>5 (p<0.05)
Occupation	n	%				
Student	294	37.0	109.5±14.6	46.03±22.12	20.0±11.6	26.0±12.7
Housewife	108	13.6	97.7±17.2	56.56±22.58	21.5±11.1	35.0±14.2
Worker/Officer/ Freelancer	132	16.6	97.8±19.9	55.85±23.34	22.4±11.6	33.5±14.6
Health Worker	100	12.6	106.5±16.1	44.75±18.35	18.7±8.3	26.0±12.4
Educator (academician/teacher)	48	6.0	109.9±13.1	42.22±19.32	19.2±10.5	23.0±10.3
Retired	22	2.8	102.4±17.5	51.63±17.01	20.9±8.6	30.7±12.0
Other	91	11.4	103.6±16.7	50.0±22.2	20.4±10.4	29.6±14.2
F test			12.5	6.8	1.4	11.3
p value			**<0.01**	**<0.01**	0.19	**<0.01**
PostHoc			1>2. 4>2. 5>2. 7>2. 1>3. 4>3.5>3. 7>3. 1>7. 5>7 (p<0.05)	2>1. 3>1. 2>4. 3>4.2>5. 3>5. 7>5. 2>7. 3>7 (p<0.05)		2>1. 3>1. 7>1. 2>4.3>4. 2>5. 3>5. 6>5. 7>5. 2>7. 3>7 (p<0.05)

Table 2. (contuniued) Differences in scale scores based on descriptive socio-economic and place characteristics

Longest Lived Place	n	%				
Province	395	49.7	105.7±16.3	47.3±20.7	19.8±10.1	27.6±12.9
District	249	31.3	105.5±15.7	49.8±22.9	20.8±11.8	29.1±13.8
Village/town/rural	151	19.0	100.7±20.4	53.6±23.8	21.8±11.5	31.8±15.5
F test			5.2	4.6	2.0	5.4
p value			**<0.**01	**0.01**	0.12	**<0.01**
PostHoc			1>3. 2>3 (p<0.05)	3>1 (p<0.05)		3>1 (p<0.05)
Longest Lived Region	**n**	**%**				
Aegean	225	28.3	103.6±17.8	49.4±21.4	20.1±10.0	29.3±13.8
Marmara	210	26.4	107.4±14.8	44.7±15.9	18.2±6.4	26.5±11.7
Black Sea	36	4.5	106.7±17.8	55.1±31.9	25.5±19.4	29.5±14.9
Mediterranean	127	16.0	105.4±16.1	47.4±20.5	20.6±10.2	26.8±12.3
Central Anatolia	100	12.6	103.0±17.0	49.8±20.9	19.6±8.5	30.3±14.9
South Eastern Anatolia	70	8.8	100.4±20.2	61.2±31.1	25.8±17.4	35.4±16.7
Eastern Anatolia	27	3.4	104.5±19.3	52.3±26.5	22.6±13.9	29.7±14.9
F test			2.1	5.7	6.1	4.5
p value			0.05	**<0.01**	**<0.01**	**<0.01**
PostHoc			6>1 1>2. 3>2 6>2. 6>4 6>5 (p<0.05)	3>1 6>1 3>2 4>2. 6>2 7>2 3>4 6>4. 3>5 6>5 (p<0.05)	6>1 1>2 5>2 6>2 6>3. 6>4 6>5 (p<0.05)

Correlation analysis was used to examine the relationships between the dimensions that determine participants' perception of gender and their level of violence against women attitude. Negative r=-0.615 (p<0.001) correlation was found between violence against women total and gender perception total. The findings of the analysis are shown in Table 3.

Table 3. Correlation analysis of perception of gender and violence against women attitude scores

		Perception of Gender Total	Violence Against Women Attitude Total	Attitude Toward the Body	Attitude Toward the Identity
Perception of Gender Total	r	1.000			
	p	<0.001			
Violence Against Women Attitude Total	r	-0.615**	1.000		
	p	<0.001	<0.001		
Attitude Toward the Body	r	-0.346**	0.869**	1.000	
	p	<0.001	<0.001	<0.001	
Attitude Toward the Identity	r	-0.715**	0.920**	0.605**	1.000
	p	<0.001	<0.001	<0.001	<0.001

*<0.05; **<0.01; Pearson Correlation Analysis

The regression analysis performed to determine the relationship between the total perception of gender scale and the violence against women attitude scale was found to be significant (F=482.770; p<0.05). The total change in the level of the total score of the attitude toward violence against women is explained by the sum of gender perception at a rate of 37.8% (R^2=0.378). Perception of gender total score decreases the level of violence against women total score (ß=-0.799) (Table 4).

The regression analysis performed to determine the relationship between the total of perception of gender scale and attitude toward the body was found to be significant (F=108.059; p<0.05). The total change in the level of the total score of the attitude toward the body is explained by the sum of gender perception at a rate of 11.9% (R^2=0.119). Perception of gender total score decreases the level of the attitude toward the body (ß=-0.222) (Table 4).

Table 4. The Effect of Perception of Gender on Violence Against Women Attitude

Dependent Variable	Independent Variable	ß	t	p	Model (p)	R²
Violence Against Women Attitude Total	Invariant	132.981	34.468	<0.001	<0.001	0.378
	Perception of Gender Total	-0.799	-21.972	<0.001		
Attitude Toward the Body	Invariant	43.702	19.296	<0.001	<0.001	0.119
	Perception of Gender Total	-0.222	-10.395	<0.001		
Attitude Toward the Identity	Invariant	89.279	42.045	<0.001	<0.001	0.511
	Perception of Gender Total	-0.577	-28.834	<0.001		

DISCUSSION

Gender perception emerges as a driving force behind violence against women. Due to the patriarchal social structure, one of the most important reasons for violence against women is the existence of women in society outside of the roles expected of them. This study, which was conducted to determine gender perception and attitudes toward violence against women in Turkish society, as well as the relationship between them and the factors affecting them, shows that the participants' gender perception is positive. In a similarly conducted study, participants' perceptions of gender were found to be positive [15]. In a study conducted with university students, approximately three-quarters of the students

stated that there is an inequality between genders in Turkish society and that this inequality results from the structure of Turkish society [16].

In this study, educational and income status were found to influence people's perceptions of gender. The reason for the difference is that the total gender perception scores of those with good income status are higher than the total gender perception scores of those with low income status. In addition, the gender perception total scores of those with a university education level are higher than the scores of those with a primary school education level. According to a study, education level and income status are closely related to perceptions of gender roles [17].

Individuals' perception of gender equality improves as their educational and income levels rise, and this is especially true in low-income societies where gender perception is negative. Increasing the education level brings a contemporary perspective to individuals regarding the gender roles and becomes a determinant of gender equality. The educational consequences of gender inequalities are among the ongoing problems in all societies, to varying degrees and forms[18]. Education conveys gender-themed messages due to its functions, such as transferring culture and information to individuals, providing them with the necessary presuppositions to join the workforce, and so on. For this reason, schools, regardless of level, carry stereotypes and limitations about girls and boys, women and men. In a study conducted with individuals living in Turkiye, it is stated that factors such as gender, region of residence, education level, and employment status are among the determinants of perspectives on gender roles [17]. In a study on gender discrimination and violence against women in Lebanon, it was discovered that the participants' education level predicted their attitudes toward gender inequality [19].

In this study, while the gender perception score was lower in men than in women, the score against violence against women was found to be higher. In a study conducted with university students, it was stated that women's gender perception average scores were higher than men[20]. It is an expected finding that men's gender perception score is low in this study, and their opposition to violence against women was expected to be low. However, it seems that men are against violence against women. It is thought that public awareness and increased legal sanctions on this issue are effective due to the awareness studies carried out for the society about violence.

The cultural characteristics of societies are the most fundamental factors in gender perception. Generational cultural transmission is what keeps violence going down the generations. Violence is practiced differently in different cultures. It is important to understand the causes of violence and cultural differences when dealing with violence against women. The fact that cultural values are difficult to change means that the approach to violence against women and practices aimed at its prevention are critical, and violence must be addressed by all segments of society. Educating society about gender-based violence will be an important step toward a positive perception of gender in developing societies where patriarchal systems shape women's' experiences and choices in family relationships [21].

When the total score averages of the participants' violence against women attitude scale are examined, it is seen that the positive attitude towards women has increased. In addition, when their ISKEBE subscale scores are compared, it is observed that the average of attitudes toward identity, which includes psychological and economic violence, is higher than the average of attitudes toward the body, which includes physical and sexual violence. This situation demonstrates that while participants view psychological and economic violence (attitudes toward identity) as more unacceptable, they view physical and sexual violence (attitudes toward the body) as more acceptable. In the report prepared by the Ministry of Family and Social Policies (2014), it is stated that 36% of the women in Turkiye have been subjected to physical violence, and

12% have been subjected to sexual violence[8]. It has been detected that 44% of married women in Turkiye have experienced at least one form of emotional violence and abuse at some point in their lives [22]. According to the data from the 2011 Brazilian Women's Yearbook, 43.1% of women have been subjected to violence in their own homes, and among all women who have been attacked inside or outside the home, 25.9% of the perpetrators are their husbands or ex-husbands [23]. In a study conducted by Montgomery et al. in the United States, the prevalence of psychological, physical and sexual violence against women was found to be 31%, 19% and 7%. respectively [24]. In a study conducted with Libyan immigrants, it is stated that gender and education influence violence against women, and men typically do not see violence against women as a serious social problem, instead viewing it as a personal and family matter [25]. Violence against women harms women physically and psychologically; it prevents women from improving their social status; and it causes a significant number of women to be disadvantaged in terms of economic, social, educational, health and other rights. It is impossible to cultivate a sense of equality in a society, where women are subjected to violence.

There was a strong negative relationship between the total attitude towards violence against women and the total perception of gender. Affecting men's practice of physical violence against women in a study examining the factors, it is stated that gender attitude has an effect on physical violence against women[26]. In a study, it was stated that there was a strong negative relationship between the attitude of violence against women and the perception of gender[1]. It can be said that the perception of gender should change in

a positive way in order to decrease violence against women.

The regression analysis performed to determine the relationship between the total of perception of gender scale and violence against women attitude scale was found to be significant The total change in the level of total score of violence against women attitude is explained by the sum of gender perception at a rate of 37,8% Perception of gender total score decreases the level of violence against women total score. In this study, gender perception is the predictor of both the body and the identity of the violence against women attitude.

Limitations of the Study

The current findings are based on a cross-sectional data. This would imply that the extent to which the causal and temporal relationship between the dependent variable and predictors can be determined is severely limited. Secondly, the survey does not represent the entire of population in Turkiye. From this standpoint, the generalizability of the findings reported in this study is limited. Finally, it should be noted that this study evaluates Turkish society's attitudes rather than their behavioural intentions and actual behaviours.

CONCLUSION

The study revealed that the social and cultural characteristics of participants are associated with both the perception of gender and violence against women, despite there not being a reasonable correlation between the perception of gender and violence against women. There are substantial projects in various platforms around the world to reduce and prevent violence against women. Violence against women is a globally problem.

However, there is a need for more than one program that targets all segments of society to reduce and prevent violence against women. Governments must do their part to ensure that people live in a society that values gender equality. It is important to conduct ongoing awareness-raising activities as an important approach to addressing domestic violence issues affecting women. Planning and implementing comprehensive and continuous education that includes all people from all segments of society with the goal of positively influencing attitudes toward women will be an important step toward achieving a change in perception.

ACKNOWLEDGEMENTS

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ORIGINAL ARTICLE

Evaluation of differences in maternal and newborn health coverage across urban and rural areas: A pooled analysis of 88 countries

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Abstract

Objective: This study aims to determine whether the variables that reveal countries' maternal and newborn health coverage differ between rural and urban areas.

Methods: The sample of the study consists of 88 countries. The data were obtained from the "Maternal and Newborn Health Coverage Database 2022" published by UNICEF and analyzed using IBM SPSS Statistics. The T-test, Mann–Whitney U test and factorial ANOVA were used to analyze the data.

Results: The percentage of women who attended at least four prenatal appointments was found to be higher among women living in urban areas (81.1%) than among women living in rural areas (72.3%) (p=0.008). More cesarean sections are performed in urban (14.6%) than in rural areas (7.6%) (p=0.001). Women living in urban areas (94.3%) give birth in a health institution more frequently than women living in rural areas (81.3%) (p=0.001). The percentage of births attended by skilled health personnel was found to be higher for women living in urban areas (81.1%) than for women living in rural areas (72.3%) (p=0.001). The percentage of mothers (80.6%) who received postnatal care within 2 days of giving birth was also higher in urban areas than in rural areas (70.2%) (p=0.001). There is an interaction effect of urban-rural area and income group on the antenatal care 1+visit variable (p=0.001), institutional deliveries variable (p=0.023), and skilled birth attendant variable (p=0.002).

Conclusion: This research reveals that women and newborns living in rural areas are disadvantaged compared with those in urban areas with regard to antenatal, delivery, and postnatal care. It is recommended that steps are taken to reduce socioeconomic inequalities in rural areas, subsidize maternity services in hospitals, and develop a referral system among health institutions in rural areas.

Keywords: Access to Health Care, Delivery, Disparities, Antenatal Care, Postnatal Care

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INTRODUCTION

In the United Nations Sustainable Development Objectives, the target of objective 3.2 is "By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality and under 5 mortality."[1] It is important to draw attention to the difficulties faced by patients and health facilities in rural areas and to reduce maternal diseases and deaths in rural areas. These challenges include both clinical factors (lack of labor and low patient volume) and social determinants of health (transportation, housing, poverty, food safety, racism, and violence).[2] Obstacles to the use of services in rural areas can be listed as geographical distance, cost, lack of service, and insufficient personnel.[3]

The literature supports the concept that hospital care positively affects the health outcomes of infants. Some studies have shown that survival rates have increased for infants born in hospitals with appropriate resources.[4] It has been argued that infant and newborn deaths are closely linked to newborn care after birth, pregnancy care, delivery, place of birth, and quality of care.[5] Differences in infant and newborn deaths continue to depend on socio-demographic characteristics, such as race and ethnic origin and geographical location.

One of the driving forces of these differences is the differing access to delivery by risk. Appropriate services, services for the mother, the birth of the baby in a health institution, and serving the baby immediately after delivery can be listed as services with appropriate technology and staff.[6]

Many studies have investigated whether living in urban and rural areas is important in terms of mothers' deaths or access to health services. It has been argued that there is a large gap in terms of people's income and health status between urban and rural areas and that this gap explains the regional differences in the health status and survival rates of children between urban and rural areas.[7] In a study conducted in 54 countries, it was found that the coverage of births attended by skilled health personnel was the most unfair variable among the countries. The most fair intervention was determined as the early start of breastfeeding.[8] A study examining geographical and rural–urban differences in maternal mortality in China found that the risk of dying is higher in less developed regions due to a higher preventive maternal mortality rate and pregnancy.[9] In a US study, if sociodemographic and clinical conditions were checked, it was found that the possibility of maternal disease and death was 9 percent higher in rural than in urban areas.[2] A study conducted in Brazil found that rural women, regardless of their socioeconomic and pregnancy conditions, have a higher risk of giving birth to babies with a very low birth weight and detectable disabilities at birth than women living in urban areas of the same region.[10]

Understanding the coverage of maternal and neonatal health services between rural and urban populations is important for assessing the health needs of populations and addressing health disparities. This research can help policymakers to understand and take steps to close the urban–rural difference and to develop strategies to improve access to such health care. The aim of this study is to establish whether the variables that reveal the maternal and newborn health coverage in countries differ between rural and urban

areas.

METHODS

This research adopts a cross-sectional study design, which is a type of observational study design. The researcher evaluates both outcomes and exposures in the population, searching for potential associations in cross-sectional studies.[11]

The sample of the study consists of 88 countries that do not have missing values in the maternal and newborn health coverage data examined within the scope of the research (Additional File 1). The research was conducted on secondary data. UNICEF is a United Nations agency working in more than 190 countries and territories to protect the rights of all children, helping them to survive, develop, and fulfill their potential from early childhood to adolescence.[12] The data for the study were obtained from the "Maternal and Newborn Health Coverage Database 2022" published by UNICEF.[13] The data sources were national health surveys and national statistics published by official institutions of each country. Explanations of the variables used in the study are presented in Table 1.

Table 1. Variables Used in the Research

Categories	Variables	Explanation
Antenatal	Antenatal care 1+ visits	The percentage of women attended at least once during pregnancy by any provider.
Antenatal	Antenatal care 4+ visits	The percentage of women attended at least four times during pregnancy by any provider.
Delivery	C-section rate	The percentage of deliveries by C-section
Delivery	Institutional deliveries	The percentage of deliveries in a health facility.
Delivery	Skilled birth attendant	The percentage of deliveries attended by skilled health personnel.
Postnatal Newborn	Postnatal care for newborns	The percentage of newborns who received postnatal care within 2 days after birth.
Postnatal Mother	Postnatal care for mothers	The percentage of women who received postnatal care within 2 days after birth.

Source: UNICEF Maternal and Newborn Health Coverage Database 2022

The dataset used contains the most up-to date data for the countries. Therefore, data that do not belong to the same year across countries were employed (Table 2).

Table 2. The Year of the Variables

Variable	Year
Antenatal care 1+ visits	2012-2021
Antenatal care 4+ visits	2012-2021
Postnatal care for newborns	2010-2021
Postnatal care for mothers	2012-2021
C-section rate	2010-2021
Institutional deliveries	2012-2021
Skilled birth attendant	2012-2021

2010: Burundi, Bhutan 2012: Belarus, Barbadus, Gabon, Mexico, Ukraine 2013: Namibia, Yemen 2014: Egypti Cambodia, Sudan, El Salvador, Eswatini, VietNam 2015: Burkina Faso, Congo, Guaetemala, Panama, Solomon Islands, Chad 2016: Angola, Armenia, Belize, Côte d'Ivoire, Myanmar, Paraguay, Timor-Leste 2017: Haiti, Indonesia, India, Lao People's Democratic Republic, Maldives, Niger, Philippines, Democratic People's Republic of Korea, Togo, Tajikistan, Tanzania 2018: Afghanistan, Albania, Congo, Costa Rica, Guinea, Iraq, Jordan, Krgyzstan, Lesotho, Madagascar, Mali, Montenegro, Mongolia, Nigeria, Tunisia, Türkiye, Uganda 2019: Bangladesh, Central african Republic, Cuba, Dominican Republic, Algeria, Ethiopia, Ghana, Guinea-Bissau, Honduras, Kiribati, North Macedonia, Nepal, Pakistan, Senegal, Sierra Leone, Somalia, Sao Tome and Principe, Turkmenistan, Tonga, Zambia, Zimbabwe 2020: Gambia, Guyana, Kenya, Liberia, Malawi, State of Palestine, Kosowo, Rwanda, Tuvalu, Samoa 2021: India, Niger

Within the scope of the study, 88 countries out of 186 countries, which were not missing data for the variables examined, were included. The data were analyzed with IBM SPSS Statistics (IBM SPSS Statistics for Windows, Version 26.0. Armonk, United States). The normal distribution assumption was tested with the Kolmogorov–Smirnov, skewness, and kurtosis values. In the analysis of the data, the significance test (t-test) of the difference between the two means and the Mann–Whitney U test were used. Factorial ANOVA was used to test the interaction effect of countries' income groups and countries' rural-urban data. The significance level was set as $p<0.05$. The research data are reported using the mean and median values, standard deviation, and interquartile range of prevalence measures.

For this research, the income group of 88 countries was obtained from the World Bank's website for 2022. The World Bank categorizes global economies into four income groups, namely low, lower-middle, upper-middle, and high income. The categorizations rely on the gross national income (GNI) per capita from the preceding year.[14]

The question to be answered by this research was determined as follows:

Do the variables of antenatal care, delivery, and postnatal care coverage differ between rural and urban regions?

RESULTS

The distribution of prenatal, postnatal care, and delivery coverage in urban and rural regions of the examined countries is presented in Table 3.

Table 3. Antenatal, Postnatal and Delivery Coverage Variables by Urban and Rural Areas

	Rural			Urban			p-value
	X̄±Sd	Med	IQR*	X̄±Sd	Med	IQR	
Antenatal							
Antenatal care 1+ visits	88.4±14	94.55	13.9	94.5±6.9	96.5	5.7	0.003[a]
Antenatal care 4+ visits	67.3±21.6	72.3	36	76.4±16	81.1	23	0.008[a]
Postnatal							
Postnatal care for newborns	66.21±30.6	66.2	30	74.9±26.3	74.9	24	0.015[b]
Postnatal care for mothers	70.25±24.7	70.2	28	80.6±17.3	80.6	21.9	0.001[b]
Delivery							
C-section rate	13.5±12.9	7.6	19.2	19.9±14.3	14.6	20.7	0.001[a]
Institutional deliveries	75.1±24.4	81.3	37.9	89.4±13.5	94.3	11.6	0.001[a]
Skilled birth attendant	77.7±22.9	86.4	36.7	92.11±9.9	96	9.6	0.001[a]

* IQR: Interquartile range
[a] p value was obtained by the Mann Whitney U test.
[b] p value was obtained using an independent two-sample t-test.

It was determined that there are significant differences between antenatal, delivery and postnatal coverage in urban and rural areas. Women and infants benefit from services at higher antenatal, delivery and postnatal in urban areas than in rural areas. In urban areas, women receive more services from health

personnel before and after birth. Additionally, the average of women giving birth in health institutions is significantly higher in urban areas than in rural areas ($p=0.001$). C-section rates are also significantly higher in urban areas ($p=0.001$). These differences were determined to be statistically significant.

Table 4. Factorial ANOVA Test Results for Antenatal, Postnatal and Delivery Coverage Variables of Countries by Urban-Rural and Income Groups

	df	Mean Square	p	η2
Antenatal care 1+visit				
Urban-Rural	5	1043	0.001	0.086
Income groups	5	1043	0.001	0.140
Urban-Rural*Income groups	5	1043	0.001	0.036
Error	170	105.6		R²=0.202
Antenatal care 4+visit				
Urban-Rural	1	3190	0.001	0.076
Income groups	2	11863	0.001	0.378
Urban-Rural*Income groups	2	279	0.298	0.014
Error	170	229		R²=0.400
Postnatal care for mothers				
Urban-Rural	1	4588	0.001	0.071
Income groups	2	8834	0.001	0.226
Urban-Rural*Income groups	2	691	0.146	0.022
Error	170	355		R²=0.262
Postnatal care for newborns				
Urban-Rural	1	3195	0.035	0.026
Income groups	2	10212	0.001	0.145
Urban-Rural*Income groups	2	447	0.534	0.007
Error	170	710		R²=0.145
Institutional deliveries				
Urban-Rural	1	8542	0.001	0.146
Income groups	2	7670	0.001	0.234
Urban-Rural*Income groups	2	1132	0.023	0.043
Error	170	294		R²=0.327
C-section rate				
Urban-Rural	1	1663	0.001	0.075
Income groups	2	5901	0.001	0.365
Urban-Rural*Income groups	2	12	0.905	0.001
Error	170	121		R²=0.381
Skilled birth attendant				
Urban-Rural	1	8602	0.001	0.183
Income groups	2	6153	0.001	0.242
Urban-Rural*Income groups	2	1527	0.002	0.073
Error	168	229		R²=0.368

[a] p value was obtained by the Factorial ANOVA.

Countries' antenatal, delivery and postnatal coverage variables differ according to income groups. There is an interaction effect of urban-rural area and income group on the antenatal care 1+visit variable (p=0.001), institutional deliveries variable (p=0.023), and skilled birth attendant variable (p=0.002). The effect size of income groups in antenatal care visit and C-section rate variables is larger than other variables. It was determined that the income group variable had a

large effect size on the antenatal care 4+visit ($\eta 2=$ 0.378) and C-section ($\eta 2= 0.365$).

DISCUSSION

This research reports regional disparities between urban and rural areas in maternal and neonatal health coverage using maternal and neonatal health coverage data from 88 countries. In this study, it was found that the percentage of women who were attended at least once during pregnancy by skilled health personnel was higher in urban than in rural areas. The percentage of women who attended at least four antenatal services was found to be higher in urban areas than in rural areas. In addition, it was observed that the interaction effect of urban-rural area and income group on the skilled birth attendant variable. Partridge et al. (2012) stated that the risk of prematurity, stillbirth, early and late neonatal death, and infant death increases as antenatal care decreases.[15] A study conducted in China found that there is a disparity between rural and urban areas in terms of antenatal care, health facilities for birth, and health professional services at birth. It reported that mothers from high wealth index households were more likely to live in urban areas, use maternal health services, and have higher education and greater media exposure than mothers living in rural areas.[9] Margaret et al. (2013) suggested that health care workers in urban areas demonstrated better knowledge and practice than their rural counterparts. According to research, urban areas generally have better equipment, materials, and training than rural areas. The availability of specialized and higher-tenured personnel is greater in urban areas.[16] A study performed in Northern Ghana found the main factors explaining the relatively high skilled birth coverage in urban areas to be higher frequency of attendance at antenatal care (ANC), proximity to a health facility (physical access), and a larger proportion of women achieving higher levels of education.[17]

A study conducted in Iran suggested that low cost, lack of health insurance, and socio-cultural and familial reasons cause mothers to hesitate to give birth at home and seek professional emergency care for birth complications.[18] In this study, the percentage of newborns and mothers who had postnatal contact with a health provider within 2 days of delivery was found to be statistically significantly higher in urban areas than in rural areas. It has been noted that babies who die within the first 28 days after birth suffer from a lack of quality service at birth or a lack of quality service and treatment immediately after birth and in the first days of life.[19] The density of human resources for health was found to affect indicators such as the maternal mortality rate, infant mortality rate, and under-five mortality rate.[20] It has been stated that there are policies that encourage health workers from poor countries to migrate to developed countries.[21] Besides, it has been argued that geographic accessibility to health facilities is an obstacle to the use of maternal and neonatal health (MNH) services.[22] In a study conducted in Malawi, pregnancy complications, women's lower education levels, difficulties accessing the available health facilities, and low exposure to media were significantly associated with a delay in women's use of postpartum care services within 24 hours of birth in rural Malawi.[23]

In this study, it was determined that women living in urban areas gave birth in a health institution more frequently than women living in rural areas. There are interaction effects between urban and rural areas and income groups on important variables such as prenatal care, institutional birth, and skilled birth attendant. It has been stated that, due to the poor socioeconomic status of rural women, most of them cannot afford to travel to places where they can obtain help from health professionals while giving birth. Although births are mostly free in rural health institutions, the facts that these health facilities are not within easy reach of rural women and that most women cannot afford the transportation cost may cause them to choose to give birth at home.[24] Understanding the

barriers to rural women's access to maternity services will be an important step.

In this study, it was found that the c-section rate is higher among urban women than among rural women. In different studies on access to cesarean sections, being able to receive cesarean section services has been particularly associated with income. Ushie et al. (2019) found that belonging to the poorest quintile and not receiving formal education were associated with a lower probability of having a cesarean delivery.[25] Leone et al. (2008) analyzed the institutional, socioeconomic, and societal factors affecting cesarean sections in six countries and concluded that women from higher socioeconomic backgrounds with better access to antenatal services were more likely to have a cesarean section.[26] The lowest cesarean rates were found in the more distant part of the hospital service area in Rwanda.[27] A study conducted in Indonesia found that the rate of cesarean sections in urban areas was almost double that in rural areas in 2017. This ratio was almost three times higher in the richest quintile than in the poorest quintile.[28] The probability of having a cesarean section was found to be higher in urban areas of Mozambique and Pakistan.[29–30] Achieving equity in healthcare will require the service to be available to those who need it rather than just those who can pay.

According to the research findings, women living in urban areas give birth in a health institution more frequently than women living in rural areas. Hernández-Vásquez et al. (2021), in their meta-analysis, found that the women in the richest quintile had the lowest percentage of home births, while the poorest had the highest percentage of home births. They reported that it was more common for uneducated women to give birth at home in general and that, in almost all countries, rural women generally had a higher home birth rate than those in urban areas.[31] In addition, most neonatal deaths occur at home.[24]

Limitations

This research is limited to 88 countries with urban- and rural-specific data in the UNICEF Maternal and Newborn Health Coverage Database 2022. Although the most up-to date data were used, not all of the analyzed data belong to the same year. Different results might be obtained for countries that were not included in the analysis. For this reason, the income characteristics of the countries that were not included in the analysis were evaluated (countries with complete data: low income=24; lower-middle income=38; upper-middle and high income=26; countries with incomplete data: low income=6; lower-middle income=18; upper-middle income=31; high income=46). When the countries with extracted data were excluded from the analysis, a more balanced distribution was achieved by combining the upper-middle and high-income groups.

Strengths

The strength of this research is that it analyzes the coverage of maternal and child health in rural and urban areas as well as taking into account the income group to which the countries belong.

CONCLUSION

This research reveals that women and newborns living in rural areas are disadvantaged compared with those living in urban areas with regard to antenatal, delivery, and postnatal care. There is a significant difference between rural and urban areas in terms of deliveries and receiving care from health professionals. It appears that more efforts are needed to make these services accessible. Interaction effect of urban-rural area and income group was found on the variable of antenatal care, delivery and skilled birth attendant. This means that the high-income group in an urban area tend to benefit more from prenatal care services, while this may differ for the low-income group in a

rural area. This suggests that, in addition to inequality in urban and rural areas, being socioeconomically disadvantaged increases this inequality.

These differences in urban and rural areas conflict with the sustainable development goals that seek to reduce health inequalities. Although there is not much difference between women living in rural and urban areas in terms of receiving care from skilled health personnel at least once during pregnancy, the difference widens as the frequency of receiving care increases. Unfortunately, in both rural and urban areas, it is possible that skilled health personnel do not attend births. It may be beneficial to make interventions for health workforce retention in rural areas.

This study recommends raising awareness through campaigns on maternal health, especially for women of childbearing age who live in rural areas, to determine self-awareness of the complications of pregnancy, to develop health information-seeking behaviors and skills, and to achieve these through accessible channels. Steps can be taken to reduce the socioeconomic inequalities between rural and urban areas. It can be beneficial to increase the skills of health professionals during birth, to set minimum targets for access to antenatal and postnatal care, to subsidize maternity services in hospitals, and to develop a referral system among health institutions in rural areas.

ACKNOWLEDGEMENTS

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Additional File 1. Countries Included in the Research

Nu.	Countries	Nu.	Countries
1	Afghanistan	45	Mexico
2	Angola	46	North Macedonia
3	Albania	47	Mali
4	Armenia	48	Myanmar
5	Burundi	49	Montenegro
6	Benin	50	Mongolia
7	Burkina Faso	51	Malawi
8	Bangladesh	52	Namibia
9	Belarus	53	Niger
10	Belize	54	Nigeria
11	Barbados	55	Nepal
12	Bhutan	56	Pakistan
13	Central African Republic	57	Panama
14	Côte d'Ivoire	58	Philippines
15	Democratic Republic of the Congo	59	Democratic People's Republic of Korea
16	Congo	60	Paraguay
17	Costa Rica	61	State of Palestine
18	Cuba	62	Kosovo
19	Dominican Republic	63	Rwanda
20	Algeria	64	Sudan
21	Egypt	65	Senegal
22	Ethiopia	66	Solomon Islands
23	Gabon	67	Sierra Leone
24	Ghana	68	El Salvador
25	Guinea	69	Somalia
26	Gambia	70	Sao Tome and Principe
27	Guinea-Bissau	71	Eswatini
28	Guatemala	72	Chad
29	Guyana	73	Togo
30	Honduras	74	Tajikistan
31	Haiti	75	Turkmenistan
32	Indonesia	76	Timor-Leste
33	India	77	Tonga
34	Iraq	78	Tunisia
35	Jordan	79	Türkiye
36	Kenya	80	Tuvalu
37	Kyrgyzstan	81	United Republic of Tanzania
38	Cambodia	82	Uganda
39	Kiribati	83	Ukraine
40	Lao People's Democratic Republic	84	Viet Nam
41	Liberia	85	Samoa
42	Lesotho	86	Yemen
43	Madagascar	87	Zambia
44	Maldives	88	Zimbabwe

ORIGINAL ARTICLE

Peer bullying in adolescents and related factors

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Abstract

Objective: This study aims to determine the frequency of peer bullying and being exposed to bullying in adolescents and the factors associated with these behaviors.

Methods: This cross-sectional study was carried out in a high school between February 2016 and November 2017. The study population was 203students. The 2013-2014 version of the questionnaire form (HBSCQ) used in the Health Behavior in School-aged Children study of the World Health Organization was used as the measurement tool. Chi-square, Fisher's Exact Test, Mann-Whitney U test were used in univariate analyses. Logistic regression analysis was used to show the effect of social support to bullying.

Results: The frequency of being exposed to peer bullying was 19.8%, and performing bullying was 23.7%.Being exposed to peer bullying was observed with a higher rate in those who migrated from another city (p=0.031). The average peer support score (p=0.001), family support score (p=0.039), and family communication score (p=0.028) were significantly lower in those who were exposed to bullying. The behavior of bullying was observed with a significantly higher rate in those with fewer siblings (p=0.028), had negative opinions about the school (p=0.024) and involved in a physical fight (p=0.001). According to the logistic regression analysis results, family support score was found to be protective against exposure to bullying. The protective effect of family communication and peer support scores continued to be significant after the adjustment.

Conclusion: The results of this study highlight the efficiency of social support in addressing and mitigating the effects of bullying among adolescents. School health programs should involve collaboration between teachers, administrators, parents, and students to create a unified approach to tackling bullying.

Keywords: Adolescent, Peer Bullying, School Health, Social Support

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INTRODUCTION

Bullying is one of the common violent behaviors among school children. According to the data of the WHO Global Status Report on Preventing Violence Against Children in 2020, one in every three students in the age group of 11-15 is exposed to bullying.[1] Olweus proposed the most commonly used definition of bullying. According to this definition, bullying is referred to as situations in which an individual is exposed to repetitive negative actions by one or more people and cannot defend themselves due to the physical and psychological power imbalance.[2] Bullying can occur in the school environment, social environment, or on the internet. It may cause physical, psychological, and social harm and it may also have adverse effects on education.[3] The main types of bullying are; physical, verbal, relational, and property damage.[3] Physical bullying is bullying with acts of violence such as hitting, kicking, punching, spitting, and pushing. In verbal bullying, there are acts such as mocking, nicknaming, delivering offensive written notes, hand gestures, swearing, sexual discourse, and threatening. In the type of bullying that targets the young person's relationships, there are behaviors such as isolating the person from their friends, preventing them from establishing relationships with others, spreading false and harmful statements, making derogatory comments, spreading embarrassing images without the permission of the person. The type of bullying by damaging property includes stealing, damaging, seizing, refusing to return one's property, and deleting personal electronic information.[3] Children exposed to bullying face a wide variety of risks, including psychiatric problems such as depression, anxiety, suicide attempts, social weakness, school failure, dropout, low school attendance, substance abuse, and other violent behaviors. Most of these effects are acute; however, some may persist into late adolescence or even adulthood. Physical fighting and bullying are also associated with other risky behaviors such as smoking, alcohol abuse, and getting involved in crime.[4] This study aims to determine the frequency of peer bullying and exposure in adolescents and the factors associated with these behaviors.

METHODS

This cross-sectional study was carried out in İzmir Güzelbahçe İMKB Vocational and Technical Anatolian High School between February 2016 and November 2017. Sample size was not calculated. All the ninth and tenth-grade students who attended the school in November 2016 were included in the study. The study group was 251 ninth and tenth-grade students enrolled in this high school in the 2016-2017 academic year. Eleven and twelfth-grades were excluded from the assessment because they were trained in workshops outside of the school or were out of the school due to their internships. The 2013-2014 version of the questionnaire form (HBSCQ) used in the Health Behavior in School-aged Children study of the World Health Organization was used as the measurement tool. The specific population targeted for sampling is young people attending school aged 11-15 years in the HBSC study. There are 74 questions under 14 subtitles in the HBSC questionnaire.[5] The subheadings used in this study; demographic characteristics, risky behaviors, violence and injury, family relations, peer relations, health and well-being, school life, and social

inequalities. The study protocol was used for all measurements. [5] The students filled the questionnaire themselves in their classrooms. The dependent variables are exposure to peer bullying, performing peer bullying; whereas the independent variables are gender, age, parental education status, parental employment status, income perception, family welfare score (0-3 point low, 4-5 points average, 6-7 points high family welfare as the HBSC study protocol), family structure, the number of people living in the family, the number of siblings, the place of residence, immigration from one city to another , subjective health index, tobacco use, physical fight, school life-related variables (opinions about school, the pressure created by the coursework, opinions about school success), and variables related to social support (peer support, family support, communication with family). The variables were investigated using visual (histograms, probability plots) and analytical methods (Kolmogorov-Smirnov) to determine whether or not they are normally distributed. Descriptive findings were presented using percentage distributions for categorical variables; medians (1.-3. quartiles) for non-normally distributed variables and mean ± standard deviation (min-max) for normally distributed continuous variables. Chi-square, Fisher's Exact Test, Mann-Whitney U test were used in univariate analyses and logistic regression analysis was used in multivariate analyses. In the logistic regression analysis, how the dependent variables are affected by social support scores is presented both with the unadjusted model and adjusted for sociodemographic variables. The significance level was accepted as *p*<0.05. Ethics committee approval was obtained from Dokuz Eylul University Clinical Research

Ethics Committee on 05.05.2016 with the decision number of 2016/08-07. Informed consent was obtained from both parents and participants. To apply the questionnaires to the students, institutional permission was obtained from the Provincial Directorate of National Education of the Governorship of İzmir, on 28.09.2016 with the permission number 12018877-604.01.02-E.10432745.

RESULTS

203 students participated in the study (response rate: 80.9%). The average age was 15.5 ± 0.8 (14-17), 86.9% of the students were males and 13.1% were females. The class distribution was as following: 54.5% were ninth-graders and 45.5% were tenth-graders. 65.2% of the mothers and 64.4% of the fathers had secondary school level or lower education level. 68.5% of mothers and 6.3% of fathers either did not working at all or were worked in daily jobs with irregular incomes. It was determined that 6.0% of the students evaluated their economic situation as very bad/bad. 11.9% of the students did not have a private room belonged to them, 17.4% did not have a laptop/computer, 41.3% did not have a family-owned car, etc., and 19.0% did not have a dishwasher in the household. 22.5% of the students stated that they did not have a vacation over the past year. The average family welfare score, which was calculated using these variables in determining the family's economic status, was 4.7 ± 1.7 (0-7). Accordingly, 23.6% of the students had low family welfare. While 93.8% of the students had a nuclear family structure consisting of mothers, fathers and siblings, 6.2% had an extended family structure. The median total number of persons living in the family was 4.0 (4-5). The median number of siblings,

excluding the students themselves, was 1.0 (1-2).The distribution of students according to their place of residence was as follows:

21.8% of students lived in rural areas while 19.9% had moved from another city in the last five years.

When examining some health complaints that the students stated that they had experienced in the last six months, 25.5% had back pain, 23.6% had headaches, 22.0% had difficulties while falling asleep, 14.9% had stomach pain, 13.8% suffered from dizziness once a week or more frequently. 33.4% of the students reported feeling sad, while 48.3% felt angry once a week or more. The average subjective health index score calculated according to the frequency of these complaints was 28.9 ± 5.7 (12.0-35.0).

29.5% of the students in the research samples had a negative opinion of the school. The proportion of the students who felt more or less pressured by courses and assignments was 83.4%. 46.5% of the students responded medium/low when asked to rate their success at school compared to their classmates.

14.6% of the students used tobacco and tobacco products at least once every day. The average age of students' first exposure to tobacco products such as cigarettes and hookahs was 13.0 ± 1.8 (7-17). The frequency of students getting involved in a physical fight in the last 1 year was found to be 58.9%.

17.9% of the students stated that it was difficult/very difficult to talk to their mothers, and 26.9% stated that it was difficult/very difficult to talk to their fathers. Approximately 80% of the students stated a positive opinion about their communication with their families. The average family communication score

calculated using those propositions was 4.3 ± 0.8 (1-5). Approximately 80% of the students expressed a positive opinion regarding the propositions about the support they received from their families. The mean family support score calculated using these items was 4.3 ± 0.9 (1-5). Approximately 70% of the students stated positive opinions regarding the propositions about their friends. The mean peer support score calculated using these items was 4.1 ± 0.9 (1-5).

The frequency of being exposed to peer bullying at least once in the last two months was 19.8%, and the frequency of performing bullying was 23.7%. Characteristics of the study group by bullying was presented in Table1. In the past five years, 32.4% of those who migrated from another city to their current settlement and 16.7% of the locals stated that they were exposed to peer bullying at least once in the last two months. The difference between immigrants and natives was statistically significant (*p*=0.031). Gender, age, parental education status, parental employment status, number of siblings, number of family members, place of residence, income perception, family welfare score did not affect exposure to bullying (Table 1).

28.9% of those with one sibling or less and 15.1% of those with two or more siblings had bullied a peer in the previous two months. The prevalence of bullying behavior was significantly higher among those with fewer siblings (*p*=0.028). Performing bullying was observed more often in those with a family of four or less than those with a larger family (*p*=0.004). Gender, age, parental education status, parental employment status, place of residence, immigration, income perception, family welfare score did not affect bullying (Table 1).

Table 1. Being exposed to bullying and performing bullying according to the sociodemographic characteristics

Characteristics	Being Exposed to Bullying					Performing Bullying				
	Yes		No		*p*	Yes		No		*p*
	n	%	n	%		n	%	n	%	
Gender										
Male	35	21.0	132	79.0	0.374*	43	24.3	134	75.7	0.788*
Female	2	10.0	18	90.0		4	19.0	17	81.0	
Education level of mother										
Middle school and below	17	14.8	98	85.2	0.066	29	23.4	95	76.6	0.852
High school and above	18	25.7	52	74.3		16	22.2	56	77.8	
Education level of father										
Middle school and below	25	21.6	91	78.4	0.656	27	21.8	97	78.2	0.573
High school and above	12	18.8	52	81.3		17	25.4	50	74.6	
Employment status of mother										
Working	14	24.6	43	75.4	0.325	15	25.4	44	74.6	0.627
Not working	23	18.3	103	81.7		30	22.2	105	77.8	
Employment status of father										
Working	34	20.6	131	79.4	1.000*	39	22.4	135	77.6	1.000*
Not working	2	15.4	11	84.6		3	23.1	10	76.9	
Number of siblings										
At most 1	26	22.6	89	77.4	0.179	35	28.9	86	71.1	**0.028**
2 and above	10	14.5	59	85.5		11	15.1	62	84.9	
Number of the people in the family										
At most 4	24	21.6	87	78.4	0.327	36	30.8	81	69.2	**0.004**
5 and above	11	15.7	59	84.3		9	12.50	63	87.5	
The present place of residence										
Urban	31	21.7	112	78.3	0.321	34	22.5	117	77.5	0.297
Rural	6	14.6	35	85.4		13	30.2	30	69.8	
Migration										
Yes	12	32.4	25	67.6	**0.031**	12	30.8	27	69.2	0.249
No	25	16.7	125	83.3		35	22.0	124	78.0	
Perception of income										
Very good-Good-Average	32	18.5	141	81.5	0.701*	42	22.8	142	77.2	0.481*
Bad-Very bad	3	25.6	9	27.0)		4	33.3	8	66.7	
Family welfare score										
High	7	21.2	26	78.8	0.937	9	25.0	27	75.0	0.985
Average	22	20.4	86	79.6		27	23.9	86	76.1	
Low	8	18.2	36	81.8		11	23.4	36	76.6	

*Fisher's Exact Test

No significant relationship was found between views about school, the pressure of coursework, perception of school success, everyday tobacco use, and involvement in physical fighting in the last year and being bullied (Table 2).

Those who had negative opinions about the school performed more bullying than those who did not have negative opinions about the school (*p* =0.024).Those involved in a physical fight in the last year performed more bullying than those who did not involve in a physical fight in the last year (*p*=0.001). No significant relationship was found between the pressure of coursework, perception of school achievement, daily tobacco use and bullying (Table 2).

Table 2. Being exposed to bullying and performing bullying according to views about school life, tobacco use and physical fighting.

Characteristics	Being Exposed to Bullying					Performing Bullying				
	Yes		No		*p*	Yes		No		*p*
	n	%	n	%		n	%	n	%	
Views about the school										
I like/dislike a lot	23	17.0	112	83.0	0.112	27	19.4	112	80.6	**0.024**
I do not like it very much/at all	14	27.5	37	72.5	-	20	34.5	38	65.5	
Pressure of coursework										
None/Light/Some	27	20.0	108	80.0	1.000	29	20.4	113	79.6	0.059
Heavy	10	20.0	40	80.0		18	33.3	36	66.7	
Perception of school success										
Very good-good	17	17.2	82	82.8	0.337	21	20.2	83	79.8	0.285
Average	14	20.0	56	80.0		19	25.3	56	74.7	
Low	5	33.3	10	66.7		6	37.5	10	62.5	
Everyday tobacco use										
Yes	6	21.4	22	78.6	0.763	11	37.9	18	62.1	0.059
No	30	19.0	128	81.0		36	21.7	130	8.3	
Physical fighting										
Yes	26	24.3	81	75.7	0.095	37	33.3	74	66.7	**0.001**
No	11	14.3	66	85.7		10	12.7	69	87.3	

The average peer support score, family support score, and family communication score were significantly lower in those who were exposed to bullying (*p*=0.001, *p*=0.039, *p*=0.028, respectively). No significant relationship was found between subjective health index and exposure to bullying (Table 3).

No significant relationship was found between subjective health index, peer support score, family support score, family communication score and bullying in the last two months (Table 3).

Table 3. Subjective health index and social support scores according to exposure to bullying and performing bullying (Median (1.-3. quartiles).

	Being Exposed to Bullying		p*	Performing Bullying		p*
	Yes	**No**		**Yes**	**No**	
	Median (1.-3. quartiles)	Median (1.-3. quartiles)		Median (1.-3. quartiles)	Median (1.-3. quartiles)	
Subjective health index	28.0 (27.0-31.0)	31.0 (25.0–34.5)	0.064	29.0 (25.0-32.0)	31 (25.8-34.0)	0.133
Peer support score	4.0 (3.0-4.3)	4.3 (3.8-5.0)	**0.001**	4.3 (3.8-5.0)	4.0 (3.6-4.8)	0.567
Family support score	4.5 (3.4-4.9)	4.8 (4.0-5.0)	**0.039**	4.5 (3.7-5.0)	4.8 (4.0-5.0)	0.593
Family communication score	4.3 (3.3-4.8)	4.8 (4.0-5.0)	**0.028**	4.5 (3.8-5.0)	4.5 (4.0-5.0)	0.693

* Mann-Whitney U test

The logistic regression analysis results, which show the effect of peer support score, family support score, and family communication score by correcting the effect of sociodemographic variables, are presented in Table 4.

Family support score was found to be protective against exposure to bullying after being adjusted for sociodemographic variables (OR: 0.60, 95% CI: 0.363-0.974). The protective effect of family communication and peer support scores continued to be significant after the adjustment (Table 4).

Family communication score, family support score, peer support score did not significantly affect performing bullying in the last two months, neither in corrected nor in unadjusted models as demonstrated in Table 4.

Table 4. Association between social support scores and being exposed to bullying and performing bullying, OR, 95% CI

Characteristics	Being Exposed to Bullying				Performing Bullying			
	Crude OR (95 %CI)	**P**	**Adj. OR* (95% CI)**	**p**	**Crude OR (95% CI)**	**p**	**Adj. OR* (95% CI)**	**p**
Family Communication Score	0.66 (0.432-0.994)	**0.047**	0.44 (0.246-0.771)	**0.004**	0.93 (0.627-1.392)	0.738	0.94 (0.534-1.638)	0.935
Family Support Score	0.77 (0.532-1.102)	0.151	0.60 (0.363-0.974)	**0.039**	0.90 (0.640-1.275)	0.563	0.90 (0.547-1.479)	0.677
Peer Support Score	0.54 (0.363-0.789)	**0.002**	0.50 (0.314-0.787)	**0.003**	1.20 (0.814-1.777)	0.355	0.71 (0.174-2.882)	0.201

* Adjusted according to age, gender, parental education status, employment status of parents, number of siblings, number of people living in the family, place of residence, migration, family welfare score.

DISCUSSION

In this study, 19.8% of the students have been exposed to bullying in the last two months. According to HSBC Türkiye's results in 2006, 65.2% of students stated they were bullied in the last two months.[6] In a study conducted with middle school students in Izmir, exposure to bullying was 42.3%.[7] In the present study, exposure to bullying is very low compared to other studies. This may be because the study group was older than other studies and the study was conducted in only one school.

In 42 countries where the HBSC protocol in 2013-2014 was followed, the frequency

of being exposed to bullying in the last two months specific to the age of 15was found to be 23%. There were significant differences (49% -6%) between countries regarding the frequency of being exposed to bullying. The countries with the highest rate of being bullied were Lithuania (49%), Latvia (41%), Belgium (40%). The countries with the lowest rate of being bullied were Italy (8%), Iceland (8%), and Armenia (6%).[8] In the 2017-2018 follow-up of the same study, the frequency of being bullied at least two times in the last two months was 8%, and it was stated that there was no significant change compared to the follow-up conducted four years ago.[9] According to the 2019 results of the Youth Risk Behavior Survey (YRBS) in the USA, 19.5% of high school students had been exposed to peer bullying in the last twelve months. There was no significant change in that frequency in the last ten years.[10] Our study has similar findings to the studies in Europe and the ones in the USA.

In this study, those who immigrated from another city to their place of residence in the last five years were exposed to more bullying. The relationship between migration and health behaviors in ninth to twelfth graders was observed in five regions in the USA's YRBS cohort. No relationship was found between migrating to a place in the last six years and being bullied. In one of the five regions, migrating to a place more than six years ago increased the exposure to bullying 1.7 (1.2-2.6) times.[11] This finding may be due to cultural differences between countries. Detailed information such as where the immigrant students came from and the reason of their migration was not questioned in that study. Therefore, it was not possible to fully explain the relationship between migration

and bullying.

No relationship was found between other sociodemographic variables and exposure to bullying. Although there are studies in the literature with similar findings to the present study where there is no difference in terms of gender[7, 12, 13], there are also studies that report more exposure to bullying in men[14, 15, 16], besides the studies that report more exposure to bullying in women.[17] In the international HBSC 2013-2014 study, in line with our study, no gender difference was found in most countries.[8] In the literature, the rate of exposure to bullying usually decreases with age.[6, 8, 18] Similar to our study, in a study conducted in Izmir, no significant relationship was found between age and exposure to bullying.[12] In the studies of Açıkgöz and Başaran, no significant relationship was found between exposure to bullying and parental educational status, which is similar to our study.[16, 17] In the study of Mercan and Sarı, no significant relationship was found between being bullied and the father's educational status while the rate of being bullied was found higher in those with mothers who had a high level of education.[12] In some studies, exposure to bullying was observed more frequently in students with parents who had a lower level of education.[7, 18] In the literature, generally, there was no difference in terms of income, in line with this study.[7, 12, 17, 18] However, in Açıkgöz's study, those with low income were exposed to bullying lower than those with higher income.[16] This study is similar to the literature regarding the employment status of parents, family structure, and the number of people living at home.[12, 17] Although there was no significant relationship with the number of siblings in the present study, there are studies that suggest a higher rate of being bullied in

students with no siblings[16] and those with a higher number of siblings.[17] Since the study was conducted in a single school and the study group was homogenous, it may not have been able to reveal the relationship between bullying end sociodemographic variables.

School-related variables did not affect exposure to bullying in this study. Studies conducted in Izmir and Sakarya support our findings.[7, 16] In the Research with East London Adolescents: Community Health Survey (RELACHS) study conducted with 2790 adolescents aged between 11-14 in England, it was stated that being successful in school was protective against bullying.[19] The difference in the measurement method may have caused this difference.

When the variables related to social support were examined, family communication, family support, and peer support scores were found to be protective against exposure to bullying when corrected according to sociodemographic variables in multivariate analysis. There are various results in the literature on this subject. In a school study conducted with 13,633 tenth-grade students in Norway, where the relationship between social support and exposure to bullying was examined, high family support was found to be protective against bullying while peer support did not significantly affect exposure to bullying.[20] In the Izmir study, similar to our study, exposure to bullying was found 1.8 times more in those with low peer support.[7] Again, in Ünal's study, exposure to bullying was reported as high in people who had unhealthy communication within the family.[21] According to the results of the RELACHS research, high peer support was protective against being bullied. No significant relationship was found

between family support and being bullied.[19] In line with all these findings, it can be concluded that social support affects bullying behavior in adolescents in various ways. This effect may have different dimensions in different research groups.

In this study, the frequency of bullying is 23.7%. In the HBSC Türkiye study, the frequency of the bullying was found to be 40.7%.[6] Accordingly, it can be affirmed that the rate of bullying in our sample is lower than Türkiye's overall rate. In a study conducted with middle school students in Izmir, the frequency of bullying was 20.3%, similar to our study.[7]

According to the results of International HBSC 2013-2014, the frequency of bullying was 26%. There were also significant differences between countries in terms of the frequency of bullying. The countries with the highest rates of bullying were Latvia (55%), Lithuania (52%), and Ukraine (45%). The countries with the lowest rates of bullying were Iceland (11%), Armenia (10%), and Sweden (8%).[27] In the HBSC 2017-2018 follow-up, the rates of bullying were reported to be at similar levels with the previous follow-up.[9]

In some studies, the act of bullying was more common in males than females.[6, 8, 14, 15, 16, 21] Similar to our study, there was no difference in gender, as reported in Çelenk and Başaran.[13, 17] Some studies suggested that bullying gradually decreased with age.[6, 8] However, the studies of Mercan and Ünal were similar to the present study.[12, 21] In the Izmir study, it was reported that bullying was more frequent among people whose mothers had low educational status.[7] In Başaran's study, it was found that bullying was higher among those who had working mothers.[17] In Açıkgöz's study, it was stated that those with higher

income exhibited more bullying behavior.[16] Such differences were not observed in our study. Although bullying was observed more in those with a low number of siblings in the present study, there were studies in which bullying was observed more in individuals with a higher number of siblings.[16] Unlike this study, in Başaran's study, the number of people in the family did not affect bullying.[17] These differences may be since the study was conducted in only one school with a limited sample size.

Bullying was found more frequently among those who had negative views about the school. In another study conducted in Izmir, opinions about the school did not affect bullying.[7] Results regarding the school success were similar to those in the literature.[16, 21] Social support-related variables did not significantly affect bullying in this study. However, in the literature, there were studies in which bullying was more common in individuals with unhealthy family communication.[21] These differences may be due to the differences in the methodology.

The strengths of this study lie in its examination of bullying behavior .Bullying is a fundamental problem in improving school health and adolescent health. The present study evaluates the impact of social support problems on bullying behavior, which is not frequently addressed in Türkiye. An apparent limitation of the study is that it was conducted in a single high school, a vocational high school. As a result of the education, examination, and the high school placement system in Türkiye, sociodemographically disadvantaged students generally receive education in vocational high schools. This situation makes it difficult to generalize the results to all high school youth. Additionally, perceptions of risky behaviors may be measured higher or lower than they actually are in a homogeneous and at the same time disadvantaged study group. This homogeneous study group may have caused limitations in showing the relationships between dependent variables and independent variables. Filling the questionnaire at school may have caused students anxiety when answering some questions. For this reason, different answers may have been given to some questions. In order to control this, it was explained to all participants that their identity information and all answers would be completely confidential, would not be shared with the school administration and that the data would be used only for research purposes. Since the bullying behavior was evaluated by asking for the past two months, some questions may be answered with less accuracy due to memory constraints. The results of the present study have shown that social support is effective in dealing with bullying and reducing bullying. The results of the present study can serve as a basis for further research and for the attempts to reduce bullying behavior in adolescents.

CONCLUSION

The findings of this research highlight the efficiency of social support in addressing and mitigating bullying, providing a foundation for future studies and interventions aimed at reducing bullying among adolescents. School health programs should involve collaboration between teachers, administrators, parents, and students to create a unified approach to tackling bullying.

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ORIGINAL ARTICLE

Surgical mask usage effects: a self-questionnaire study of 7.014 responders during the COVID-19 pandemic

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Abstract

Objective: WHO has advised to conduct research the adverse consequences of surgical mask use in the community. This study aimed to determine the effects of surgical mask use during the COVID-19 pandemic.

Methods: This descriptive study was conducted with 7014 respondents from 81 provinces of Turkey between August and November 2021. In the collection of data, a form on socio demographic characteristics, knowledge level questionnaire on surgical mask use, surgical mask usage characteristics questionnaire, and questionnaire on symptoms related to surgical mask use were used. In the analysis of the data, number, percentage, mean, standard deviation, Chi-square, and logistic regression analysis were used.

Results: The mean age of the respondents was 33.1±12.5 years, 54.8% of whom were women. 42.4% of the respondents stated that they felt protected by the mask and 69.7% of them stated that they had problems with the use of masks. The mean score of the respondents' knowledge questionnaire regarding the use of surgical masks was found to be 5.33 ± 1.88. The mean symptom score of the respondents after the use of surgical masks was 2.57±2.67. During mask use, respiratory symptoms were seen most commonly, by 72.9% of the respondents. There was a significant relationship between male gender, chronic disease, not washing hands after contact with masks, removing masks in public enviroment, having spare masks, and symptoms after surgical mask use (p<0.05).

Conclusion: Hand contact with the mask, and not washing the hands afterwards, removing the surgical mask were modifiable factors that increase the risk.

Keywords: Mask, COVID-19, Personal Protective Equipment

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INTRODUCTION

Coronavirus disease (COVID-19) was an infectious disease caused by a newly discovered coronavirus, and it was first seen in the world in Wuhan, China in December 2019,[1] and for the first time in Turkey on March 10.[2] COVID-19 was a global social crisis,[3] and the WHO classified the COVID-19 outbreak as a pandemic on March 11, 2020, due to its highly contagious nature.[4]

SARS-CoV-2 virus transmission is known to occur through respiratory droplets and contact. Coughing, sneezing, talking, breathing and touching cause the virus to spread.[5] WHO recommends that methods of protection against coronavirus include maintaining physical distance, avoiding crowds and close contact, washing hands frequently with alcohol-based hand sanitizer or soap and water, and covering the mouth and nose with bent elbow or handkerchief when coughing or sneezing as methods of protection from coronavirus. In addition, a mask should be worn properly in settings with inadequate ventilation and impossibility of physical distance.[4] It has been reported that the use of masks in the community during past epidemics prevented transmission during the course of infectious diseases such as influenza.[5,6] It has been stated that the use of masks should be considered as an additional preventive strategy during the COVID-19 pandemic.[7]

The use of surgical masks has been identified by the WHO as one of the preventive measures to limit the spread of COVID-19 pandemic.[8] The Centers for Disease Control and Prevention (CDC) has also stated that mask use is a critical public health tool.[9] With the declaration of COVID-19 as a pandemic,

the use of masks became mandatory, and by the end of June 2020, approximately 90% of the world's population had to comply with mask use laws.[5] In Turkey, the use of masks became mandatory by province in May 2020 and a mask requirement was introduced when going out in 25 provinces. The mask requirement was lifted after 629 days, with the exception of hospitals.[8,10,11]

The most important advantage of using masks in infectious diseases such as COVID-19 is that when used correctly, it prevents the spread of viruses and reduces the risk of transmission.[12] The use of masks has positive effects as well as negative effects. Negative effects of mask use in the community include increased potential risks such as touching the eyes with contaminated hands after touching the face mask, the possibility of self-contamination by the user, experiencing problems such as headaches and/or difficulty breathing, skin lesions, irritation or worsening of acne, difficulty communicating, discomfort with the mask, and a false sense of security.[8] Prolonged mask use has been associated with complaints of dizziness, as well as increased perceived exertion and perceived shortness of breath. Other problems such as acne, nasal bridge scarring, facial itching, redness/ irritation, dry eye and discomfort associated with increased facial temperatures have also been reported with mask use.[13-20] It is thought that mask use may have psychological as well as physiological effects.[21] While WHO recommends the use of masks in the general population, it advises decision-makers to take a risk-based approach. In the risk-based approach, one of the issues to be addressed is to assess the feasibility of using masks. In other words, it is the determination of the negative effects of mask use on people.[8]

This study was aimed to determine the characteristics and effects of surgical mask use during the COVID-19 pandemic and its effects on humans who are not healthcare professionals.

METHODS

Study Design and Participants

This study was a descriptive study designed to determine the characteristics and effects of surgical mask use during the COVID-19 pandemic in Turkey.

This study was conducted between August 12 and November 18, 2021. The study was conducted face-to-face in 81 provinces of Turkey after obtaining the necessary ethical permission to conduct the study. The sample of the study included people over the age of 18 who were not health care professionals, who were not mentally and visually impaired, and who volunteered to participate in the research. To reach the sample, a stratified sampling method was used according to geographical regions to cover all provinces in order to reflect the use of masks in Turkey. In 2019, 83,154,997 people lived in our country. 1,061,635 of them were health care professionals. 22,876,798 of them were children under the age of 18.[22] It was known that there were approximately 788,941 mentally and visually impaired citizens in our country.[23] If health care professionals, children, and the mentally handicapped population were excluded, the total population of the research was 58,427,623 people. The value we predict for the incidence of problems related to the use of masks is 20%. Calculating according to the formula[24] used in cases where the size of population was known, if we accept the sampling error as 1.0% and

the statistical significance level as 5%, it was necessary to conduct this study with at least 6146 people. 6150 adults were planned to be included because some data might be lost. A total of 7474 people were interviewed. It was found that 460 questionnaires were stopped before completion and there were missing data. The sample consisted of 7014 people. The participation rate in the study was 93.8%.

Data Collection

The data of this study were collected face-to-face between August 12 and November 18, 2021. The study was conducted out simultaneously in all provinces of Turkey. For this purpose, services were purchased to conduct the surveys. The collected data were entered into the online system on a weekly basis. Therefore, when all available data were entered, more data were obtained. After eliminating the missing data in the data, the analysis was done with the available data. It took about 8-11 minutes to complete the questionnaire. In the study, a form on socio demographic characteristics, a questionnaire on knowledge of surgical mask use, a questionnaire on characteristics of surgical mask use, and a questionnaire on symptoms related to surgical mask use were used as data collection tools.

Instruments

In the data collection of the research; in accordance with the Sociodemographic Characteristics Form[21] and "Knowledge Level Questionnaire on Surgical Mask Use", "Surgical Mask Usage Characteristics Questionnaire" and "Questionnaire on Symptoms Related to Surgical Mask Use", which were developed by the researchers in accordance with the literature, were used. After the questionnaire

forms were developed, they were submitted to the expert review. The content validity of the questionnaire was ensured. Cronbach's alpha value was calculated and presented for each questionnaire to assess reliablity.

Sociodemographic Characteristics Form; There were a total of 9 questions about respondents' sociodemographic characteristics including age, gender, educational status, place of residence, employment, and chronic disease status.

Knowledge Level Questionnaire on Surgical Mask Use was developed by researchers in accordance with the literature.[21] In the questionnaire form, there were a total of 7 questions including the characteristics of a good surgical mask, the protective properties of the surgical mask, the times and situations when the surgical mask should be put on and taken off, the ways to obtain a surgical mask, methods to avoid the problems associated with the surgical mask, and knowing how to dispose of the surgical mask after use. Respondents answered the questions as I know, partially know, or I don't know. The I know the option was scored 1 point, the partially option was scored 0.5 point, and the I don't know option was scored 0 point. The total score obtained from the questionnaire varies between 0 and 7 points. The Cronbach alpha value of the questionnaire for this study was found to be 0.881.

The Surgical Mask Usage Characteristics Questionnaire was developed by researchers in accordance with the literature.[21] The questionnaire contained 13 questions regarding the characteristics of the respondents' use of surgical masks, the process of obtaining the mask, the characteristics of mask use, applications for problem solving,

hygiene rules, and mask disposal methods. The Cronbach alpha value of the questionnaire for this study was found to be 0.702.

A Questionnaire on Symptoms Related to Surgical Mask Use was developed by researchers in accordance with the literature.[21] The questionnaire contained a total of 30 questions, including 29 different symptoms that may be experienced due to the use of masks in accordance with the literature, 30 closed-ended questions, and one open-ended question about the practices they have used to solve the problems they have experienced. Respondents answer to closed-ended questions as having problems or not having problems. The I have problems option was scored as 1 point, and the I do not have problems option was scored as 0 points. The symptom score was obtained as a sum of the symptom responses. The total score obtained from the questionnaire varied between 0 and 29 points. The Cronbach alpha value of the questionnaire for this study was found to be 0.744.

Data Analysis

SPSS (Statistical Package for the Social Sciences) for Windows 21.0 (IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.) was used to analyze the data obtained from the research. Sociodemographic characteristics, knowledge levels, and symptoms of the respondents were described with numbers, percentages, means, and standard deviations. The Kolmogorov-Smirnov Test was used to determine whether the data followed a normal distribution. An independent two-sample t-test was used. The level of knowledge about the mask was grouped by cluster analysis according to the occurrence of symptoms. Logistic regression

was used to predict the relationship between mask use symptoms and mask wearing characteristics. Respondents were divided into two groups for logistic regression analysis: "those with 2 or less symptoms" and " those with 3 or more symptoms". Respondents who were younger than 33 years, female, postgraduate, living in a village, not working, had no a chronic disease, had a high level of mask knowledge, usually wore a mask, wore four or more masks, changed a mask often, wore a mask for 1-6 hours, did not touch the mask with their hands, did not remove the mask in a public environment, believed that the mask was protective, and always kept a spare mask were included in the logistic regression analysis as dummy variables. P values less than 0.05 were considered statistically significant for all results. (p<0.05).

RESULTS

Sociodemographic Characteristics

The distribution of the respondents participating in the study by provinces in Turkey was shown Figure 1. The highest participation in the study was from Kahramanmaraş province with a rate of 28.0%, and the lowest participation was from Kırıkkale and Kilis provinces with at a rate of 0.1. In terms of population density, the participation rates in almost all provinces were close to each other (Figure 1).

Figure 1. Distribution of Respondents by Province

The mean age of the respondents was 33.1±12.5 years, of which 54.8% were female. 35.4% of the respondents had a bachelor's degree. 69.2% of the respondents lived in the province. 52.8% of the respondents were employed. 18.8% of the respondents had at least one chronic disease. The sociodemographic information of the respondents was shown in Table 1.

Table 1. Distribution of respondents' sociodemographic characteristics

	n	%
Age *(Mean±SD)*	33.1±12.5	
Gender		
Female	3842	54.8
Male	3172	45.2
Education		
Literate	108	1.5
Primary school	659	9.4
Middle school	824	11.7
High school	1699	24.2
Associate degree	759	10.8
Bachelor's degree	2482	35.4
Postgraduate	483	7.0
Residence		
City	4855	69.2
District	1682	24.0
Village	477	6.8
Working		
Yes	3702	52.8
No	3312	47.2
Chronic Disease		
Yes	1321	18.8
No	5693	81.2

Level of Knowledge About the Mask

55.9% of the respondents stated that they knew the characteristics of a good surgical mask and 62.7% knew the protective properties of the surgical mask. 78.8% of the respondents knew when to wear on

and remove the surgical mask. 79.4% of the respondents knew where to buy the surgical mask, 55.1% knew how to avoid problems caused by a surgical mask and 52% knew how to dispose of the surgical mask (Figure 2).
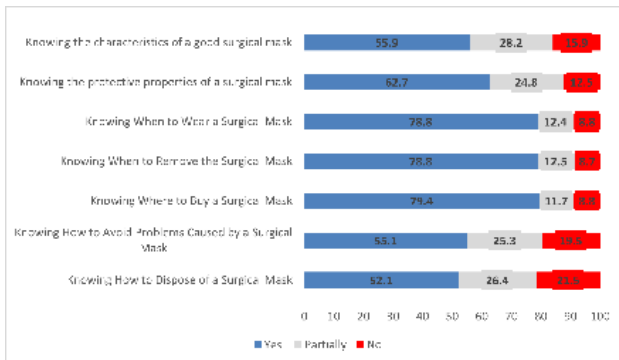
Figure 2. Distribution of respondents' answers to the questions about knowledge about surgical mask use

The mean score of the respondents' knowledge level questionnaire on the use of masks was 5.33 ± 1.88. The rate of respondents with a knowledge level of 4.5 points or less (low) on the use of masks was 28.9%, the rate of respondents between 4.6-5.5 points (moderate) was 16.1%, and the rate of respondents with more than 5.5 points (high) was 54.9% (Table 2).

Table 2. Distribution of the knowledge level of the respondents regarding the use of surgical masks

Knowledge Level	n	%
0 – 4.5 points-Low	2028	28.9
4.6 ve 5.5 points - Middle	1132	16.1
5.6 – 7.0 points- High	3854	54.9
Total Points (Mean±SD)	5.33 ± 1.88	

Information on the Use of Surgical Masks

81.4% of the respondents reported that they provided the surgical masks themselves and 34.1% reported that they wore double masks. 51.3% of the respondents reported that they sometimes changed their masks, and 49.4% reported that they used a mask between 1-6 hours. 80.5% of the respondents reported

touching the mask with their hands and 37.8% reported washing their hands after touching the mask with their hands. 55.8% of the respondents stated that they took the mask off when they were in public and 56.7% stated that they took the mask of while eating. 48.9% of the respondents stated that they disposed of the mask by throwing it in an outside trash can after use. 42.4% of the respondents stated that they felt protected by the mask. It was understood that 83.8% of the respondents chose by considering the protection level of the mask. It was noted that 48.0% of the respondents always carry a spare mask with them (Table 3).

Table 3. Distribution of characteristics regarding the use of surgical masks

	n	%
Mask Supply		
Myself	5709	81.4
Workplace	836	11.9
Friend/Relatives	443	6.3
Other	26	0.4
Stacked Mask Wearing		
Yes	2510	35.8
Two Masks	659	34.0
Three Masks	117	1.7
Four and over Masks	4	0.1
No	4504	64.2
Mask Change Frequency		
None	511	7.3
Sometimes	3599	51.3
Often	2375	33.9
Usually	529	7.5
Time to Use a Mask		
1-6 hours	3465	49.4
7-12 hours	1925	27.4
13-18 hours	886	12.6
19-24 hours	462	6.6
More than 24 Hours	276	4.0
Hand contact with the mask		
Yes	5645	80.5

Table 3. (countined) Distribution of characteristics regarding the use of surgical masks

	No	1086	15.5
	Sometimes	283	4.0
Washing hands after touching the mask			
	Yes	2647	37.8
	No	1502	21.4
	Sometimes	2865	40.8
Removing the mask in a public environment			
	Yes	3915	55.8
	No	3099	44.2
Reason for removing the mask in Public *			
	Eating/Receiving Catering	3975	56.7
	Taking Photo/Video	1555	22.2
	A face-to-face operation	1514	21.6
	Driving	1148	16.4
	Coughing/Sneezing	793	11.3
	Talking on the Phone	560	8.0
	Making Presentation	537	7.7
	Exercising	541	7.7
Dispose of the mask after use			
	No trash outside	3432	49.0
	Any trash in the house	3031	43.2
	Spool in one place	424	6.0
	Waste Bin/Separate Trash	119	1.7
	Other	8	0.1
Feeling Protected with a Mask			
	Yes	2976	42.4
	No	1035	14.8
	Partially	3003	42.8
Features Considered in the Mask *			
	Protection	5878	83.8
	Number of Ply	3640	51.9
	Produced Material	2332	33.2
	Price	1927	27.5
	Color/Pattern	1589	22.7
	Shape	1380	19.7
Availability of Reserve Masks			
	Always	3368	48.0
	Sometimes	3020	43.1
	Never	626	8.9
* More than one option has been ticked.			

Problems Related to Mask Use

The mean symptom score of the respondents after the using surgical masks was 2.57±2.67. While 55.0% (n=3856) of the respondents had two or lower symptoms due to mask use, 45.5% (n=3158) had three or more symptoms. Among the respondents who reported having problems, 72.9% had shortness of breath/difficulty in breathing, 36.6% felt bad/discomfort/restlessness/stress/sense of being in a closed environment, 32.0% had itchy face/nose, 27.5% had ear pain, 24.3% had difficulty smelling, 23.7% were unable to understand their emotions from facial expressions/confusion, 21.3% had fever/sweating, 19.0% had ear sores, 16.3% had acne (Figure 3).
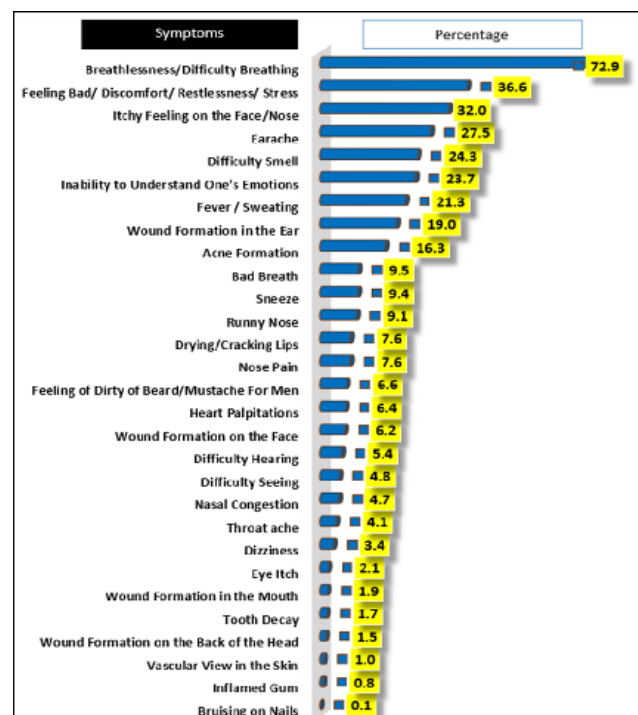

Figure 3. Distribution of Problems Related to the Use of Surgical Masks

Factors Affecting of Mask-Related Symptoms

According to the model constructed according to the symptom score categories related to the use of surgical masks during the COVID-19 pandemic period, there was a

significant association between was male, had a secondary school, high school, and associate degree graduate, had a chronic disease, had a moderate level of knowledge, changed the mask sometimes and often, not washing hands after contact, removing a mask in public, not having a spare mask, and the use of masks and the occurence of symptoms (p<0.05). Female had approximately 0.8 (OR: 0.805; 95%CI: 0.671-0.967, p<0.05) times more symptoms than men. According to postgraduate education status, the risk of mask related symptoms was 0.5 (OR: 0.591; 95%CI: 0.378-0.924, p<0.05) times lower for middle school, 0.6 times lower for high school (OR: 0.661; 95%CI: 0.477-0.917, p<0.05), and 0.5 times lower for associate degree (OR: 0.582; 95%CI: 0.406-0.833, p<0.05). The risk was 1.5 (OR: 1.575 95%CI: 1.214-2.044, p<0.05) times higher in the group with chronic disease than in those without chronic disease, and 0.6 (OR: 0.622; 95%CI: 0.463-0.837, p<0.05) times

lower in those with medium knowledge than in those with high knowledge. The risk was approximately 2 (OR: 1.904; 95%CI: 1.423-2.548, p<0.05) times higher in the group that changed their mask sometimes, the risk was approximately 1.3 (OR: 1.337; 95%CI: 1.025-1.745, p<0.05) times higher in the group that changed it often. The risk increased approximately 2 (OR: 1.938; 95%CI: 1.461-2.569, p<0.05) times in the group that did not wash their hands compared to the group that washed their hands after touching the mask. The risk increased 1.2 (OR: 0.239; 95%CI: 1.031-1.490, p<0.05) times in the group that did not remove their mask in public, and 2.5 (OR: 2.483; 95%CI: 1.465-4.209, p<0.05) times in the group that sometimes removed their mask in public. It was seen that the risk decreased by 0.5 (OR: 0.522; 95%CI: 0.312-0.872, p<0.05) times in the group that did not have a spare mask compared to the group that did (Table 4).

Table 4. Logistic regression results regarding symptoms associated with mask use

Variables	B	S.E.	Wald	p	Exp (B)/OR, (%95, CI)
Age					
<33*					
≥33	0.027	0.138	0.039	0.844	1.027 (0.784-1.346)
Gender					
Female*					
Male	-0.216	0.093	5.379	**0.020**	0.805 (0.671-0.967)
Education					
Literate	-0.295	0.579	0.258	0.611	0.745 (0.239-2.319)
Primary school	-0.176	0.283	0.386	0.535	0.839 (0.481-1.461)
Middle school	-0.526	0.228	5.326	**0.021**	0.591 (0.378-0.924)
High school	-0.414	0.167	6.161	**0.013**	0.661 (0.477-0.917)
Associate degree	-0.542	0.183	8.727	**0.003**	0.582 (0.406-0.833)
Bachelor's degree	-0.181	0.150	1.446	0.229	0.835 (0.621-1.121)
Postgraduate*					
Residence					
Village*					
District	0.435	0.247	3.110	0.078	1.545 (0.953-2.504)
City	0.370	0.238	2.426	0.119	1.448 (0.909-2.308)
Working					
Yes	-0.058	0.103	0.323	0.570	0.943 (0.771-1.154)

Table 4. (countinued) Logistic regression results regarding symptoms associated with mask use

No*					
Chronic Disease					
Yes	0.455	0.133	11.692	**0.001**	1.575 (1.214-2.044)
No*					
Mask Knowledge Level					
Low	-0.089	0.146	0.376	0.540	0.914 (0.687-1.217)
Middle	-0.474	0.151	9.876	**0.002**	0.622 (0.463-0.837)
High*					
Stacked Mask Wearing					
Yes*					
No	-0.168	0.546	0.095	0.758	0.845 (0.290-2.465)
Number of masks					
Two masks	-0.823	1.188	0.480	0.489	0.439 (0.043-4.508)
Three masks	-1.419	1.203	1.391	0.238	0.242 (0.023-2.557)
Four and over masks*					
Mask Change Frequency					
None	-0.084	0.267	0.100	0.752	0.919 (0.545-1.551)
Sometimes	0.644	0.149	18.814	**<0.001**	1.904 (1.423-2.548)
Often	0.291	0.136	4.591	**0.032**	1.337 (1.025-1.745)
Usually*					
Time to Use a Mask					
1-6 hours*					
7-12 hours	-0.155	0.111	1.960	0.161	0.856 (0.689-1.064)
13-18 hours	-0.009	0.168	0.003	0.957	0.991 (0.713-1.378)
19-24 hours	-0.280	0.312	0.809	0.368	0.755 (0.410-1.392)
More than 24 Hours	-0.139	0.463	0.090	0.765	0.871 (0.351-2.157)
Hand contact with the mask					
Yes	0.194	0.124	2.475	0.116	1.215 (0.953-1.548)
Sometimes	0.372	0.199	3.496	0.062	1.450 (0.982-2.142)
No*					
Washing hands after touching the mask					
Yes*					
Sometimes	0.244	0.103	5.571	0.018	1.276 (1.042-1.562)
No	0.662	0.144	21.114	**<0.001**	1.938 (1.461-2.569)
Removing the mask in a public environment					
Yes	0.215	0.094	5.206	**0.023**	1.239 (1.031-1.490)
Sometimes	0.909	0.269	11.406	**0.001**	2.483 (1.465-4.209)
No*					
Feeling Protected with a Mask					
Yes*					
Sometimes	0.137	0.093	2.167	0.141	1.147 (0.956-1.377)
No	0.063	0.150	0.176	0.675	1.065 (0.794-1.428)
Availability of Reserve Masks					
Always*					
Sometimes	-0.068	0.098	0.478	0.489	0.934 (0.771-1.133)
Never	-0.651	0.262	6.156	**0.013**	0.522 (0.312-0.872)

* Reference category/group of the test

DISCUSSION

With the COVID-19 pandemic, the use of surgical masks has been rendered widespread, both as a personal precaution and due to legal obligations, in order to reduce the spread of the pandemic. Çalışmanın yürütüldüğü tarihler arasında maske takma zorunluluğu bulunmaktaydı.[8,] The use of COVID-19 vaccines in Turkey started on January 13, 2021 and 152,734,177 people were vaccinated as of March 3, 2023.[25]

Level of Knowledge About the Mask

In the study, it was found that more than half of the respondents had a high level of knowledge about the use of masks. In the studies, respondents stated that they were informed that the use of masks is protective against COVID-19.[26,27] In a study examining the level of knowledge of students, most of the respondents stated the correct way to use masks and that masks act as a barrier. 32.4% of the participants stated that surgical masks can be used for 8 hours, and 92.2% of the participants stated that cloth masks are as effective as surgical masks in protecting against the COVID-19 pandemic.[28] In another study, respondents stated that they knew the areas where masks should be worn (closed and public places, public transportation).[27] It is thought that the high level of knowledge in this study may be due to the individual answers of the respondents.

Problems Related to Mask Use and Mask Use Behaviours

In the study, it was determined that the most common symptom after mask use in patients was shortness of breath/difficulty in breathing. In one study, after wearing a mask, about half of the respondents reported an increase in difficulty breathing/coughing while wearing a mask.[29] In another study, it was stated that the most common problem encountered by respondents during mask use was breathing difficulties.[28] While some studies reported negligible physiological effects of increased CO_2 concentration on dead space volume,[13,17] other studies have shown a statistically significant decrease in blood O_2 concentration with increased heart and respiratory rate and a feeling of discomfort.[30,31] In another study, while the use of a mask during exercise decreased peripheral oxygen saturation, no difference was found in hemodynamic parameters.[32] The high incidence of respiratory symptoms during mask use in this study was similar to other studies.

The second highest symptom in this study was feeling bad/ discomfort/ restlessness/ stress/ sense of being in a closed environment. In a qualitative study conducted with undergraduate students in Turkey, metaphorical perceptions about the use of masks were frequently identified as "protective shield, prison, and shortness of breath". In addition, in this study in which the psychological effects of mask use were investigated, the positive sub-theme was determined as "trust", while the negative sub-themes were determined as "breathlessness, restlessness, discomfort, communication problems, depersonalization, anxiety, addiction, hopelessness".[33] These symptoms may have emerged due to the obligation to use masks and the perception of the uncertainty and stress caused by the pandemic process as a loss of control.

Again in this study, the inability to understand one's emotions from the facial expression and

the symptoms of confusion are among the first five symptoms. In one study, the use of surgical masks reduced emotion recognition accuracy in both young and old respondents. It showed that it also reduced respondents' overall confidence in their emotional judgments, but not their performance awareness.[34] Considering the area covered by the mask, the closure of facial expressions and gestures that reflect emotions can make it difficult for people to understand their emotions.

Long-term use of the face mask can lead to moisture loss in the stratum corneum of the skin's epidermis, changes in the appearance of the skin, and serious skin problems.[35] In a study, acne (39.9%), facial rash (18.4%), and itching (15.6%) were determined as the most common symptoms due to mask use. In addition, the surgical mask was found to be more risky in terms of skin side effects than the fabric mask. It has been shown that wearing and reusing a mask for at least 4 hours each day increases the risk of skin side effects compared to daily mask replacement.[36] Another study reported itching on the skin at a rate of approximately 20% after 1 week of mask use. Those with atopic predisposition and facial dermatitis (acne, atopic dermatitis) or seborrheic dermatitis are at higher risk.[37] It has been stated that after wearing a mask for a long time, skin characteristics change significantly and acne develops after routinely wearing a mask for at least five hours a day. Other factors that increase the risk of developing acne are female gender, gastrointestinal problems, using moisturizing facial products, having oily or sensitive skin, use of oral contraceptives, stress, acne history, and hot weather.[38] The most common complaint of healthcare professionals was increased sweating (55.6%), followed by acne (34.3%) and oily skin (34.3%). A significant correlation was found between skin changes and mask use time (>6 hours/day), increased number and type of mask used (N 95).[39] Dermatological symptoms were detected in 48.6% of healthcare workers after mask use, and red papules (33.8%), and itching (27.2%) were frequently observed. Wearing a mask for more than four hours a day increased the risk.[40] Surgical mask use caused skin changes in 41.7% of the population, and acne and pustules were frequently observed. It has been determined that the most common location of these is the cheeks. While acne vulgaris affected 8.7% of the total population before mask use, 46.2% was affected after mask use. Skin changes were significantly associated with skin type and mask-wearing time.[41] In this study, it was stated that the symptoms related to the skin were the lowest symptoms observed. The use of surgical masks can be a reducing factor, especially in the occurrence of symptoms related to the skin. In particular, the use of apparatus as the most frequently used protective measure by the respondents may also have contributed to the decrease in the incidence of symptoms.

Factors Affecting of Mask-Related Symptoms

Respondents experience an average of at least 3 symptoms after mask-use. In this study, being female, having a chronic disease, having a low level of mask knowledge, changing the mask sometimes and often, not washing hands after contact with the mask, and removing the mask in public were determined as factors that increase the occurrence of symptoms. In addition, having an education level of secondary school, high school or college, having a moderate level of mask knowledge,

and never carrying a spare mask with you were risk factors that reduced the occurrence of symptoms. One study stated that there were no case reports or laboratory evidence to suggest that touching the mask could cause infection. Mask use creates fear that the public will neglect other measures such as physical distancing and hand hygiene because of an exaggerated or false sense of security.[5] Mask use is positively associated with other preventive measures, including hand hygiene, physical distancing,[8] and contact reduction.[42] This false sense of protection may result in ignoring other essential measures such as hand hygiene and physical distancing, resulting in touching the face and eyes through the mask.[8] In this study, not washing hands after hand contact with the mask increases the risk. For this reason, it is thought that washing hands after mask use can be said as an attempt to prevent symptoms related to mask use and should not be ignored in this sense.

Limitations

This study had some limitations. Due to the descriptive design of the study, no effect of change over time on symptoms related to mask use could be observed. Although there were respondents from all provinces in determining the symptoms and related factors related to mask use, generalizations cannot be made since they were not considered according to population density. Measurement tools were created by researchers in line with the literature. Therefore, its validity and reliability must be tested. However, Cronbach's alpha values calculated from the data obtained were above 0.70. The statements of the responders were taken as basis in determining the symptoms. No physical examination was performed. This may cause some symptoms to be hidden.

CONCLUSION

This study was determined that the respondents had a high level of knowledge about the use of surgical masks. It was determined that the respondents wore surgical masks one on top of the other for protection, and the majority of the respondents used a surgical mask for at least 6 hours, touched the surgical mask by hand, and removed it when in a public environment. While respiratory problems were frequently experienced, it was determined that at least 3 symptoms were observed in the respondents after the use of surgical masks. It was determined that hand contact not washing hands afterward, removing surgical masks in public enviroment were modifiable factors that increase the risk.

In pandemic situations such as COVID-19, after the mask application that is mandatory for all people, the severity of the symptoms can be determined and precautions specific to the symptoms can be taken. Symptoms associated with mask use may affect people's habits of wearing or not wearing a mask. Qualitative studies can be conducted to determine this situation. Depending on the findings, the importance of hand hygiene should be emphasized in order to reduce symptoms related to mask use in pandemic situations, prevent spread and increase comfort, and people should be made aware of mask with them. If it is necessary to remove masks in public areas, special areas can be created.

Conflict of Interest: The authors declare no

conflicts of interest concerning the authorship and/or publication of this article.

Ethical Declaration: To conduct the study, permission was obtained from the Non-Interventional Ethics Committee of Afyonkarahisar Health Sciences University (dated 05.02.2021, no. 2021/88). Permission was obtained from the T.R. Ministry of Health to conduct the study during the COVID-19 pandemic (12.02.2021). Permission was obtained from the department chair to conduct the research (dated 04.01.2021, no. E-17155648-605.01-264). Detailed information about the study for the respondents was included in the data collection form. If the respondents filled out the form, the study permit was accepted as received.

Author Contributions: Concept: ÖSE, MYvG; Design: ÖSE, MYvG; Data collection and entry: ÖSE; Analysis and interpretation: ÖSE, MYvG; Literature: ÖSE, MYvG; Writing: ÖSE, MYvG; Critical review: ÖSE, MYvG.

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ORIGINAL ARTICLE

The evaluation of the correlation between some variables of the countries and COVID-19 incidence of cases and deaths in different variant periods

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Abstract

Objective: The aim of this study is to evaluate the correlation between the incidence case/death rate of coronavirus disease 2019 (COVID-19) and some variables of the countries.

Methods: This research is an Ecological study. We analyzed the association of COVID-19 incidence of cases/deaths with population rates over 65, Gini index, GDP per capita (current US$), burden of disease (DALYs-2019), literacy rate of over 15 years old, Coefficient of Variation (CV) of caloric intake, prevalence of obesity among adults, total COVID-19 vaccine doses administered per 100 people, and total tests conducted (per 1M). Furthermore, we analyzed the data on COVID-19 incidence of cases/death in the cross-sectionally for three periods: Alpha-Beta-Gamma, Delta and Omicron periods. Spearman correlation test was used for statistical analysis.

Results: Positive correlations were found in COVID-19 cumulative incidence of cases/deaths (per 1M), and population rates over 65, GDP (per capita), lliteracy rate of individuals over 15 years old, prevalence of obesity among adults, and total COVID-19 vaccine doses administered per 100 people. On the other hand, negative correlations were found with DALYs, Coefficient of Variation (CV) of caloric intake and Gini index. When the variant periods of COVID-19 were examined respectively (Alpha-Beta-Gamma, Delta and Omicron), the positive correlations and the negative correlations were further increased during the Omicron period.

Conclusion: It is recommended to consider the demographic and socioeconomic characteristics of the countries, as well as the characteristics of the disease agent, for the prevention and control of potential future pandemics.

Keywords: COVID-19, DALYs, Aged, Obesity, Correlation Study

INTRODUCTION

The coronavirus disease 2019 (COVID-19), which was declared as a pandemic by World Health Organization (WHO) in March 2020, still continues. As of March 01, 2023, over 758 million confirmed cases and over 6.8 million deaths have been reported globally.[1]

Risk factors associated with COVID-19 cases and deaths have been identified in the pandemic. Advanced age, presence of chronic disease, obesity and pregnancy are the main risk factors. Approximately 81% of deaths from COVID-19 occurred in people over 65 years old.[2] In a study evaluating data from 16 countries; It has been determined that the mortality rate of COVID-19 is 62 times higher in those aged 65 and over. In the same study, the mortality rate from COVID-19 was found to be 77% higher in men than in women. [3] Obesity has been reported to increase the risk of both COVID-19-related hospitalizations and death.[4]

İncome level has a marked influence on health. According to studies, income inequality has been associated with declining population health.[5,6]. In a study, it was found that there was a positive correlation between the pandemic's mortality burden and national income per capita. For example, it has been determined that Brazil's mortality burden (adjusted by population) is 1000 times greater than Thailand's, despite enormous differences at each income level.[7]

Differences in COVID-19 cases, deaths and incidence among countries may also result from case and death reporting. According to officially reported deaths, while 98% of deaths are due to COVID-19 in the European region, it has decreased to 10% in the African region.[8]

Although the differences in incidence case and death rate among countries are known during the pandemic process, it is seen that the factors associated with this difference among countries have not been sufficiently investigated in the literature. The aim of this study is to investigate the relationship between the incidence case and death rate of COVID-19 and several fundamental variables of the countries.

METHODS

This research was planned as an Ecological study. The research was conducted between January and April 2023. Ethics committee approval was not obtained as this research was conducted with open data.

Research Data

In this study, data from 207 world countries included COVID-19 cumulative incidence of cases and deaths, population rates over 65, Gini index, GDP per capita (current US$), burden of disease (DALYs-2019), Literacy rate of over 15 years old, Coefficient of Variation (CV) of caloric intake, prevalence of obesity among adults, total COVID-19 vaccine doses administered per 100 people, total test (per 1M). Data from some countries were not available. Therefore, the available data were analyzed.

Population rates over 65 and GDP per capita (current US$) for 2021 were obtained from The World Bank. The 15+ literacy rate and Gini index data were also provided by the World Bank, but since the most recent years of data differ from country to country, the countries whose data are available after 2010 were included.[9] Coefficient of Variation (CV) of caloric intake, prevalence of obesity

among adults, total COVID-19 vaccine doses administered per 100 people, COVID-19 cumulative incidence of cases and deaths, Burden of disease (DALYs-2019) were obtained from Our World in Data.[10] Total test (per 1M) were obtained from Worldometers.[11]

We analyzed the data on COVID-19 incidence of cases/death in the cross-sectionally for three periods: the first period is Alpha-Beta-Gamma, the second period is Delta and the third period is Omicron. The first period was taken from January 04, 2020 to May 10, 2021.The beginning of the second period was chosen as the day on which WHO Variants of Concern (VOC) for the delta period declared (May 11, 2021). The second period was taken from May 10, 2021 to Nov 25, 2021. For the Omicron period, the same procedure was applied. (Nov 26, 2021).[12] The last data was taken on January 16, 2023. The third period was taken from Nov 25, 2021 to Jan 16, 2023.

Disability Adjusted Life Years (DALYs)

The sum of mortality and morbidity is referred to as the 'burden of disease' and it can be measured 'Disability Adjusted Life Years' (DALYs). They measure lost health and are used to measure disease burdens. It can be seen that rates in areas with the best health are less than 20,000 DALYs per 100,000 people. This is achieved in many European countries and in some countries (Canada, Israel, South Korea, Taiwan, Japan et.).[13]

Gini Coefficient and GDP (Per Capita)

Gini coefficient and GDP (per capita) are some metrics used for income measurements. The income distribution of a population is measured by the Gini coefficient. Lower values indicate a lower level of inequality. The Gini Index which is provided by The World Bank, has a range of 0 to 100, with 0 denoting no income inequality and 100 denoting the greatest level of income equality.[14,15]

Obesity

The prevalence of obesity is seen in high-income countries across Europe, North America, and Oceania. In South Asia and Sub-Saharan Africa, obesity rates are significantly lower.[16]

Coefficient of Variation (CV) of Caloric Intake

The Food and Agriculture Organization of the United Nations uses "undernourishment" as its primary indicator to assess the availability of food and nutrition. The coefficient variation (CV) calculates the inequity in calorie intake among a population. It is a statistical measurement of the range of data around the mean caloric intake. Higher CV values represent larger levels of dietary inequality. The countries with the highest levels of dietary inequality typically are Sub-Saharan Africa (particularly Zambia, Cote d'Ivoire, and Burkina Faso), Iraq, and Haiti.[17,18]

Statistical Analysis

The analyzes of the data were done via computer. Descriptive statistics such as mean, standard deviation, median, minimum and maximum value were used to summarize the data. The data were tested for normality using Kolmogorov–Smirnov tests. The data were not normally distributed, so Spearman correlation analysis was done. $p < 0.05$ was considered significant.

RESULTS

Positive correlations were found in COVID-19 cumulative incidence of cases/deaths (per 1M), and Population rates over 65, GDP (per capita), Literacy rate of over 15 years old,

prevalence of obesity among adults, total COVID-19 vaccine doses administered per 100 people. On the other hand, negative correlation was found with DALYs, Coefficient of Variation (CV) of caloric intake and Gini index (Table 1).

Table 1. Correlation between COVID-19 cumulative incidence of cases/deaths and some variables

Variables	Median (min-max)	COVID-19 cumulative incidence of cases (per 1M)	COVID-19 cumulative incidence of death (per 1M)
COVID-19 Total Test (per 1M)	765559.5 (5091- 22620639)	+0.881*	+0.647*
GDP per capita (current US$) (n=204)	6930.1 (221.5-234315.5)	+0.850*	+0.649*
Literacy rate of over 15 years old (n=153)	94 (27- 100)	+0.755*	+0.648*
Population rates over 65 (n=207)	8 (1-36)	+0.773*	+0.768*
Prevalence of obesity among adults (n=186)	12.7 (0.5- 53.1)	+0.634*	+0.592*
Total COVID-19 vaccine doses administered per 100 people (n=200)	147.18 (0.22-406.43)	+0.622*	+0.370*
Burden of disease (DALYs-2019) (rates per 100,000) (n=189)	29732.69 (15045.11- 90772.64)	-0.761*	-0.671*
Coefficient of Variation (CV) of caloric intake (n=181)	0.25 (0.17- 0.41)	-0.717*	-0.580*
Gini index (n=154)	35.8 (23.2-63.0)	-0.378*	-0.224**

* $p<0.001$, **$p<0.01$

When the variant periods of COVID-19 were examined respectively (the first period: Alfa, Beta, Gama; the second period: Delta; the third period: Omicron), the positive correlation were between the incidence of cases/deaths and the population rates over 65, GDP (per capita), literacy rate of over 15 years old, and obesity prevalence in adults further increased during the omicron period. Likewise, the negative correlation between the incidence of cases/deaths and Gini index, DALYs, Coefficient of Variation (CV) of caloric intake further increased during the omicron period (Table 2- 3, Figure 1-2).

Table 2. Correlation between COVID-19 incidence of cases and some variables according to variant periods of COVID-19

Variables	COVID-19 incidence of cases (per 1M) (Alfa, Beta, Gama) (n=197)	COVID-19 incidence of cases (per 1M) (Delta) (n=200)	COVID-19 incidence of cases (per 1M) (Omicron) (n=203)
GDP per capita (current US$) (n=204)	+0.588*	+0.612*	+0.828*
Literacy rate of over 15 years old (n=153)	+0.562*	+0.614*	+0.700*
Population rates over 65 years old (n=207)	+0.583*	+0.581*	+0.741*
Prevalence of obesity among adults (n=186)	+0.585*	+0.407*	+0.618*
Burden of disease (DALYs-2019) (rates per 100,000) (n=189)	-0.652*	-0.618*	-0.710*
Coefficient of Variation (CV) of caloric intake (n=181)	-0.538*	-0.491*	-0.701*
Gini index (n=154)	-0.323*	-0.231**	-0.351*

* p<0.001, **p<0.01

Table 3. Correlation between COVID-19 incidence of deaths and some variables according to variant periods of COVID-19

Variables	COVID-19 incidence of death (1M) (First period: Alfa, Beta, Gama) (n=188)	COVID-19 incidence of deaths (1M) (Second period: Delta) (n=191)	COVID-19 incidence of deaths (1M) (Third period: Omicron) (n=200)
GDP per capita (current US$) (n=204)	+0.559*	+0.334*	+0.739*
Literacy rate of over 15 years old (n=153)	+0.572*	+0.574*	+0.676*
Population rates over 65 years old (n=207)	+0.635*	+0.434*	+0.843*
Prevalence of obesity among adults (n=186)	+0.684*	+0.436*	+0.617*
Burden of disease (DALYs-2019) (rates per 100,000) (n=189)	-0.588*	-0.363*	-0.692*
Coefficient of Variation (CV) of caloric intake (n=181)	-0.506*	-0.298*	-0.692*
Gini index (n=154)	-0.204***	-0.017****	-0.343**

* p<0.001, **p<0.01, ***p<0.05, ****p>0,05
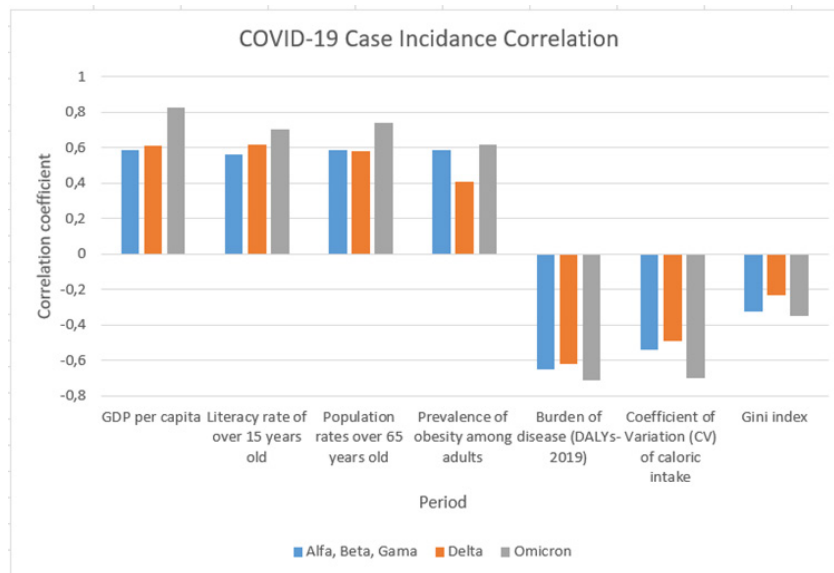
Figure 1. The change of the correlation value between the case incidence and the variables in three different periods during the COVID-19 pandemic process
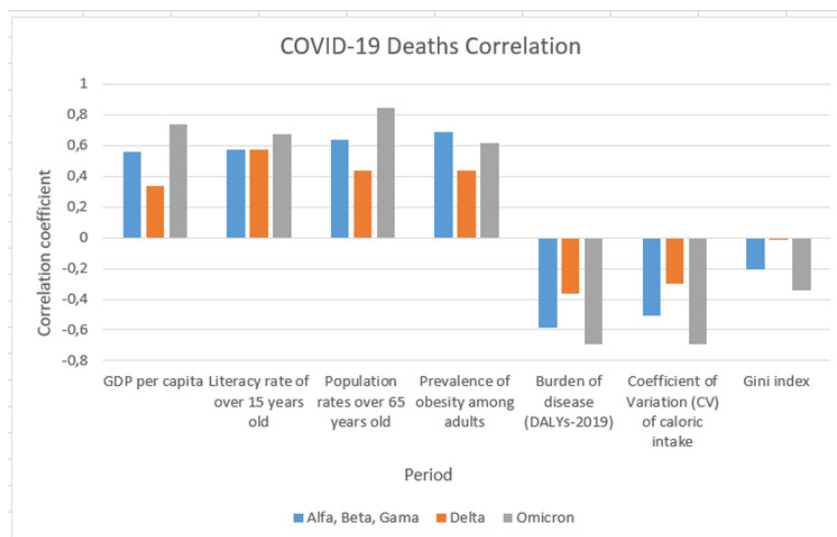
Figure 2. The change of the correlation value between the variables and the deaths in three different periods during the COVID-19 pandemic process

DISCUSSION

The Human Development Index (HDI) is measured by life expectancy, access to education and GDP (per capita). There are significant regional variations, ranging from the lowest in central Africa to the highest values in North America, Europe, Japan, and Oceania.[19] Countries with older populations and high obesity prevalence is high-income countries. High-income countries have aging populations and a high prevalence

of obesity.[16,20] There were also differences between countries in testing capacity and vaccine access (testing capacity and vaccine coverage are higher in high-income countries).[21] In addition, variables like DALYs, the Gini index, and the coefficient of variation of calorie intake differ between high- and low-income countries.[13,15,18] Although DALYs have lower values in high-income countries, the prevalence of cardiovascular disease and obesity is higher in these countries than in

low-income countries.[22] Our study results show that the elderly population, literacy rate, per capita income, obesity prevalence, and the increase in the number of administered COVID-19 vaccine doses are similarly related to increasing the incidence and mortality of COVID-19. On the other hand, DALYs, change in caloric intake, and increase in Gini coefficient are also related to decreasing the incidence and mortality of COVID-19. It is thought that the socioeconomic status of the countries is the determining factor behind the variables clustered in these two groups. The high socioeconomic status both increases the testing capacity and the probability of detecting cases, and also causes an increase in the risky groups defined for COVID-19 cases and mortality (obesity, elderly population ratio). These results show that the socioeconomic level of the countries is a confounding factor in case incidence and mortality in the COVID-19 pandemic.

Some studies in countries and meta-analyses, the incidence of COVID-19 cases and deaths has been linked to low socioeconomic status.[23,24] However, in our study it was found that as GDP per capita increased, the incidence of COVID-19 cases/deaths also increased. To explain this contradictory situation, we examined the African region. At the outset of the pandemic, the weak public health infrastructure raised concerns that the African continent would suffer negative effects. In the days that followed, there were fewer cases and deaths reported. But the infection estimates in the region are approximately 100 times higher than infection reports. According to several serosurveys, large waves of infection hit Africa, but most cases went unreported because they rarely resulted in serious illness. According to a serosurvey conducted in

Zambia, there was only one reported case for every 92 infections that actually occurred. [25] According to evidence from Kenya, Malawi, and the Democratic Republic of the Congo, up to 80% of the population may have been infected by COVID-19 before the omicron variant arrived.[26-28] Although limited testing capacity is a contributing factor, Africa's demography also plays a significant role in the underreporting of cases because of its young population, which results in a high percentage of mild and asymptomatic cases.[29] Because the risk of serious illness and death from COVID-19 increases with age. Even estimates of the total COVID-19 deaths in the African region, which are up to ten times higher than the reported figures, it is the continent with the second-lowest death rate per million inhabitants.[21] The low COVID-19 incidence of cases/deaths in low-income countries may be related to the low test-diagnosis capacity in these countries, as well as the low rate of the elderly population and obesity prevalence.

In a study examining data from 176 countries, they found linear correlations between COVID-19 morbidity/ mortality (per 1M) and GDP (per capita) and overweight/ obesity prevalence (% of population).[8] A study found a negative correlation (−0,665/ p=0.001) between GDP (per capita) and the number of new COVID-19 cases (per 1M). There was no evidence of a statistically significant correlations between obesity and the new cases of COVID-19 (per 1M).[30] The reason for this difference is that this research was conducted only in 38 European countries and in the early months of the Pandemic. An analysis focused on Africa explored factors with potential impacts on the risk of COVID-19 infection and mortality rate. COVID-19 tests per 1 million populations, GINI index and BMI

were significantly associated with the increase in COVID-19 cases per 1 million population in Africa. Furthermore, the prevalence of diabetic patients was significantly associated with the increase in the COVID-19 deaths per 1 million populations in Africa.[31] The highest GDP per capita of the Latin American countries analyzed is that of Panama which was found the highest incidence of cases (per 1M). The lowest GDP per capita of these countries is Haiti that was the lowest incidence of cases (per 1M).[32] Obesity has been observed in other studies as a risk factor for COVID-19-related deaths.[4] According to a study done at the outset of the pandemic, globally, non-communicable disease DALYs were correlated with COVID-19 cases and deaths.[33] In the literature, it is reported that COVID-19 incidence of cases/deaths increases with the increase in income level, except for a study conducted at the outset of the pandemic in high-income countries. It is seen that the increase in obesity and chronic diseases is similarly related to the COVID-19 incidence of cases/deaths.

Although the gradual reduction of inequality in vaccine distribution, high-income countries administer 69 times more vaccine doses per population than low-income countries.[34] High-income countries have vaccinated 75-80% of their populations on the other hand low-income countries have vaccinated <10% of their populations by the end of 2021.[35] A study including 191 countries found a positive correlation between vaccination rate and bi-weekly incidence rate and a weak negative correlation between vaccination rate and case fatality rate.[36] Although the disease prevention effect of COVID-19 vaccines against variants has decreased, it is not enough to explain the positive correlation between COVID-19

incidence of cases/death (per 1M) and total COVID-19 vaccine doses administered per 100 people.[37] This paradox can be explained by the average age of the population, the comorbidity index of the population, herd immunity. [38]

According to a meta-analysis of 39 studies, the fatality rate for COVID-19 was 3% in those under 50, it was 19% in those over 50. [39]According to a study using compiled age-specific death data from 9 countries, the risk of COVID-19 mortality is significantly higher for the old people than for the younger ones. About 70% of COVID-19 deaths in the USA occur in people aged 70 or older.[40] Likewise in our research, we found the COVID-19 incidence of cases/deaths higher in countries with a high population over 65**.** İn COVID-19 pandemic, age became one of the most important factors in the incidence and mortality of the disease. In our study, the positive correlation between the population aged 65 and over and the incidence and mortality of the disease supports this relationship.

Our study is unique in the literature, the correlational relationship was analyzed by dividing the COVID-19 pandemic process into three separate periods according to the variants unlike other studies. It was found that the correlational relationship obtained with the independent variables was similar in three different periods, but the correlation coefficients (more pronounced in case incidence) were higher in the omicron variant period. This can be explained by the fact that the dominant omicron variant in the last period of the pandemic was more contagious and the vaccines used had lower protection against this variant.

CONCLUSION

As a result, there is a positive correlation between COVID-19 incidence of cases/death and population rates over 65 years old, GDP per capita, literacy rate over 15 years old, prevalence of obesity among adults, COVID-19 Total Test (per 1M) and total COVID-19 vaccine doses administered per 100 people; there is a negative correlation between COVID-19 incidence of cases/death and the Gini index, DALYs and Coefficient of Variation (CV) of caloric intake. The level of correlation is higher in the Omicron variant period than in other periods. This scientific evidence detected in the COVID-19 pandemic will be a guide for pandemics in the future. To prevent a possible pandemic in the future, it is recommended to consider the demographic and socioeconomic characteristics of the countries as well as the characteristics of the disease agent.

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ORIGINAL ARTICLE

Turkish validity and reliability of the Lawton instrumental activities of daily living scale

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Abstract

Objective: The aim of this study was to assess the validity and reliability of the Turkish version of the Lawton and Brody Instrumental Activities of Daily Living Scale.

Methods: The research is a methodological study and the study sample consisted of 399 elderly individuals. The ata were collected between May 15 and July 16, 2019. The study utilized the sociodemographic information form, the Lawton and Brody Instrumental Activities of Daily Living Scale, and the Functional Autonomy Measurement System as data collection tools.. The SPSS 22 program was used for data analysis.

Results: The following results were obtained: reproducibility=0.927, minimum marginal reproducibility=0.678 and scalability=0.775. There was a high and positive correlation between the Lawton and Brody Instrumental Activities of Daily Living Scale and the Functional Autonomy Measurement System total score (p<0.001; r:0.88).

Conclusions: The Turkish version of Lawton and Brody Instrumental Activities of Daily Living Scale was deemed valid and reliable.

Keywords: Aged, Lawton and Brody Instrumental Activities of Daily Living Scale, psychometrics, Türkiye

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INTRODUCTION

Determining the dependency levels of the elderly is related to maintaining their level of independence (preventing further deterioration); improving their quality of life and reducing the social costs related to dependency. For individuals over 65 years of age, determining the levels of mild, moderate, severe and full dependency is important for utilizing available resources according to the level of dependency; ensuring that the needs identified to provide social care are proactive and planning the content of social support (determining the interventions to be made to promote the autonomy of the elderly). According to the dependency status and care needs of the elderly, the number of elderly-friendly facilities in the community (e.g. community cultural activity centers, universities for the elderly, cafes or tea rooms) is increased, and the elderly are more likely to benefit from basic preventive care services in the community. In societies where the dependency levels of the elderly are not known and the necessary social support is not provided, health inequalities increase and the sustainability of healthy ageing decreases. Healthy aging is a public health problem that directly concerns the individual, society and local governments.[1,2]

There are many scales in Türkiye and worldwide that measure the daily life activities of elderly individuals based on their physical and cognitive abilities and determine their degree of dependency in carrying out these activities. The Katz Activities of Daily Living Scale, the Barthel Activities of Daily Living Index, the Lawton Instrumental Activities of Daily Living (Lawton IADL) are among the scales that are frequently used both around the world and in Türkiye.[3]

The Lawton IADL was developed by Lawton and Brody in 1969[4] and is frequently used in international studies. Reviewing articles published between 2012 and 2019, only 12 studies were found to have been conducted in Türkiye that included the Lawton IADL scale.[5-16] Some of these studies[6-14] used different scoring systems, while some[6,7,9,11,14,15] cited different studies that included the Lawton IADL scale. All the cited references in the related articles[6,7,9,11,14,15] were accessed and it was observed that the steps to adapt scales normally used in Turkish adaptation studies were not followed for this scale. No findings related to the validity and reliability of the scale were found in the descriptive, cross-sectional or review studies which cited the Lawton IADL scale. Despite this, it was stated that validity and reliability studies had been conducted for the scale and that these studies had been cited. Nevertheless, the Lawton IADL scale was used in 14 studies conducted across different disciplines in Türkiye which were published between 2010 and 2019 in the Web of Science index.[5,11,12,17-27] The use of the scale has increased in Türkiye in recent years. The original form of the Lawton IADL scale is a Guttman-type scale that consists of eight items. Each item has more than one statement and scores either 0 or 1 points in order to define whether individuals are dependent or independent.[4] Guttman scales differ from Likert-type scales; therefore, different types of analysis are recommended in order to examine their reliability.

The aim of this study was thus to investigate the evidence regarding the validity and reliability of the Turkish version of the Lawton IADL scale for individuals aged 65 and over

using the analytical methods recommended for Guttman scales.

METHODS

Research type

The research had a methodological, epidemiological design.

Language Translation

In this study, the scale was translated into Turkish by an expert from a Department of Turkish-to-English Translation and Interpreting. The opinions of a psychiatrist, a public health specialist and a geriatrist were obtained. The scale's language was revised in line with the opinions of the experts. In the original form of the scale, the fourth item, "Housekeeping", includes five statements that range increasingly from conditions of independence to dependence. The fourth statement and the fifth statement were caused confusion both in the expert evaluations and recommendations and during pre-application. To prevent any problems in scoring the scale, the two statements were combined into one statement while maintaining the integrity of their content.

Study Group

The data collection phase of the research consisted of two parts. The study group consisted of individuals aged 65 and over living in the provincial center of Burdur and in the Serik district of Antalya Province. A sample size of approximately 400 is recommended when the sample size is not calculated based on the number of items.[28] The sample size was determined to be 450 on the basis ofissues that might arise such as unanswered items or incomplete answers. The quota sampling method, one of the improbable sampling methods, was used for the sample selection.

The individuals who participated in this study were informed that the study had a second phase during which the scale would be re-administered. For this reason, they were asked to provide their name, surname, telephone number and address. All those who voluntarily supplied this information were included in the study.

In the test-retest phase of the data collection (the second part), the data were re-collected from 142 individuals who had participated in the first part of the study and had agreed to take part again.

The inclusion criteria were: living in the provincial center of Burdur or the Serik district of Antalya province, being 65 or over, being able to understand questions, agreeing to participate in the study, and agreeing to participate in the second phase of the study.

Data Collection Tools

The data were collected using a personal information form consisting of 15 questions regarding sociodemographic information, the Lawton IADL scale, and the Functional Autonomy Measurement System (FAMS).

Lawton Instrumental Activities of Daily Living Scale

This scale was developed by Lawton and Brody (1969). The Lawton IADL scale consists of eight items and evaluates the ability of individuals to perform tasks related to the activities of daily living. It consists of eight functional areas, including "Ability to use atelephone", "Housekeeping", "Mode of transportation", "Laundry", "Responsibility for own medication", and "Ability to handle finances". Responses to each statement in

the scale are scored as 0 (unable or less able) or 1 (able) and the total score is obtained by adding up all item scores. The score obtained from the scale ranges from 0 (low function, dependent) to 8 (high function, independent). A low score indicates a high dependence level.[4] The Lawton IADL was developed for individuals aged 65 and over living in the general community. There is no complete information about the method of selection of the items of the scale and why these items were selected. It is known that parallel test analyses were performed during the development of the original scale and the scale correlated with some other scales [For construct validity, the Lawton IADL demonstrates a moderate positive correlation with the Physical self-maintenance scale and between the Lawton IADL and the Mental Status Questionnaire ($p < 0.01$, Physical self-maintenance scale Pearson's r = 0.61, Mental Status Questionnaire Pearson's r = 0.48)].[29]

The scale is a Guttman type scale. The Guttman Scale is concerned with the consistent answers given by the participants to the questions in the scale. If the scale prepared in accordance with the Guttman scaling technique gives consistent results, that scale is considered unidimensional, that is, valid. Guttman scales are unidimensional and reproducible. When the total score obtained from the scale is known, it can be predicted which items the person said yes to (cumulative feature). Scalogram analysis and reproducibility coefficient are among the analyses performed. Guttman-type scales are difficult to prepare and apply and require expertise.[30]

Functional Autonomy Measurement System

The FAMS evaluates the functional independence and disability levels of individuals aged 65 and over. The scale evaluates 29 functions related to the activities of daily living: mobility, communication, mental functions and instrumental activities of daily living. The scale was adapted to Turkish by Tuna and Çelik in 2012. In the adaptation of the scale, a structure consisting of three subdimensions including activities of daily living, communication and mental functions was created.[31]

Data Collection

The data collection phase was completed with 450 individuals (399 individuals included in the evaluation) who agreed to participate in the research between May 15 and July 16, 2019. Since the study was conducted with individuals aged 65 and over in Burdur province and Serik district of Antalya, no specific setting or criteria were used for the selection of participants. Cafes, coffee houses, parks, playgrounds, streets and markets were visited for data collection. The individuals included in the study were identified by researchers residing in Burdur and Antalya. Individuals who volunteered to participate in the study and who agreed to participate in the study for the second time if they were included in the test-retest group were included in the sample group. The data collection form was filled in by the researchers in line with the answers given by the participants. It took approximately 35-40 minutes for the researchers to read the questions in the data collection form and mark the answers.

The same data collection tool was re-administered to 146 individuals (142 individuals included in the evaluation) after two weeks to complete the test-retest phase.

Data Analysis

When the incomplete forms were excluded, the data of 399 individuals who participated in the first phase of the research and 142 individuals who participated in the second phase (test-retest) were assessed. The SPSS 22 program was used for data analysis. $p < 0.05$ was accepted as statistically significant.

Item Analysis and Creation of Scalogram

The Lawton IADL scale for item analysis, the independence rate of each item was calculated by dividing the number of individuals who gave the "independent" answer (those who answered "1" to a statement were considered independent for that statement) by the total number of respondents, which was 399.[30,32]

The statements remaining on the scale after analysis were arranged from the one that showed the most independence to the one that showed the least independence and a scalogram model was created. The data obtained from a scalogram model were used to determine the number of errors in the reliability analysis and the total number of correct estimations.[32,33]

Reliability and Validity Analyses

The reproducibility and scalability coefficients, which form part of the reliability analysis of Guttman scales, were calculated.

To calculate the producibility coefficient, the *number of* errors was determined for the Lawton IADL scale for which the scalogram model was created. After the number of incorrect answers was determined, the formula of Number of Items x Number of Respondents was used to determine the total number of estimations. Accordingly, the Producibility Coefficient (R), a measure of

the reliability of the scale that is calculated with the formula 1 - (Number of Errors/Total Number of Estimations), was calculated.[33]

The number of correct estimations was found for the Lawton IADL scale in order to calculate the scalability coefficient and the total number of estimations was used again. To calculate the number of correct estimations, the number of answers repeated the most was found in the scalogram model. The method used to determine the total number of estimations was described in the producibility coefficient calculation section (in the above paragraph). To calculate the scalability coefficient, first, the Minimum Marginal Reproducibility (MMR) Coefficient was calculated with the formula of Number of Correct Estimations / Total Number of Estimations. After the calculation of the MMR, the Scalability Coefficient, which is among the criteria for scale reliability and is calculated with the formula (Reproducibility Coefficient - Minimum Marginal Reproducibility) / (1-Minimum Marginal Reproducibility), was calculated.[33]

For the test-retest reliability, the correlation between three subgroups and two separate total sums (102 individuals for the test-retest phase, 142 individuals with the data from 40 individuals collected by different researchers) were evaluated.[34,35]

In the data analysis, the parallel tests method for reliability (also known as concurrent validity in the validity analyses) was implemented.[36] In this study, the FAMS was used to test the parallel tests method. Furthermore, as explained in the language translation and pre-application sections, expert opinions were obtained for face validity and a pre-application was performed.

RESULTS

Of the participants, 58.1% were female; 71.7% were aged between 65 and 74; 68.9% were married; 49.4% were primary school graduates; 58.9% were living with their spouses (Table 1).

The ages of the participants were 72.05±6.96 (minimum=65; maximum=101).

Table 1. Distribution of Individuals Aged 65 and Over who Participated in the Study According to Various Sociodemographic Characteristics

Characteristics of Participants (n=399)		n	%
Sex	Female	232	58.1
	Male	167	41.9
Age	65-74 years	286	71.7
	75-84 years	85	21.3
	85 years and over	28	7.0
Marital Status	Married	275	68.9
	Widowed	117	29.3
	Other*	7	1.8
Educational Status	Illiterate	112	28.1
	Literate	62	15.5
	Primary school	197	49.4
	Secondary school	11	2.8
	High school	11	2.8
	University	6	1.5
Economic Status	Poor	127	31.8
	Undecided	49	12.3
	Good	223	55.9
	Retired	54	13.5
Employment Status	Never been employed, still not employed	167	41.9
	Have been employed, still employed	178	44.6
Living Arrangement	Alone	80	20.1
	With spouse	235	58.9
	With Child/ Children	72	18.0
	Other**	12	3.0

Table 1. Distribution of Individuals Aged 65 and Over who Participated in the Study According to Various Sociodemographic Characteristics

Chronic Disease	Yes	279	69.9
	No	120	30.1
Perceived Health Status	Very bad	33	8.3
	Bad	160	40.1
	Undecided	33	8.3
	Good	164	41.1
	Very good	9	2.3
Status of Using a Device	I don't use any devices	191	47.9
	I use a device	208	52.1
	Glasses	*87*	*41.8*
	Cane	*85*	*40.8*
	Prosthesis	*13*	*6.3*
	Other***	*23*	*11.1*

*Two individuals were single; five individuals were separated. **Three individuals were living with a careworker; four individuals were living with their spouses and children; one individual was living with their adopted child; two individuals were living with their spouses and grandchildren; two individuals were living with their grandchildren. ***nine individuals were using wheelchairs; eight individuals were using hearing aids; six individuals were using crutches.

There was a statistically significant correlation between the dependence/independence of the individuals aged 65 and over in all items of the Lawton IADL scale and their sex. The men's level of independence was higher in the statements related to the ability to use telephone ($p<0.01$), shopping ($p<0.001$), transportation ($p<0.001$), responsibility for own medication ($p<0.01$) and finances ($p<0.001$). The women's independence was higher in the statements related to food preparation ($p<0.001$), housekeeping ($p=0.011$), and laundry ($p<0.001$) (Table 2).

Table 2. Distribution of Dependence/Independence According to the Lawton IADL Scale of Women and Men Aged 65 and Over who Participated in the Study

Items		Female		Male		x^2; p value[1]
		n	%	n	%	
1 (Ability to Use Telephone)	Dependent	34	14.7	10	6.0	7.434;
	Independent	198	85.3	157	94.0	0.01
2 (Shopping)	Dependent	159	68.5	46	27.5	65.308;
	Independent	73	31.5	121	72.5	0.001
3 (Food Preparation)	Dependent	143	61.5	140	83.8	23.196;
	Independent	89	38.4	27	16.2	0.001
4 (Housekeeping)	Dependent	48	20.7	69	41.3	6.507;
	Independent	184	79.3	98	58.7	0.011
5 (Laundry)	Dependent	59	25.4	118	70.7	80.475;
	Independent	173	74.6	49	29.3	0.001
6 (Transportation)	Dependent	90	38.8	27	16.2	23.985;
	Independent	142	61.2	140	83.8	0.001
7 (Responsibility for own Medication)	Dependent	62	26.7	21	12.6	11.800;
	Independent	170	73.3	146	87.4	0.01
8 (Finances)	Dependent	127	54.7	22	13.2	71.707;
	Independent	105	45.3	145	86.8	0.001
Total		232	100.0	167	100.0	

[1]Chi-squared test

The total independence and dependence rates of the individuals aged 65 and over who participated in the study were calculated in Table 3. The independence rate for Item 1 was found to be 355 / 399 = 0.89 and the dependence rate for Article 1 was found to be 1 - 0.89 = 0.11. The same calculations were made for the other items. The activities of daily living in which the individuals aged 65 and over who participated in the research were most independent were the ability to use the telephone (89.0%) (Table 3).

Table 3. Descriptive Statistics and Independence and Dependence Rates for the Lawton IADL Scale Items

Items	Definition of Item	Number of Statements in the Item	Independent*		Dependent*	
			n	%	n	%
Item 1	**Ability to use telephone**	4	355	89.0	44	11.0
Item 2	**Shopping**	4	194	49.0	205	51.0
Item 3	**Food preparation**	4	116	29.0	283	71.0
Item 4	**Housekeeping**	4	253	63.0	146	37.0
Table 3. (Countinued) Descriptive Statistics and Independence and Dependence Rates for the Lawton IADL Scale Items						
Item 5	**Laundry**	3	222	56.0	177	44.0
Item 6	**Transportation**	5	282	71.0	117	29.0
Item 7	**Responsibility for own Medication**	3	316	79.0	83	21.0
Item 8	**Finances**	3	250	63.0	149	37.0

*The number of statements in each item varies between three and five. Each of these statements is scored "0" or "1". Participants who choose "0" for the statement are interpreted as being dependent and participants who choose "1" are interpreted as being independent for that statement.

The total number of errors in the Lawton scale scalogram model was found to be 230. According to the scalogram model, the highest score (independence score) obtainable from the scale is "8". This score is possible if one performs the activities of daily living completely independently or at a certain level of independence. The lowest score (dependence score) that can be obtained from the scale is "0". According to the scalogram model, almost everyone was independent in Item 1 and almost everyone was dependent in Item 3 (Table 4). The total number of estimations of the scale was found to be 8 x 399 = 3192. The Reproducibility, Minimum Marginal Reproducibility, and Scalability coefficients of the model were calculated as follows (detailed information about the calculations was given in the data analysis section):

Reproducibility= 1- (230 / 3192) =0.927

Minimum Marginal Reproducibility = 2166 / 3192 = 0.678

Scalability = (0.927 – 0.678) / (1 – 0.678) = 0.775

Table 4. Number of Correct Estimations in the Items

Item Number (Item Definition)	Answer Repeated the Most	Number of Correct Estimations
1 (Ability to use Telephone)	Independent	355
7 (Responsibility for Own Medication)	Independent	316
3 (Food Preparation)	Dependent	283
6 (Transportation)	Independent	282
4 (Housekeeping)	Independent	253
8 (Finances)	Independent	250
5 (Laundry)	Independent	222
2 (Shopping)	Dependent	205
Total		**2166**

The correlation coefficients for the Lawton IADL scale were found to be highly statistically significant and positive for the test-retest phase in all three groups (p<0.001) (Table 5).

Table 5. The Lawton IADL Scale Test-Retest Results

Sample	Test-Retest Results			
	First Measurement	Second Measurement	Statistical Values	
	Mean ± SD	Mean ± SD	r	p
1st Group* (n=52)	5.07±2.41	4.88±2.45	0.888	<0.001
2nd Group**(n=50)	4.60±2.84	4.48±2.76	0.978	<0.001
3rd Group*** (n=40)	4.82±2.64	4.72±2.49	0.964	<0.001
Total for 1st and 2nd Groups(n=102)	4.84±2.63	4.68±2.60	0.938	<0.001
Total for All Groups (n=142)	4.83±2.62	4.69±2.56	0.945	<0.001

*Those who were living in Antalya province and participated in two rounds (the same researcher collected the first-round and second-round data).

**Those who were living in Burdur province and participated in two rounds (the same researcher collected the first-round and second-round data).

***Those who were living in Antalya province and participated in two rounds (different researchers collected the first-round and second-round data).

When the data of the individuals who participated in the first part of the study were examined, there was a significant, high and positive correlation between the Lawton IADL scale and the FAMS total score (p<0.001; r:0.88). For the data collected in the first round of the research, the correlation of the Lawton IADL scale with the subdimensions and the total score of the FAMS was acceptable (Table 6).

Table 6. Correlation Coefficients between the Lawton IADL Scale and the Functional Autonomy Measurement System and its Subdimensions

Sample* Activities of Daily Living		Functional Autonomy Measurement System			
		Communication	Mental Functions	Total	
Lawton IADL Scale	Correlation	0.88	0.54	0.66	0.88
	p-value	<0.001	<0.001	<0.001	<0.001

*Measurements of 399 individuals who participated in the first round.

DISCUSSION

In the original study, the Lawton IADL scale was designed as a measurement tool that investigate the dependence and independence of individuals aged 65 and over. The observer examines the behaviors of the individual and ranks these behaviors.[4] In the literature, there are international studies in which the participants answer the questions on the scale themselves (or through a researcher/interviewer)[37,38] or in which the participants are observed and the questions are scored by the observers/evaluators.[39-41] In studies conducted in Türkiye, participants fill out the form by themselves with the aid of a researcher.[5,11,12,17-20,26] Although the original form of the Lawton IADL scale was designed to be scored by those observing the behaviors of participants, it is commonly implemented using the self-response method. The answers of the participants were filled in by the researchers in this study. This approach, although different from its original design, was chosen for the current study since it was believed that the scale will continue to be used in this way, and that there is thus a need for validity and reliability evidence for both modes of implementation.

The Lawton IADL scale adapted in this study is a Guttman type scale. Such scales

are considered the first example of one-dimensional and cumulative scales. The total score is significant in terms of interpreting the scale's results.[42] In addition to the total score, the reproducibility coefficient obtained through the scalogram model created using the study data has a prominent role. The scalogram model is specific to Guttman scales and provides estimations for the answers to some statement using the answers given to specific statements.[33] According to the cumulative scalogram model, if the total score of an individual is known, which statements the individual answered "yes" to can also be estimated. On a Guttman scale that includes eighteen propositions, if the respondent answered "yes" to the tenth proposition, it is accepted that they also answered "yes" to the first nine propositions in the scale.[30] This study implemented these analyses designed for Guttman type scales.

The fourth and fifth statements for the fourth item, which was defined as "housekeeping" in the original form of the scale, have very similar meanings in Turkish. For this reason, these two expressions were combined into single expression while preserving the integrity of their content. This revision was not made some studies[39,41] conducted to adapt the Lawton IADL scale, and both propositions were used. In this study, such revision was needed according to the expert opinion and the pre-application.

During the adaptation of Guttman scales it is necessary to create a scalogram model in order to determine the reliability coefficients and to calculate the reproducibility and scalability coefficients.[34] In various studies conducted on the adaptation of the Lawton IADL scale, the internal consistency has been determined using the Cronbach's alpha[37-39,41], exploratory factor analysis[37-39,41] and confirmatory factor analysis.[37,38] No calculations regarding the reproducibility and scalability coefficients were found in these studies. In general, it is recommended that the Cronbach's alpha be used to determine internal consistency in graded scales.[28] In the Lawton IADL scale, the answers to each statement score 0 or 1. Since Guttman scales are designed as one-dimensional and cumulative scales[29,30,39], they are not expected to have different dimensions.

The literature states that the reproducibility coefficient of Guttman-type scales should be more than 0.90 and that the scalability coefficient should be more than 0.60.[32,33] In this study the reproducibility coefficient was found to be 0.92 and the scalability coefficient was found to be 0.77. These results show that the Lawton IADL scale, which was adapted into Turkish as a self-evaluation scale, demonstrates the criteria for reliability. Further evidence of scale reliability is obtained by the test-retest method.[43] In the study the test-retest reliability of the scale was examined in three subgroups, and a correlation was determined between 0.89 and 0.98. In other studies test-retest findings reported similar values, 0.98[41], 0.99.[39]

This study also investigated the correlation between the Lawton IADL scale and the FAMS. In the original study, the Physical Self-Maintenance Scale was used to test concurrent validity.[4] In this study the correlation between the Lawton IADL scale and the total score and subdimensions of the FAMS was positive and acceptable.

In the original form of the Lawton IADL scale, the scores obtainable were between 0 and 8 for women and between 0 and 5 for men.[4]

In the original form of the scale, men were evaluated out of a total of 5 points since daily tasks such as food preparation, housekeeping and laundry were performed more frequently by women at the time the scale was developed (1969). It was also thought that care services were provided by women.[4] In this study and many studies in the literature, the score was out of 8 points and no discrimination was made by sex.[37,41] Evaluations out of 8 points for both sexes in the international adaptation studies for the Lawton IADL scale may be due to the high female employment rate and high female contribution to the labor market in the regions where adaptations were conducted.

Lawton IADL measures the degree of dependency of the elderly to whom it is applied. The scale is used in interventions to reduce age-related dependency in older adults, to provide a safe living environment for the elderly and to improve their quality of life. The use of the scale is important for planning the relevant intervention according to the level of dependency and evaluating the effectiveness of the interventions. The scale is used in many areas such as determining the need for home care services and social services in the general community, during hospitalization and during hospitalization. Participants consisted of elderly people residing in the general community, hospital outpatients (such as psychiatric patients) and rural elderly communities.[44]

CONCLUSION

When the validity and reliability analyses of the Lawton IADL in Turkish were examined, values that can be accepted as valid and reliable for the selected sample group were obtained.

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TURKISH JOURNAL OF PUBLIC HEALTH

ORIGINAL ARTICLE

Evaluation of self-competency of family physicians and family health workers in providing health services to Syrian children: an example from Ankara, Türkiye

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Abstract

Objective: Türkiye is an immigrant-intensive country and primary health care services are the first health institution to apply for migrant children. In this research, it is aimed to evaluate how competent family physicians and family health workers working at where high Syrian migration population live consider themselves in providing health services to Syrian children.

Methods: This descriptive research was conducted among 224 family health physician and 250 family health workers in seven districts with a high migrant population in Ankara, Türkiye. Language knowledge and abroad experience was asked to the participants. The questionnaire included the participants' education on migrant health, their experience in providing health care to migrant people. Multinomial logistic regression analysis was used to evaluate factors associated with experiencing difficulties in serving immigrant children.

Results: Over the third-four of the family physicians (78.9%) and more than one-third of the family health workers (31.6%) knew at least one foreign language (p<0.001). Cultural competence and taking immigrant health courses before graduation are associated with low level difficulty in providing child health care (p<0.05). Higher cultural competency scale score is associated lower health service difficulty level in proving health care to immigrant children (p<0.05).

Conclusion: Health professionals have difficulties in providing health services to immigrant children due to training on migrant health and cultural differences. Development of migrant health education is important to reduce the difficulties experienced by health professionals. Supporting foreign language education will facilitate health professionals to remove barriers in communication.

Keywords: Migrant, Child Health, Health Service, Cultural Competency

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INTRODUCTION

Migration is a developing and differentiating phenomenon that has been affecting the whole world since ancient times. Today, there are 281 million immigrants who make up 3.6% of the world's population. Migration continues to increase over the years with changing conditions.[1]

Due to its location, Türkiye is in a region where immigration is intense. After the Syrian crisis in 2011, immigrants started to enter Türkiye. In Türkiye, which faced cultural, social and economic difficulties in the face of the density of Syrian immigrants, whose numbers reached approximately 3.1 million in 2024, the needs for the provision of shelter, education and health services for immigrants have emerged.[2] Syrians under the status of "Temporary Protection" in Turkey were first accommodated in camps, and later moved to other provinces. This situation brought along health, education and accommodation difficulties as well as social and cultural adaptation difficulties in different provinces.[3]

Among the immigrants, children, the elderly, those in poor health, disabled individuals, pregnant and postpartum women are among the groups that can be vulnerable for physical and psychological factors. Children are affected by migration in different ways through their parents and their environment. Immigrant children's health needs are heterogeneous, their health needs are shaped depending on the country they come from, and they may encounter obstacles in benefiting from their right to health.[4] There are racism, discrimination and integration difficulties with the host population. Poverty, poor housing conditions, and difficulty in accessing health services are risk factors for children.[5]

In the study evaluating the births of Syrian immigrants in Ankara between January 2013 and December 2014, it was stated that premature births and pathologies were detected more frequently in this patient group.[6] In a study evaluating the applications of Syrian immigrant children to tertiary pediatric intensive care in Ankara between March 2017 and March 2019, it was determined that the most common reason for admission was respiratory tract infections. This situation is associated with low socioeconomic level and crowded living conditions.[7] In a study where emergency and outpatient clinic applications of Syrian immigrant children were evaluated at a Training and Research hospital in Ankara in 2017, it was determined that emergency service applications of Syrian immigrant children constituted approximately 21% of all applications. It has been stated that recurrent emergency department visits may be due to difficulties in benefiting from primary health care services.[8]

In Türkiye, primary health care services for migrant children are provided by family health centers and migrant health centers in areas where immigrants weighted areas.[9] Health care expenses of immigrants are covered by the Government of Turkey.[10] In a qualitative study conducted with Family physicians serving Syrian immigrants under protection in Türkiye; it was stated that the expectation was similar to other patients. However, the negative impact of not knowing Arabic in serving patients was also emphasized.[11] Family physicians and family health workers also have problems in communicating with immigrant patients due to cultural differences as well as language barrier.[12] Difficulties in communicating with patients' relatives make it difficult to provide treatment and care

information.[13] When nurses with previous experience in providing healthcare services to immigrant patients in pediatric intensive care units from two different provinces in the east of our country and inpatient services are evaluated, their areas of difficulty were communication and treatment difficulties. Language differences and lack of interpreters are problematic areas in communication. In the field of treatment, lack of understanding of the treatment applied; therefore, delay in the treatment process and rejection of treatment are among the difficulties experienced. While the perspective on the child is emphasized within the scope of cultural differences, the differences in nutrition and general hygiene practices were revealed by the research participants.[14]

In the more than 10 years since the Syrian crisis, the problems they have experienced in the provision of health services to migrant patients continue.[15] In particular, it is important to define the difficulties in the health service procurement processes of immigrant children in child health services, which are offered intensively in primary care, in terms of developing practices and policies for this.[16] In this study, it is aimed to evaluate how competent family physicians and family health workers consider themselves in providing health services to Syrian children and the factors associated with this situation.

METHODS

Research design, place and duration: For this descriptive study, it was aimed to evaluate the physicians and family health workers who worked at family health centres in the seven districts in Ankara between November 2021 – February 2022.

These districts are chosen for their central location and higher immigrant population. Republic of Türkiye Ministry of Health COVID-19 Scientific Research Application Approval was obtained in 26.06.2021. Ethics committee approval was obtained from Hacettepe University Non-Interventional Clinical Research Ethics Committee (approval number: 2021/14-47-Document Number 16969557-1607), at the data of 07.09.2021. Institutional approval was obtained from Republic of Türkiye Ministry of Health General Director of Public Health (Document Number: E-51381736-604.01.02) at the date of 15.10.2021 for the study. Volunteerism was accepted as the basis for participation in the research and participants. Written informed consent was obtained from the participants.

Sampling procedures and eligibility criteria: There are a total of twenty-five districts in Ankara Province, and this research is located in Ankara city center. It was carried out in seven districts. These districts are Altındağ, Çankaya, Etimesgut, Keçiören, Mamak, Sincan and Yenimahalle districts. The reasons for choosing these districts are central location and having a higher immigrant population. The entire physicians and family health workers in seven districts are targeted for this study.[17] The location and number of family health centers were accessed with Google Maps. Family health centers that were relocated or out closed were determined and the current addresses were accessed. As planned for the research, a total of 224 family health centers in the seven districts were visited for data collection. For the family health center professionals, 23.3% (n=224) of the physicians and 26.0% (n=250) of the family health workers agreed to participate in the study. Inclusion criteria

included agreeing participation of the study and work experience in the family health centre for at least three months. Exclusion criteria of the study was interruption of the survey response.

Questionnaire Design: For data collection, the questionnaire designed for family physicians and family health workers included the questions aimed to learn having any lecture on migrant health in undergraduate educational and in-service training, experience professional working experience with migrant people, experience in working at primary health care, and their perception on migrants' child health status. The physicians and family health workers were also asked if they knew any foreign language other than Turkish. Additionally, living abroad experience was asked to the participants.

The physicians and family health workers were asked if they have difficulty while providing child health care services to migrant children and they evaluated themselves with scoring. For scoring, the participants were asked to score 5-point scale, as 1 point for the least difficulty and 5 point for the highest difficulty. They were also asked which child health services were difficult to provide to the migrant children

"Primary Health Care Professionals' Cultural Competency Scale (PHCP-CCS)" which was developed by Perng and Watson in 2012 and adapted by Gözüm et al. in 2020, was included in the questionnaire. The scale was consisted of 20 items under three subscales. The scale in Turkish was found as reliable and valid among health care professionals.[18] The Cronbach Alpha coefficient for the scale was calculated as 0.96 for the total score in our study.

The pilot study was conducted with 7 family medicine residency assistants and 2 pediatrics residency assistants. Survey response duration took approximately 15 minutes. After the pilot study, necessary arrangements were made and the data collection form was finalized.

Data Collection Method: In the study, data collection forms were delivered to the family health centers by visits of the researcher. Family physicians and family health workers who agreed to participate in the research, completed their survey on their own. Data collection forms distributed to employees were collected during the visit the next day. For the excuses of the participants, including field service, annual leave etc., suitable survey form retrieval dates were suggested. In data collection form retrieval visits, the family physicians and family health workers that could not been reached at first visit were included on voluntary basis. The data collection process took place during the COVID-19 pandemic period. The researcher was vaccinated in accordance with the Ministry of Health COVID-19 vaccine recommendations. During the transportation to family health centers and visits, distance rules were followed and masks were used.

Statistical Analysis: IBM Statistics Package for Social Sciences (SPSS ver. 23.0) program was used to evaluate the data.

Self-evaluations of family physicians and family health workers regarding the degree of difficulty in providing services to immigrant patients were taken as a minimum of 1 point and a maximum of 5 points. Difficulty at low level was determined as 1 and 2 points, at medium level as 3 points, at high level as 4 and 5 points. In the multinomial logistic

regression analysis, the evaluations were made by comparing the high difficulty group with the other groups.For the self evaluation score, 1 point indicates the least difficulty and 5 point indicates the highest difficulty.

For the "Primary Health Care Professionals' Cultural Competency Scale (PHCP-CCS)" scores evaluation, there are five options for the participants; "strongly agree", "agree", "undecided", "disagree", "strongly disagree". For the 20 items, "strongly disagree" takes 1 point and according to this "strongly agree" takes 5 point. A participant can take scores between 20-100 for the scale. Higher score indicates the higher cultural competency level.

Descriptive statistics were determined as numbers and percentages. The distribution data were determined as means, standard deviation, median, minimum and maximum value. Kolmogorov-Smirnov was used to determine whether or not the variables were distributed normally. The Mann Whitney U test was used for the comparison of independent two-group continuous variables that did not fit into the normal distribution, and the Kruskal Wallis test was used for comparisons with more than two independent groups. For statistical significance, cases with a Type 1 error value (α) below 5% were considered significant.

The difference between groups for categorical variables was evaluated with the Chi-Square test. In the Chi-Square test, in which variables with more than two categories were included, statistically different eyes were determined by comparing the column percentages, and Bonferroni correction was made, and p value was given since multiple comparisons were made.

RESULTS

Most of the family health workers (98.4%) were women, but controversially nearly one in two physicians (51.6%) were women (p<0.001). The mean age of the participants was 42.6 ± 9 (sd), the median age was 42, the youngest was 23, and the oldest was 67. In the distribution of family health workers by age groups, it was observed that they were younger (p<0.001) (Table 1).

Over the third-four of the family physicians (78.9%) and more than one-third of the family health workers (31.6%) knew at least one foreign language (p<0.001). The physicians were abroad for more than one month than the family health workers (respectively, 11.7% and 2.8%, p<0.001) (Table 1). The most known foreign language among the participants is English (96.0%) (not shown in the table).

Only 3.0% (n=14) of the participants stated that they took undergraduate migration health course. Most of the participants (92.4%) stated that they did not take postgraduate migration health course (Table 2).

Table 1. Distribution of Participants by Individual Characteristics (Ankara, 2022)

Individual Characteristics	Family Physician		Family Health Worker		Total		p value
	n	%	n	%	n	%	
Gender							
Male	108	48.4	4	1.6	112	23.7	**<0.001**
Female	115	51.6	245	98.4	360	76.3	
Total	223	100.0	249	100.0	472	100.0	
Age							
34 and under	24	11.4*	66	27.6*	90	20	**<0.001**
35-54	140	66.4	170	71.1	310	68.9	
55 and above	47	22.3*	3	1.3*	50	11.1	
Total	211	100.0	239	100.0	450	100.0	
Knowing a foreign language							
Yes	176	78.9	79	31.6	255	53.9	**<0.001**
No	47	21.1	171	68.4	218	46.1	
Total	223	100.0	250	100.0	473	100.0	
Being abroad for more than one month							
Yes	26	11.7	7	2.8	33	7.0	**<0.001**
No	197	88.3	242	97.2	439	93.0	
Total	223	100.0	249	100.0	472	100.0	

*Cells causing statistically significant difference

-Chi Square test-Bonferroni Adjustment

Table 2. Distribution of Family Physicians and Family Health Workers Participating in the Study by Education in the Field of Immigrant Health and their Experience in Health Service Delivery (Ankara, 2022)

	Family Physician		Family Health Worker		Total		p value
	n	%	n	%	n	%	
Undergraduate Migration Health Course Taking							
Yes	5	2.2	9	3.6	14	3.0	0.250
No	202	90.6	214	85.6	416	87.8	
Don't remember	16	7.2	27	10.8	43	9.1	
Total	223	100.0	250	100.0	473	100.0	
Undergraduate Migration Health Practical Course Taking							
Yes	5	2.2	7	2.8	12	2.5	0.558
No	212	95.1	232	92.8	444	93.9	
Don't remember	6	2.7	11	4.4	17	3.6	
Total	223	100.0	250	100.0	473	100.0	

Table 2. (countinued) Distribution of Family Physicians and Family Health Workers Participating in the Study by Education in the Field of Immigrant Health and their Experience in Health Service Delivery (Ankara, 2022)

Postgraduate Migration Health Course Taking							
Yes	10	4.5	11	4.4	21	4.4	0.300
No	202	91.0	234	93.6	436	92.4	
Don't remember	10	4.5	5	2.0	15	3.2	
Total	222	100.0	250	100.0	472	100.0	
Prior Migrant Health Service Experience							
Yes	35	15.7	48	19.4	83	17.4	0.289
No	188	84.3	199	80.6	387	81.6	
Total	223	100.0	247	100.0	470	100.0	
Working Duration in Experienced Unit**							
<1 year	14	40.0*	7	14.9*	21	25.6	**0.025**
1-4 years	15	42.9	24	51.1	39	47.6	
5-15 years	6	17.1	16	34.0	22	26.8	
Total	35	100.0	47	100.0	82	100.0	
Benefiting from In-Service Training on Migrant Child Health***							
Insufficient	120	78.9	137	72.5	257	75.4	0.107
Partially sufficient	25	16.4	35	18.5	60	17.6	
Sufficient	7	4.6	17	9.0	24	7.0	
Total	152	100.0	189	100.0	341	100.0	

*Cells causing statistically significant difference

**Of the participants (n=83) who had experience of migrant health service before the unit, 82 people answered this question.

***Participants who stated that they did not receive migrant health training after graduation were excluded from the evaluation in benefiting from in-service training on migrant child health.

Note: 224 family physicians and 250 family health workers participated in the study. Participants who did not answer the question were excluded from the evaluation in the table.

-Chi Square test-Bonferroni Adjustment

More than half of the participants (57.8%) stated that they had difficulties in maternity screening. Family physicians stated less difficulty rather than the family health workers for breastfeeding education (p<0.05) (Table 3).

Nearly half of the participants (46.8%) stated that their patients had difficulty in complying with their appointments. In screenings of metabolic diseases, 59.3% of the participants stated that they had difficulties. Family physicians stated less difficulty rather than the family health workers for follow-up of the vaccination (p<0.05). In child nutrition education, one out of two participants (58.7%) stated that they had difficulties. While unawareness of this issue is 9.2% among family physicians, it is 3.0% among family health workers (p<0.05). The increased follow-up/training time allocated to the migrant patient is a difficult situation for more than half of the participants. In the treatment outpatient clinic services, one of the two family physicians had difficulties in providing information about the treatment, explaining the use of medication, additionally prolonging the referral and examination period (Table 3)

Table 3. Participants Percentage Distribution of the Responses Regarding the Situations of Difficulty Experiencing Health Care Services to Immigrants (Ankara, 2022)

Health Service Factors	Family Physician				Family Health Worker				Total				p value
	n	Not having difficulty	I am not aware.	Having difficulty	n	Not having difficulty	I am not aware.	Having difficulty	n	Not having difficulty	I am not aware.	Having difficulty	
Preventive Health Services													
Maternity screening	174	37.0	8.0	54.6	203	35.5	3.9	60.6	377	36.4	5.8	57.8	0.185
Breastfeeding education	174	38.5	12.1*	49.4*	202	35.1	3.5*	61.4*	376	36.7	7.4	55.9	**0.003**
Compliance with outpatient appointment	174	48.9	6.3	44.8	202	41.6	9.9	48.5	376	44.9	8.3	46.8	0.244
Screenings for metabolic diseases	174	40.8	5.2	54.0	202	31.6	4.5	63.9	376	35.9	4.8	59.3	0.150
Vaccination screening	172	40.7	6.4*	52.9	203	36.0	2.0*	62.1	375	38.1	4.0	57.9	**0.040**
Child feeding education	173	37.0	9.2*	53.8	202	34.2	3.0*	62.8	375	35.4	5.9	58.7	**0.020**
Increased follow-up/training time for migrant patient	171	34.5	9.4	56.1	200	29.0	11.5	59.5	371	31.5	10.5	58.0	0.480
Drug treatment applications (IM/IV drug administration)	173	48.0*	7.5*	44.5	202	31.7*	16.3*	52.0	375	39.2	12.3	48.5	**0.001**
Outpatient health services													
Lab test request	137	62.0	6.6	31.4									
Prescribing	172	64.0	4.0	32.0									
Providing information about treatment	173	44.5	4.0	51.4									
Explaining medication use	173	42.2	5.2	52.6									
Referral of a Patient	173	43.9	5.8	50.3									
Increased inspection time	173	43.4	4.0	52.6									

*Cells causing statistically significant difference Note: 224 family physicians and 250 family health workers participated in the study. Participants who did not answer the question were excluded from the evaluation in the table.
-Chi Square test-Bonferroni Adjustment

The cultural competence scale score of the participants who knew a foreign language and who took immigrant health course was found to be higher than the participants who did not know a foreign language and who did not take the course(p<0.05). The cultural competence scale scores of the participants who have more registered immigrant patients in their unit are

higher (p<0.05). Among the participants, the cultural competence scale of those who had a low level of difficulty in providing service to immigrant patients was higher than those who had a high level of difficulty (p<0.01). (Table 4).

Participants who knew a foreign language stated that they had less difficulty while serving immigrant patients than participants who did not know a foreign language (p<0.05). Participants who took a migrant health course before graduation or in-service training stated that they had less difficulty in providing health services to migrant patients compared to those who did not (p<0.05 and p<0.05) (Table 4).

Table 4. Distribution of Cultural Competence Scale Scores of Family Physicians and Family Health Workers Participating in the Study by Education/Service Characteristics of the Participants (Ankara, 2022)

	Cultural Competence Scale Score			Self-Evaluation Scores of Difficulty		
	n	Median (Min-Max)	p value	n	Median (Min-Max)	p value
Knowing a Foreign Language						
Yes	236	65.0(20.0-100.0)	**0.006**	228	4.0(1.0-5.0)	**0.018**
No	202	60.0 (20.0-100.0)		183	4.0(1.0-5.0)	
Being Abroad for More than One Month						
Yes	33	66.0 (22.0-100.0)	0.05	33	4.0(1.0-5.0)	0.123
No	404	61.0 (20.0-100.0)		377	4.0(1.0-5.0)	
Pregraduate Migration Health Theorical Course Taking						
Yes	13	70.0 (54.0-91.0)*	**0.034**	12	3.0(2.0-5.0)*	**0.025**
No	387	61.0 (20.0-100.0)*		362	4.0(1.0-5.0)*	
Don't remember	38	62.5 (38.0-100.0)		37	4.0(1.0-5.0)	
Pregraduate Migration Health Practical Course Taking						
Yes	12	71.0 (21.0-100.0)	0.07	11	3.0(2.0-5.0)	0.222
No	411	61.0 (20.0-100.0)		384	4.0(1.0-5.0)	
Don't remember	15	60.0 (49.0-84.0		16	4.0(2.0-5.0)	
In-service Migration Health Course Taking						
Yes	18	67.0 (21.0-91.0)	0.12	18	3.0(2.0-5.0)*	**0.001**
No	407	61.0 (20.0-100.0)		379	4.0(1.0-5.0)*	
Don't remember	12	65.0 (41.0-84.0)		13	4.0(2.0-5.0)	
Number of Migrant Patients Registered in Family Health Unit						
Under 500 patients	358	61.0 (20.0-100.0)*	**0.035**	337	4.0(1.0-5.0)	0.736
500-1499 patients	31	66.0 (48.0-85.0)		28	4.0(2.0-5.0)	
1500 patients and over	13	70.0 (41.0-86.0)*		13	4.0(2.0-5.0)	

*Cell causing statistically significant difference
-Mann Whitney U and Kruskal Wallis tests

Participants having postgraduate course on migrant health, if they stated "a low level of difficulty in proving health services to migrants" 8.8 times higher than the participant with "a high level difficulty" and the odds for moderate level of difficulty is 11,7 times higher (p<0.05). The participants having higher cultural competence score, who stated that they had a low level of difficulty in serving immigrant patients was 1.083 times higher than those who had a high level of difficulty (p<0.001); participants who stated that they had moderate difficulty in serving immigrant patients were 1.049 times higher than reference group (p<0.001) (Table 5).

Table 5. Evaluating the Relationship of Participants' Self-Assessment of Serving Migrant Patients with Participants' Education and Service Characteristics (Ankara, 2022)

	Coefficient (β)	Standart Error	p value	Odds	Confidence Intervals
Constant	-7.666	1.138	<0.001		
Being a Family Physician/ Family Health Worker*					
Low level of difficulty **	0.642	0.449	0.152	1.901	0.789-4.580
Moderate level of difficulty**	0.344	0.280	0.219	1.410	0.815-2.440
Knowing a Foreign Language *					
Low level of difficulty **	-0.211	0.455	0.642	0.810	0.332-1.973
Moderate level of difficulty**	0.344	0.280	0.238	0.718	0.414-1.245
Pregraduation Migration Health Course Taking*					
Low level of difficulty **	0.752	1.001	0.453	2.121	0.298-15.096
Moderate level of difficulty**	0.693	0.745	0.352	1.999	0.464-8.605
Postgraduation Migration Health Course Taking*					
Low level of difficulty **	2.186	0.948	0.021	8.898	1.387-57.080
Moderate level of difficulty**	2.467	0.722	0.001	11.792	2.864-48.544
Cultural Competence Scale Score*					
Low level of difficulty **	0.079	0.015	<0.001	1.083	1.051-1.115
Moderate level of difficulty**	0.048	0.009	<0.001	1.049	1.030-1.069

Reference: Highly Difficult (Score 4 and Score 5)
* Low Difficulty (Score 1 and Point 2)
** Moderately Difficult (Score 3)
R^2=0.164 (Cox-Snell). 0.204 (Nagelkerke). Model X^2(10) =72.951 p<0.001

DISCUSSION

Language differences and cultural differences play an important role in immigrant health services. Defeating the language barrier between the healthcare professional and the patient makes healthcare service easier. Increasing the cultural competence of healthcare personnel improves migrant health service delivery.[19] The participants with high cultural competence scores have lower difficulty to provide health services to migrants than the others with low cultural competence scores. Enhancing the cross-cultural communication skills for healthcare

service is evaluated as a fundamental part of education.[20] We found that knowing a foreign language, taking course on migrant health before graduation and working at a primary health care unit with a high migrant population have relations with cultural competence scores. In the study in which Yılmaz evaluated the cultural competence level of nurses in Gaziantep in 2020, similarly, the cultural competence level of the participants who speak a foreign language was found to be higher than those who do not.[21] Türker, in a study evaluating 115 nurses working in family health centers in Istanbul, determined that the level of cultural competence of nurses who speak a foreign language is higher than those who do not.[22] In this context, knowing a foreign language was evaluated as a factor for the level of cultural competence, similarly with these studies in the country. It is important to integrate programs that support foreign language learning into education, to reduce the difficulties experienced due to language differences in communication with different cultures, and to create and support course/program content in medical faculties and health sciences faculties for different languages before graduation.

The cultural competence scale scores of the participants who took immigrant health course before graduation and had more registered immigrant patients in their unit were higher (p<0.05). In the study conducted by Yılmaz et al. in 2017 in which family health workers were evaluated in İzmir, it was stated that education and migrant patient service experience were effective to provide health services.[23] Jowsey (2019) revealed that it is important to improve the knowledge and attitude of health professionals towards cultural differences in the provision of health

services that respond to cultural differences.[24] Before graduation, the inclusion of immigrant health in the curriculum is supported in terms of improving immigrant health.[20,25] It is suggested that the content that will improve the knowledge and behaviour towards the development of service delivery that responds to different cultural characteristics should be included in the training program effectively.

Living abroad has a positive effect on people's experience of intercultural differences as well as raising their awareness of their own personalities and aims.[20] In a study evaluating nursing faculty students in Australia, it was found that 89.7% of them had travel experience abroad, and 19.3% had internship experience abroad.[26] In this study, it was evaluated that the frequency of family physicians and family health workers staying abroad for more than one month was lower than the examples in other countries.[27,28,29] Ensuring that students gain experience in terms of academic and social development in different countries by supporting student mobility abroad could support a positive approach to different cultures.

The participants have difficulty to provide maternal and child health care to the migrant people. More than half of the participants (57.8%) stated that they had difficulties in pregnancy follow-up. Studies have shown that immigrants have difficulties in pregnancy follow-up due to the fact that health professionals do not know Arabic and that they have cultural differences.[30,31,32] Batista et al. reduce health inequalities in antenatal follow-ups; therefore, they emphasize that it causes complications by not defining the risks during pregnancy. The lack of easy access to health services may be associated

with deepening health inequalities among immigrant individuals.[33]

Breastfeeding education is very important for the babies to be healthy. In our study, approximately one out of two participants (55.9%) stated that they had difficulty in breastfeeding education. In a study (2019) evaluating the people involved in the breastfeeding education and support program in Bangladesh refugee camps, it was determined that more than half of the participants (58.3%) had difficulties in the education and support process due to communication and cultural differences.[34] In our study, family health workers had more difficulties than family physicians (p<0.05). In breastfeeding education, family health workers have more communication with the patient than family physicians in terms of communication and guidance.[35] The reason can be explained with cultural perspective; most of the family health workers are female, they are more preferred by immigrant patients for questions and counselling.[36]

Metabolic disease screenings, 59.3% of the participants stated that they had difficulties. In their qualitative research, Kroening et al. defined low education level, difficulties in communication, beliefs/values, health perception, traditional health practices in immigrant families as important factors in benefiting from childhood screening services.[37] While therapeutic health services were more on the agenda in Syria before the war, preventive health services and screening programs were not included in national plans.[38] This may be related to the low compliance and participation of families in screening programs.

Family physicians have less difficulty in vaccination follow-up and child nutrition education than family health workers. This situation can be explained by the fact that the duties of family health workers in the childhood vaccination program are reminding of the vaccinations of immigrant children, arranging their appointments and administering the vaccine are in the job description of the family health worker.[39] Çelebi (2019) evaluated the language barrier as an important factor in the difficulty of family health workers, while nutritional recommendations are given by family physicians and family health workers during childhood follow-up.[40]

In outpatient services, one of the two family physicians had difficulties in providing information about the treatment plan, explaining drug use, and prolonging the referral and examination period. Delilovic et al. stated that in addition to language differences, the lack of sufficient information about the health system of immigrant individuals and the difficulty of expressing during the referral cause the examination process to be prolonged.[41] Difficulty in communication due to language difference could be considered as a factor that prolongs the examination period, as it makes communication with the healthcare professional difficult during the examination.

In the advanced analysis model established at the end of descriptive analyses, taking in-service migration health training and higher cultural competency score is associated with low levels of difficulty in migrant health services. Taking migration health course and cultural differences have been evaluated as facilitating factors.[42] Supporting health professionals in providing services

to migrants to gain an attitude that accepts cultural differences improves the quality of service as well as their knowledge, skills and competencies.

In this study, it has been found important that health workers have high scores in the cultural competence scale and receiving in-service training on migrant health in order to not have difficulties while providing services to immigrants.

Study Limitations and Strengths:

One of the strengths of the research is to reach the family physician and family health worker and ask about their interactions with the immigrant population and to evaluate themselves. During this interaction, health professionals' views on child health services of the immigrant population, as well as cultural differences that will affect service delivery, were learned in detail.

Districts farther from the centre could not be evaluated. Difficulties arose as the research was conducted during the COVID-19 pandemic. Family physicians and family health workers who were positive for COVID-19 in family health centres could not be reached. During the visits to family health centres, it was learned that there were family physicians and family health workers who had a health report due to chronic diseases and did not work in that period.

There were family physicians and family health workers who stated that they could not participate in the study due to the patient density in family health centres, since the data collection period was in the winter period and the applications were increased due to upper respiratory tract infections. For this reason, the results of the research cannot be generalized to the population and will not show causality because they only reflect the research group.

For the researches in future, qualitative and quantitative researches in migrant health centers are recommended to evaluate the options of migrant patients about difficulties faced during health service admissions and treatment processes.

CONCLUSION

According to the study findings, the health professionals that took migration health education face less challenges than others. For this reason, it is recommended that family physicians and family health workers should receive training on immigrant health. Interventions within the scope of migration health education for family physicians and family health workers can be planned both for under-graduate period and in the post-graduate period. Health care providers are should be encouraged to learn foreign language and have experience abroad experience during their education. Planning in-service theoretical and practical training that increases cultural competence is recommended to improve immigrant health services.

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ORIGINAL ARTICLE

Sleep quality and related factors in individuals aged 20 and over consulting primary health care centers

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Abstract

Objective: This cross-sectional study aimed to evaluate the prevalence of poor sleep quality and to identify related factors among adults.

Methods: This study was among adults aged ≥20 years registered at Primary Health Care Center in August-September 2022. Primary outcome was sleep quality, which was assessed by Pittsburgh Sleep Quality Index (PSQI). Secondary outcomes were sociodemographic, lifestyle, health characteristics, sleep-related factors, anxiety-depression. Chi-square test for categorical variables was used in univariate analysis, logistic regression models in multivariate analysis was used. SPSS version 23.0 was used for analysis, type-1 error accepted as 0.05.

Results: Participant's average age was 40.98±13.68 years. 34.6% of participants had poor sleep quality. 12.7% of them had abnormal level anxiety while 8.5% had abnormal level depression. Between total PSQI score and anxiety-depression, there was a moderate positive correlation (r=.375,p<0.001;r=.468,p<0.001,respectively). Being older (RR=1.07(95%CI=1.04-1.10)); being female (RR=5.1(95%CI=1.9-13.6)); living in semi-urban area (RR=2.9(95%CI=1.3-6.5)); shift/part-time work (RR=3.9(95%CI=1.1-14.0)); smoking (RR=2.7(95%CI=1.1-6.7)); sleeping in dim light (RR=6.0(95%CI=2.5-14.5)) or sleeping in bright light (RR=9.5(95%CI=3.3-27.5)); being stressed (RR=5.0(95%CI=1.7-14.3)); borderline (RR=3.6(95%CI=1.1-11.3)) or abnormal level (RR=9.5(95%CI=2.6-34.4)) anxiety was found to be related to poor sleep quality.

Conclusion: One out of three people had poor sleep quality. Increasing age, gender, low socioeconomic status, negative lifestyle, poor sleep hygiene and mental health were associated with poor sleep quality. Health-promoting activities should be held to encourage individual's positive health behavior development, in chronic disease follow-ups, sleep quality should be questioned. Since sleep hygiene and mental health were important determinants of sleep quality, people should be informed about how to improve these.

Keywords: Sleep Quality, Sleep Hygiene, Anxiety, Primary Health Care

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INTRODUCTION

Sleep, which constitutes one-third of one's life and is a vital behavior, is one of the requirements of a healthy life and is a temporary state of unconsciousness that can be returned by sensory or other stimuli, but it is an active renewal period that provides rest and prepares person for life again.[1,2] Sleep quality (SQ) is defined as feeling mentally and physically vigorous, rested, ready for next day after waking up, and includes quantitative (sleep latency, duration, number of awakenings) and subjective (depth, restfulness) components.[3,4] Many negative cognitive, behavioral, physiological and emotional changes such as fatigue, distraction, irritability, mental disorder, tension in family and social relationships, loss of appetite or increased carbohydrate/fat intake, increased caffeine/alcohol intake and decreased pain threshold occur in the deprivation of sleep, which is required for the regular functioning of brain and energy storage.[3,5–7] SQ-related problems are important since they are common and can be a symptom of many diseases.[4] Epidemiological studies have suggested that poor SQ is related with mortality and many adverse health outcomes such as increased risk of high blood pressure, diabetes, corpulence, myocardial infarction, cardiovascular and psychiatric disease.[8,9] as well as with a wide range of negative health outcomes. However, few studies have examined the association between sleep and self-rated health, particularly through the combination of sleep complaints. The objective of this study was to examine whether self-rated health is associated with sleep complaints, considering the combination of sleep duration, insomnia, and sleep sufficiency. This cross-sectional study was performed in the 18 largest public hospitals in the city of Rio de Janeiro, Brazil. A total of 2518 female nurses answered a self-filled multidimensional questionnaire. The adjusted odds ratios and 95% confidence intervals (CIs According to studies, 15-35% of the population suffer from widespread SQ disorders such as difficulty falling asleep and maintaining sleep.[4]

According to population-based 'National Study of Sleep Epidemiology in Adults' (TAPES) conducted by Turkish Sleep Medicine Society in 2010, frequency of poor SQ is 21.8%.[10] Prevalence of poor SQ, which has a wide-interval, is between 15.0-53.0% in Turkey and 32.1-63.7% in other countries.[11–18] Conforming to an international multicenter study, 56.0% of those living in the United States (USA), 31.0% of those living in Western Europe, 23.0% of those living in Japan had sleep problems and prevalence of poor SQ ranged from 31.0% to 52.0%.[19]

Problems with SQ are especially associated with psychiatry; anxiety, depression, stress-related factors are the major concomitants.[4] Age, body mass index, familial/social relationships, room temperature, electronic device use are also known to affect SQ.[7] In literature, older age, low education and socioeconomic level, physical inactivity, obesity, smoking, having poor mental and physical health, shift working, poor sleep hygiene were found to be associated with poor SQ.[11,20–22] While most studies suggest that SQ is worse in women, a few have found no association between gender and SQ.[10,11,13–16,20] Also, prolonged use and addiction to electronic devices worsen SQ.[23,24]

Due to lifestyle or environmental factors that disrupt SQ, which is necessary and important

for health and well-being, sleep problems occur over time and cause significant adverse health consequences. Considering that poor SQ prevalence will increase gradually, it emerges as an important social problem. Therefore, our study aimed to assess sleep quality, its relationship with anxiety-depression and other factors among adults aged ≥20 years.

METHODS

Study Design and Sampling

The research is a cross-sectional study. The study was conducted among adults aged ≥20 years registered at three Primary Health Care Center (PHC) in urban and semi-urban areas in August-September 2022. By stratifying the urban and semi-urban areas in Manisa according to their population, two PHCs from the urban area and one from the semi-urban area were randomly selected.

The population of this research consists of 349.813 individuals aged >20 years in Manisa city center. Sample size was calculated as 260 using Epi-Info StatCalc software, version 7.2.3.1 with a confidence interval of 95%, with an expected prevalence of 21.8% [10] and the margin of error was 5%. Individuals aged ≥20 years who applied to the PHC at the time of the study and agreed to participate were included. In case of refusal to participate, data collection was continued until the determined sample size was reached.

Data Collection

Data were collected by face-to-face interview technique, after obtaining consent of participants by researchers, by using a structured questionnaire consisting of six sections. After filling the questionnaire, participants' height and weight were measured and recorded by researcher. 37

people refused to participate and 260 people were reached. The participation rate was 87.5% (n=260/297). The dependent variable of the study is SQ. To assess SQ, Pittsburgh Sleep Quality Index (PSQI) was used.

Study Instruments

Each person completed questionnaire about sociodemographic and lifestyle data (e.g., age, gender, marital status, smoking, physical activity), health (e.g., chronic conditions), sleep-related factors (e.g., caffeine consumption, lighting of the room), anxiety-depression (Hospital Anxiety-Depression Scale, detailed below) and SQ (PSQI, detailed below).

Hospital Anxiety-Depression Scale (HADS): The 14-item self-report scale was developed by Zigmond and Snaith in 1983 to evaluate the level of anxiety-depression, Aydemir et al. conducted Turkish reliability and validity study of the scale in 1997.[25,26] HADS consist of two subscales; anxiety (1,3,5,7,9,11,13. items) and depression (2,4,6,8,10,12. items). Each item is scored from 0 to 3 points and total scores of subscales ranges from 0 to 21. A score between 0-7 considered normal, between 8-10 considered borderline, and ≥11 considered abnormal. The internal consistency coefficients (*Chronbach α*) are measured 0.85 for anxiety subscale and 0.78 for depression subscale.[26]

Pittsburgh Sleep Quality Index (PSQI): PSQI was developed by Buysse et al. in 1989 to make a short and useful SQ assessment that is reliable, valid, standardized, easy to use and evaluate.[4] Ağargün et al. conducted Turkish reliability and validity of PSQI in 1996.[27] Index consists of seven dimensions (subjective sleep quality, sleep latency, sleep duration,

habitual sleep efficiency, sleep disturbance, use of sleeping pills, daytime dysfunction) and 24-item; while first 19-item is based on self-report, last 5-item is answered by a bed partner/roommate. Last 5-item are not included in scoring and are solely used to obtain clinical info. Dimensions are scored from 0 to 3 points. By summing dimensions' points total PSQI score, ranging from 0 to 21, is obtained. While lower points indicate good SQ, higher ones indicate poor SQ. PSQI's cut-off point is 5; ≤5 considered good SQ, >5 considered poor SQ.[4] The internal consistency coefficients (*Chronbach α*) are measured 0.80.

Statistical Analysis

Data were evaluated using SPSS version 23.0 (IBM SPSS Corp.; Armonk, NY, USA) statistical package program. Descriptive data were presented as frequencies and percentage (n%) for categorical variables, mean±standard deviation, median (min-max) for continuous variables. In data analysis, Chi-Square test was used for categorical data, logistic regression analysis was used for multiple analyses. Homer-Lemeshow test was used for model fit. Pearson correlation test was used to compare normally distributed continuous variables, while Spearman correlation test was used for non-normally distributed continuous data. *p*<0.05 was considered statistically significant.

Ethical Approval

Ethical approval numbered 2023/1643 (January 04,2023) was obtained from the Health Sciences Ethics Committee of our institution. The study was carried out in accordance with the principles of the Declaration of Helsinki. Informed consent from participants was obtained. No financial support was received, there is no conflict of interest.

RESULTS

Total of 260 participants were enrolled in the study. Average age was 40.98±13.68 years and approximately ⅓ of them were women. Of the participants, 13.1% were working shifts and 8.0% working part-time, and 21.9%'s income level was less than expenses. More than half of participants were overweight/obese, 24.2% were smokers, 46.2% were physically inactive, 43.8% had a chronic disease (Table-1).

Table 1. Demographic, Lifestyle and Health Characteristics of Participants (n=260)

Variable	n	(%)
Age Mean (SD)	40.98 (13.68)	
Place of Residence		
Urban	111	42.7
Semi-Urban	149	57.3
Gender		
Female	166	63.8
Male	94	36.2
Educational Status		
Uneducated	17	6.5
Primary school	59	22.7
Secondary school	27	10.4
High school	65	25.0
University	92	35.4
Marital Status		
Married/Living With a Partner	181	69.6
Single	57	21.9
Divorced	11	4.2
Widowed	11	4.2
Having Children		
Yes	190	73.1
No	70	26.9
Family Structure		
Extended	17	6.5
Nuclear	226	86.9
Single-Parent Family	17	6.5
Employment Status		

Table 1. (countinued) Demographic, Lifestyle and Health Characteristics of Participants (n=260)		
Unemployed	123	47.3
Full-time	108	78.8
Part-time	11	8.0
Shift-work	18	13.1
Social Class		
Upper	134	51.5
Lower	126	48.5
Income Level		
More than expenses	54	20.8
Equal to expense	149	57.3
Less than expenses	57	21.9
Body Mass Index		
Normal	111	42.7
Overweight	99	38.1
Obese	50	19.2
Smoking		
Never	175	67.3
Former	22	8.5
Current	63	24.2
Alcohol Use		
Yes	101	38.8
No	159	61.2
Physical Activity		
Never	120	46.2
1-3 days/week	101	38.8
>3 days/week	39	15.0
Comorbidity		
Yes	114	43.8
No	146	56.2
Previous Psychiatric Disorder Diagnosed by A Physician		
Yes	32	12.3
No	228	87.7
Prescription Drug Use		
Yes	126	48.5
No	134	51.5
Perceived Health Status		
Very Bad	1	0.4
Bad	8	3.1
Not good, not bad	66	25.4
Good	155	59.6
Very good	30	11.5

SD: Standard Deviation

Of the participants, 94 consumed caffeinated beverages after 6.00 p.m., 112 used electronics before bed. While 15.8% of participants slept in bright room, 26.5% slept in dimly room. One fifth of the participants' perceived stress level in last month was bad/very bad. Table-2 shows other sleep-related factors.

Table 2. Sleep-Related Factors of Participants (n=260)		
Variable	**n**	**%**
Amount Of Water Consumed Per Day		
≤1.5 L	39	15.0
1.6-2.4 L	89	34.2
≥2.5 L	132	50.8
Consumption Of Caffeinated Beverages After 6.00 pm		
Always	46	17.7
Usually	48	18.5
Sometimes	71	27.3
Rarely	37	14.2
Never	58	22.3
Eating In Last 2 Hours Before Bed		
Yes	101	38.8
No	159	61.2
Bedroom Lighting		
Dark	150	57.7
Dimly	69	26.5
Bright	41	15.8
Perceived Stress Level in The Last Month		
Very good	9	3.5
Good	105	40.4
Not good, not bad	90	34.6
Bad	39	15.0
Very Bad	17	6.5
Workplace Stress (n=137)		
Very good	5	3.6
Good	54	39.4
Not good, not bad	48	35.0
Bad	23	16.8
Very Bad	7	5.1
Using Electronics Before Bed		
Always	43	16.5
Usually	69	26.5
Sometimes	54	20.8
Rarely	42	16.2

Table 2. (countinued) Sleep-Related Factors of Participants (n=260)		
Never	52	20.0
Owning a Pet		
Yes	39	15.0
No	221	85.0
Bed Type		
Orthopedic	232	89.2
Floor Bed	11	4.2
Sofa Bed	17	6.5
Assessment of Sleep Patterns		
Very good	15	5.8
Good	156	60.0
Not good, not bad	60	23.1
Bad	21	8.1
Very Bad	8	3.1

Among the participants, 33 had abnormal level anxiety and 22 had abnormal level depression (Table-3).

Table 3. Anxiety and Depression Status of Participants* (n=260)		
Variable	**n**	**%**
Anxiety Mean (SD)	5.42 (4.29)	
Normal	199	76.5
Borderline	28	10.8
Abnormal	33	12.7
Depression Mean (SD)	4.56 (3.91)	
Normal	202	77.7
Borderline	36	13.8
Abnormal	22	8.5

*SD: Standard Deviation, Hospital Anxiety and Depression Scale

Total PSQI score was 4.22±3.04, 34.6% had poor SQ. Mean scores obtained from sub-dimensions of PSQI are given in Table-4.

Table-5 shows factors associated with SQ in univariate analysis. SQ was significantly poorer among those aged more than 45 years, compared to younger participants (p=.006). Females also had poorer SQ compared to males (p<.001). While those secondary school and below education level

had poorer SQ compared to those above it (p=.026). Participants who were shift/part-time workers, were living a semi-urban area, had less income than expenses, had comorbidity, were overweight/obese, were smoking had poorer SQ (respectively; p=.004, p<.001, p=.017, p=.025, p=.014, p=.002). It was found that SQ of those who consumed caffeinated beverages after 6.00 p.m., slept in a lighted room, had bad/very bad stress level in the last month and had bad/very bad workplace stress, used electronics before bed, had abnormal level anxiety and depression is poorer (respectively; p=.002, p<.001, p<.001, p<.001, p=.021, p<.001, p<.001). Correlation analysis between total PSQI score and anxiety-depression showed a moderate positive correlation between total PSQI score and anxiety and depression (respectively; r=.375, p<0.001; r=.468, p<0.001).

Table 4. PSQI, PSQI Sub-Dimension Scores and Sleep Quality* (n=260)		
PSQI Sub-Dimensions	**Mean ± SD**	
Subjective Sleep Quality	1.06 ± 0.69	
Sleep Latency	0.94 ± 0.97	
Sleep Duration	0.34 ± 0.71	
Habitual Sleep Efficiency	0.12 ± 0.48	
Sleep Disturbance	1.04 ± 0.51	
Use Of Sleeping Pills	0.09 ± 0.46	
Daytime Dysfunction	0.63 ± 0.83	
Total PSQI Score	4.22 ± 3.04	
Variable	**n**	**%**
Sleep Quality		
Good Sleep Quality	170	65.4
Poor Sleep Quality	90	34.6

* SD: Standard Deviation, PSQI: Pittsburg Sleep Quality Index, SD: Standard Deviation

Table 5. Factors Associated with Sleep Quality (n=260)

Variable	Good Sleep Quality		Poor Sleep Quality		*p*
	n	**%**	**n**	**%**	
Age					
<30	53	75.7	17	24.3	0.006**
31-45	65	67.7	31	32.3	
>45	52	55.3	42	44.7	
Gender					
Female	94	56.6	72	43.4	<0.001*
Male	76	80.9	18	19.1	
Place of Residence					
Semi-Urban	55	49.5	56	50.5	<0.001*
Urban	115	77.2	34	22.8	
Educational Status					
Secondary school and below	59	57.3	44	42.7	0.026*
High school and above	111	70.7	46	29.3	
Employment Status					
Unemployed	76	70.4	32	29.6	0.004*
Full-time	83	67.5	40	32.5	
Shift-work/Part-time	11	37.9	18	62.1	
Social Class					
Lower	74	58.7	52	41.3	0.029*
Upper	96	71.6	38	28.4	
Having Children					
Yes	116	61.1	74	38.9	0.016*
No	54	77.1	16	22.9	
Income Level					
More than expenses	39	72.2	15	27.8	0.017**
Equal to expense	102	68.5	47	31.5	
Less than expenses	29	50.9	28	49.1	
Body Mass Index					
Normal	79	71.2	32	28.8	0.014**
Overweight	66	66.7	33	33.3	
Obese	25	50.0	25	50.0	
Smoking					
Yes	31	49.2	32	50.8	0.002*
No	139	70.6	58	29.4	
Physical Activity					
Never	71	59.2	49	40.8	0.030**
1-3 days/week	69	68.3	32	31.7	
>3 days/week	30	76.9	9	23.1	
Comorbidity					
Yes	66	57.9	48	42.1	0.025*
No	104	71.2	42	28.8	

Table 5. (countinued) Factors Associated with Sleep Quality (n=260)

Previous Psychiatric Disorder Diagnosed by A Physician					
Yes	10	31.3	22	68.8	<0.001*
No	160	70.2	68	29.8	
Perceived Health Status					
Good/Very Good	137	74.1	48	25.9	<0.001**
Not good, not bad	32	48.5	34	51.5	
Bad/Very Bad	1	11.1	8	88.9	
Amount Of Water Consumed Per Day					
≤1.5 L	18	46.2	21	53.8	0.001**
1.6-2.4 L	54	60.7	35	39.3	
≥2.5 L	98	74.2	34	25.8	
Consumption of Caffeinated Beverages After 6.00 pm					
Never/Rarely	71	74.7	24	25.3	0.002**
Sometimes	49	69.0	22	31.0	
Always/Usually	50	53.2	44	46.8	
Bedroom Lighting					
Dark	126	84.0	24	16.0	<0.001**
Dimly	30	43.5	39	56.5	
Bright	14	34.1	27	65.9	
Perceived Stress Level in The Last Month					
Good/Very Good	92	80.7	22	19.3	<0.001**
Not good, not bad	61	67.8	29	32.2	
Bad/Very Bad	17	30.4	39	69.6	
Workplace Stress (n=137)					
Good/Very Good	48	81.4	11	18.6	<0.001**
Not good, not bad	29	60.4	19	39.6	
Bad/Very Bad	10	33.3	20	66.7	
Using Electronics Before Bed					
Never/Rarely	69	73.4	25	26.6	0.021**
Sometimes	36	66.7	18	33.3	
Always/Usually	65	58.0	47	42.0	
Bed Type					
Orthopedic	158	68.1	74	31.9	0.017*
Floor Bed	6	54.5	5	45.5	
Sofa Bed	6	35.3	11	64.7	
Anxiety					
Normal	156	78.4	43	21.6	<0.001**
Borderline	9	32.1	19	67.9	
Abnormal	5	15.2	28	84.8	
Depression					
Normal	147	72.8	55	27.2	<0.001**
Borderline	18	50.0	18	50.0	
Abnormal	147	72.8	55	27.2	

*Chi-Square Test **Chi-Square Test for Trend; Only statistically significant variables given.

Statistically significant variables with SQ in univariate analysis were included to multivariate analysis. Four models were performed in multivariate analysis (Table-6 and Table-7). As shown in Table-7, according to final model (Model-4), being older (RR=1.07(95%CI=1.04-1.10)); being female (RR=5.1(95%CI=1.9-13.6)); living in a semi-urban area (RR=2.9(95%CI=1.3-6.5)); shift/ part-time work (RR=3.9(95%CI=1.1-14.0)); smoking(RR=2.7(95%CI=1.1-6.7));sleepingin dim (RR=6.0(95%CI=2.5-14.5)) or bright light (RR=9.5(95%CI=3.3-27.5)); being stressed (RR=5.0(95%CI=1.7-14.3)); borderline (RR=3.6(95%CI=1.1-11.3)) or abnormal level anxiety (RR=9.5(95%CI=2.6-34.4)) increased the risk of poor SQ [p<.001,p=.003,p=.032,p=.001;respectively.]

Table 6. Factors Associated with Sleep Quality in Multivariate Analysis* (n=260)

Variable	p^{**}	MODEL 1 RR (95% CI)	p^{**}	MODEL 2 RR (95% CI)
Sociodemographic Characteristics				
Age	<.001	1.04 (1.02-1.07)	<.001	1.05 (1.02-1.07)
Gender				
Male (Reference)		1 (Ref)		1 (Ref)
Female	<.001	3.5 (1.8-7.0)	<.001	4.4 (2.1-9.0)
Place of Residence				
Urban (Reference)		1 (Ref)		1 (Ref)
Semi-Urban	<.001	3.3 (1.8-6.0)	<.001	3.0 (1.6-5.5)
Employment Status				
Full-time (Reference)		1 (Ref)		1 (Ref)
Unemployed	.204	0.6 (0.3-1.3)	.324	0.7 (0.4-1.4)
Shift-work/Part-time	.008	3.7 (1.4-9.7)	.010	3.6 (1.4-9.4)
Lifestyle and Health Characteristics				
Smoking				
No (Reference)	-	-		1 (Ref)
Yes	-	-	.003	2.9 (1.4-5.5)
R^2		0.289		0.341

*Only statistically significant variables given; ****Binary Logistic Regression (Backward-Wald); RR: Risk Ratio; CI: Confidence Interval; R^2: Coefficient of Determination.

Variables Included in Models;

Model 1: *Age, Place of Residence, Gender, Educational Status, Employment Status, Income Status*

Model 2: *Model 1 + Smoking, Body Mass Index, Physical Activity, Comorbidity*

Table 7. Factors Associated with Sleep Quality in Multivariate Analysis* (n=260)

Variable	p**	MODEL 3 RR (95% CI)	p**	MODEL 4 RR (95% CI)
Sociodemographic Characteristics				
Age	<.001	1.07 (1.04-1.10)	<.001	1.07 (1.04-1.10)
Gender				
Male (Reference)		1 (Ref)		1 (Ref)
Female	<.001	5.3 (2.1-13.1)	.001	5.1 (1.9-13.6)
Place of Residence				
Urban (Reference)		1 (Ref)		1 (Ref)
Semi-Urban	.001	3.7 (1.7-7.8)	.008	2.9 (1.3-6.5)
Employment Status				
Full-time (Reference)		1 (Ref)		1 (Ref)
Unemployed	.246	0.6 (0.3-1.4)	.082	0.5 (0.2-1.1)
Shift-work/Part-time	.012	4.8 (1.4-16.5)	.039	3.9 (1.1-14.0)
Lifestyle and Health Characteristics				
Smoking				
No (Reference)		1 (Ref)		1 (Ref)
Yes	.019	2.7 (1.2-6.4)	.025	2.7 (1.1-6.7)
Sleep-Related Factors				
Bedroom Lighting				
Dark (Reference)		1 (Ref)		1 (Ref)
Dimly	<.001	6.2 (2.7-14.4)	<.001	6.0 (2.5-14.5)
Bright	<.001	11.4 (4.1-31.8)	<.001	9.5 (3.3-27.5)
Perceived Stress Level in The Last Month				
Good/Very Good (Reference)		1 (Ref)		1 (Ref)
Not good, not bad	.407	1.4 (0.6-3.3)	.638	1.2 (0.5-2.9)
Bad/Very Bad	<.001	7.1 (2.7-18.4)	.003	5.0 (1.7-14.3)
Anxiety				
Normal	-	-		1 (Ref)
Borderline	-	-	.032	3.6 (1.1-11.3)
Abnormal	-	-	.001	9.5 (2.6-34.4)
R²		0.595		0.643

*Only statistically significant variables given; Hosmer&Lemeshow χ2=12.513, df=8, p=0.130; Constant β=-7.162, p=<0.001; ****Binary Logistic Regression (Backward-Wald); RR: Risk Ratio; CI: Confidence Interval; R²: Coefficient of Determination; df: Degrees of Freedom.

Variables Included in Models;

Model 3: *Age, Place of Residence, Gender, Educational Status, Employment Status, Income Status, Smoking, Body Mass Index, Physical Activity, Comorbidity + Consumption of Caffeinated Beverages After 6.00 pm, Bedroom Lightning, Perceived Stress Level in The Last Month, Using Electronics Before Bed, Bed Type*

Model 4: *Model 3 + Anxiety, Depression*

DISCUSSION

In this study, 34.6% of participants reported poor SQ. According to TAPES, frequency of poor SQ was 21.8%.[10] In two studies conducted with people who applied to PHC in Ankara and İzmir, poor SQ prevalence were found to be 36.1%, 15.0%, respectively.[11,13] In population-based studies in Austria, Spain, Germany, Iran poor SQ prevalence were 32.1%, 38.2%, 35.2%, 37.0%, respectively, while unlike ours, a study in China among retirees reported as 53.0%.[14–16,18,28] Considering that SQ tends to worsen with age, difference can be explained by the higher average age of the study conducted in China compared to this study. Our rate was higher from TAPES in 2010 but similar to study in Ankara in 2021; which shows that poor SQ problem has increased over years and started to become a public health problem.

We found that with increasing age SQ gets worse (RR=1.07;95%CI=1.04-1.10). Likewise, studies conducted in İzmir, Nevşehir, Austria, Iran supports our findings.[11,12,14,28] In line with a population-based study conducted in Spain, age was directly related to poor SQ (RR=1.05;95%CI=1.03-1.06).[15] As getting older; frequent waking up at night, changes in sleep patterns, difficulty in falling asleep, decreased total time spent in sleep, light sleep

or chronic diseases (such as incontinence, chronic pain) occur and cause poor SQ.

In this study, being female was an independent risk factor for poor SQ (RR=5.1;95%CI=1.9-13.6). Our findings are in line with literature.[11,14,22,28] According to other studies conducted in China, Australia, Spain, Nevşehir, SQ was poorer in women, with an RR of 1.42 (95%CI=1.32-1.53), 1.53 (95%CI=1.23-1.90), 1.88 (95%CI=1.54-2.28), 2.31 (95%CI=1.55-73.46), respectively.[12,15,16,24] Also in TAPES, RR was 1.8 (95%CI=1.5-2.1) for women.[10] Women have more difficulty falling and staying asleep as well as being more prone to developing sleep disorders (such as insomnia, restless legs syndrome) than men. Moreover, hormonal changes due to pregnancy, menstrual cycle or menopause can cause insomnia in women, which explains the risk of poor SQ.

In our research, SQ was worse in those with low socioeconomic status (LSES) (low education level, income less than expenses, lower social class, living in semi-urban areas); risk was 2.9 times (95%CI=1.3-6.5) higher among those living in semi-urban areas. Similar to our results, according to a population-based study in China, poor SQ frequency was 1.1 times higher (RR:1.12;p=0.002) in those living in semi-urban areas than those living in urban areas.[29] As indicated in the report using the National Health Interview Survey 2020 data; in USA, percentage of adults having difficulty falling asleep increased as settlement became more rural, education and income level decreased; and the percentage of adults having difficulty staying asleep increased as income level decreased and settlement became more rural.[30] Based on studies conducted in İzmir and Ankara, SQ became more poorer with

lower income and education level.[11,13] A study with university students in Denizli found that SQ was 1.8 times (95%CI=1.2-2.6) worse in those with less income than their expenses.[23] Socioeconomic factors (such as income, education, employment status, environment) substantially shape people's sleep health; in LSES, individuals' sleep duration is insufficient and quality is poor. Not only do people with higher household incomes feel well-rested, but improved housing quality also leads to noticeable improvements in SQ. Furthermore, SQ may have been found to be lower because people in semi-urban areas were mostly women and shift workers, their anxiety-depression levels were significantly higher, and their socioeconomic levels were lower.

Multiple logistic regression model showed that shift/part-time working was associated with higher odds of poor SQ (RR=3.9;95%CI=1.1-14.0). In parallel with this study, studies conducted in England and Denizli found that shift work increased poor SQ risk by 2.5 (95%CI=1.6-3.7) and 4.9-times (95%CI=1.7-14.3), respectively.[31,32] Shift workers' sleep is oft interrupted; due to sleep-wake circadian rhythm misalignment, particularly in night shift workers, deep sleep times are shortened, thereby sleepiness occurs during day. Along with working-environment-related factors (such as noise, stress), SQ may have been found to be worse inasmuch as shift workers were mostly live in semi-urban areas and their socioeconomic levels were lower.

As stated in our results, negative lifestyle and health status (smoking, physical inactivity, overweight/obesity, chronic disease, low water consumption) were found to cause poor SQ; risk was 2.7-fold greater (95%CI=1.1-6.7) in smokers. Likewise, a study conducted in İzmir determined that SQ worsened with increase in BMI, also having chronic disease increased risk by 2.94 times (95%CI=1.04-8.32).[11] Conforming to study conducted in Ankara, smoking, having comorbidity, being physically inactive were risky in terms of poor SQ.[13] According to a study in Konya, university students' SQ deteriorated due to smoking, being physically inactive, having a health problem that prevents sleep.[21] A study in Denizli found that having chronic diseases worsened SQ, and smoking increased risk 1.5-times (95%CI=1.1-2.1), not doing physical activity 1.7-times (95%CI=1.3-2.2).[23] Based on a research in China, risk is 1.16-times more (95%CI=1.07-1.25%) in those with comorbidity, 1.14-times (95%CI=1.05-1.23) more in those who are physically inactive.[16] Another study in Australia noticed that smoking increased poor SQ risk (RR=1.8;95%CI=1.1-2.9), yet engaging physical activity three or more times a week was protective.[24] Physical activity may have had a positive effect on SQ, via making easy to fall asleep, increasing non-REM/REM sleep, and providing rest. Obesity, one of the leading causes of sleep apnea, and chronic disease-related symptoms namely dyspnea, frequent urination, and pain can cause poor sleep quality by often disrupting night sleep. Falling asleep difficulty owing to nicotine's stimulant effect and low total sleep time due to chronic nicotine intake explains poor SQ.

According to our results, SQ of those having negative sleep hygiene (consuming caffeinated beverages in late hours, sleeping with lights on, dealing electronic devices before bed, uncomfortable mattress) was poorer. Dim light at night increased risk by 6.0-fold

(95%CI=2.5-14.5), bright light increased 9.5-fold (95%CI=3.3-27.5); other than these variables wasn't significant in multivariate analysis. Similar to our results, according to a study in Konya, sleeping in an environment that is not dark enough and consuming high amounts of caffeine were associated with poor SQ.[21] Study conducted in Denizli stated that SQ was worse in those consuming more coffee/caffeinated beverages on weekly basis and using phone/tablet one hour before bed.[23] A research from South Korea reported that light exposure at night causes frequent awakenings, impairs sleep depth and stability.[33] Individuals with poor sleep hygiene oft fall asleep with lights on. Light is one of main synchronizers of sleep-wake cycle; in presence of light (including blue-light originating from phone/tablet/TV screens), secretion of melatonin, which is responsible for depth and quality of sleep, is inhibited, and even if people sleep, complete rest is not achieved owing to melatonin deficiency. Additionally, delaying bedtime because of using phone/tablet/TV can cause poor SQ.

Lastly, poor mental health (previously diagnosed psychiatric disorder, being stressed in last month and at work, abnormal anxiety and depression) was related to poor SQ; borderline anxiety increased risk by 3.6-times (95%CI=1.1-11.3), abnormal level anxiety by 9.5-times (95%CI=2.6-34.4), being stressed by 5-times (95%CI=1.7-14.3). Our findings are in line with other researches. Study conducted in Brazil found that adults with anxiety-depression had poor SQ and anxiety increased risk 1.32-times (95%CI=1.08–1.62).[22] In a study, SQ of those with previously diagnosed psychiatric disorders was 3.6 times poorer (95%CI=1.7-7.8).[12] In literature, a significant positive correlation has been shown between SQ and anxiety-depression.[21,34] Stress, depressive disorder, anxiety, mood changes such as fear, joy, sadness in daily life prevent falling asleep by causing people excessively think about their worries in bed and by causing tension. Also, dreams become more disturbing, sustainability of sleep is reduced, so sleep is often interrupted. Simultaneously, sleep deprivation and sleep pattern/quality disorder can also trigger anxiety. While sleep disorders and poor SQ can cause anxiety, depression and stress, poor SQ in cases of anxiety, depression and stress may also explain the relationship.

Limitations-Strengths

There are some limitations in our research. Firstly, due to COVID-19 pandemic and problems in obtaining permits for research, our study was not conducted at community level, therefore results should be interpreted cautiously. Second, the fact that participants contain only those who willing to participate in study may have caused subject bias. Using internationally valid scales to determine SQ and anxiety-depression level, carrying out the study in those consulting PHCs, collecting data by face-to-face interview technique, measurement of anthropometric features by researchers are the strengths of our research.

CONCLUSION

Poor SQ was found to be a continues common problem in society, with one out of every three people in our research.

Increasing age, being woman, low income/education level, living in semi-urban area, shift/part-time work, negative lifestyle factors and chronic disease, poor sleep hygiene and anxiety-depression were associated with an increased risk of poor SQ.

In order to improve SQ, health-promoting activities such as preventing obesity, increasing physical activity, preventing smoking, encouraging individuals to quit smoking and directing them to smoking cessation polyclinics should be arranged in primary care and workplace primary care (occupational medicine). Especially sleep patterns of elderly people, women, shift/part-time workers should be monitored more closely, counseling should be given during follow-up of chronic diseases, individuals should be referred to specialists when necessary.

Poor sleep hygiene and mental health were also important determinants; it is recommended to provide information under the leadership of primary care to increase sleep hygiene, to expand mental health services in primary care, and to refer stressed/anxious individuals to psychologists/psychiatrists in case of detection.

Future research may focus on identifying high-risk groups in terms of poor sleep quality, more detailed evaluation of sleep hygiene, and developing interventions to reduce stress and anxiety level and to improve sleep health, along with evaluating the efficiency of those interventions. Moreover, it may be beneficial for future studies to be community-based to identify other causes concerning poor sleep quality.

ACKNOWLEDGEMENTS

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ORIGINAL ARTICLE

Rising bribes: accessing public health services in Northern Cyprus during COVID-19

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Abstract

Objective: This study investigates the impact of the COVID-19 pandemic on informal payments (bribes) in accessing public health services. It assesses whether the pandemic increased informal payments and whether vulnerable populations, namely women, migrants, and low-income individuals, were more susceptible to bribery.

Methods: Data from pre-pandemic (2019) and pandemic (2021) Global Corruption Barometer surveys in Northern Cyprus were statistically analyzed to examine changes in informal payments and their associations with gender, income, and immigrant status.

Results: The study revealed a significant surge in informal payments for accessing public health services during the COVID-19 pandemic. In 2019, before COVID-19 pandemic, 4.70% of respondents reported paying bribes. However, in 2021, during COVID-19 pandemic, this figure spiked to 17.85%, with an odds ratio of 4.062 underscoring the magnitude of the increase. Moreover, during COVID-19 pandemic, women reported higher bribe rates (20.3%) compared to men (13.7%), migrants had substantially higher bribe rates (25.7%) than natives (15.7%), and individuals with lower incomes (25.6%) were more inclined to engage in bribery. Marginal effects, based on logistic regression estimation results, showed that migrants had a 9.63 percentage points higher likelihood of bribery, low-income individuals had a 12.57 percentage points higher probability, and being female was associated with a 9.05 percentage points higher chance of engaging in bribery.

Conclusion: This study highlights a troubling surge in bribery within the public health sector during the COVID-19 pandemic. Vulnerable populations, especially women, migrants, and low-income individuals, face increased risks. Urgent action is needed to combat corruption in healthcare during pandemics and ensure equitable access to healthcare services.

Keywords: COVID-19, Bribes, Public Health, Vulnerable Groups, Northern Cyprus

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INTRODUCTION

Healthcare, universally acknowledged as pivotal to productivity and happiness[1, 2], faces a pervasive issue of corruption in many countries, making it one of the most corrupt sectors.[3] This corruption obstructs the positive impact of health on well-being, often remaining unaddressed and covered in secrecy.[4]

Informal payments in healthcare, defined as payments for traditionally free services, pose a significant burden, particularly on economically disadvantaged segments: Transparency International's 2006 Global Corruption Report notes that these payments contribute to resource allocation distortion, favoring those who can pay over those in most need.[3, 5] The growing demand for essential health services prompts some to resort to informal payments, encouraging additional corrupt practices.[6] The COVID-19 pandemic intensifies this issue, straining the healthcare system and providing cover for the illicit procurement of funds by corrupt officials.[6]

This intensified corruption incentivizes officials to embezzle funds meant for high-demand but short-supply items, including vaccines, protective equipment, and therapeutic medicines. Vulnerable populations, such as those with underlying health conditions, living in poverty, or belonging to certain racial and ethnic minorities, suffer an increased risk of corruption. These groups may have limited healthcare access and work in jobs with a higher risk of COVID-19 exposure, forcing difficult choices between preventative actions and economic well-being.[7]

Informal payments in healthcare receive little emphasis in corruption research due to difficulty in identification. These payments, taking various forms like under-the-table payments, gifts, or favors, pose a challenge in research due to ambiguity in their intent.[8, 9] Central and Eastern European countries, inheriting informal payments from the former Soviet system, struggle with corruption reform, as socio-cultural values are deeply intertwined with these practices.[10, 11] The coexistence of formal and informal payments heightens addressing corruption reform challenges, burdening patients financially.[11]

Informal payments are often perceived as a necessity to fill financial gaps, especially in less developed countries, where a corrupt healthcare system provides some options. In some countries, patients see informal payments as a means to receive better or faster care for an additional fee.[12, 13, 14, 15]

Furthermore, when informal payments are expected, patients who cannot afford them face challenges in accessing treatment, experience reduced service quality, and encounter longer wait times. Poorer patients make significant sacrifices, and evidence suggests regressive payments, with the poor paying a higher proportion.[16] Research challenges the idea that payment levels depend on a patient's ability to pay. In Hungary, payment sizes are similar across income groups.[6] Transition economies show payment amounts are more determined by willingness to pay[17], emphasizing the regressive nature, as the poorest may have a greater willingness to pay due to limited healthcare access.[18]

This study aims to expand existing literature on how pandemics change informal payments in the public health sector. Additionally, it investigates whether specific vulnerable

groups—women, migrants, and individuals from low-income backgrounds—are more susceptible to informal payments than others. [6,7,16] It put forwards two hypotheses:

Hypothesis 1: *As access to public health services becomes increasingly challenging during a pandemic, bribe payments are likely to increase.*

Hypothesis 2: *As access to public health services becomes increasingly challenging during a pandemic, particularly for vulnerable groups (1) low-income individuals, (2) women, and (3) immigrants, they tend to make more bribe payments compared to others.*

The following methods section details the approach to evaluating hypotheses. The subsequent section presents findings, including survey data, chi-square tests, and logit regression model estimation results. The study concludes by discussing results and offering concluding remarks on research implications.

METHODS

To test these two hypotheses, we utilize micro-data from two Global Corruption Barometer surveys conducted in October 2019 [19] (pre COVID-19 pandemic) and November-December 2021[20] (during COVID-19 pandemic) in the northern part of Cyrpus. The North Cyprus Corruption Barometer 2019 and 2021 followed the Transparency International's Global Corruption Barometer (GCB) methodology. Specifically, to gauge the frequency of reported bribery in the public health system, this study focuses on responses to two questions from these surveys: 1) "Have you used the public health services in the past 12 months?"; and if so 2) "Have you ever had to bribe, give gifts or do favors in order to get the services you need at a public hospital or public health institution? If so, how often?" The 2019 survey was conducted by LIPA Consulting and the 2021 survey by Metron Analytics Services—both local survey companies in Nicosia, by utilizing CAPI method. In both surveys, there were 1,000 respondents over the age of 18. In Northern Cyprus, once a citizen reaches the age of 18, they are automatically included in the roster of eligible voters. Therefore, this roster serves as a reliable list that provides the number of citizens over the age of 18. Accordingly, given the official number of electorates of 198624 in the 2020 elections, both surveys have a significance level of 0.05 and a margin of error of +/-3.09%.

To test Hypothesis 1, we compare the frequency of bribe payments in 2019—before COVID-19 and 2021—during COVID-19, calculate the odds ratio, and provide relevant statistics. To test Hypothesis 2, we conduct two sets of analysis: 1) we ran chi-square tests to verify if there was a statistically significant relationship between bribery—"paying bribes" during COVID-19 pandemic and gender, income, and being immigrant or native; and 2) to determine the direction of these relationships between paying bribes gender, income, and being immigrant, we estimate the following logit regression model:

$$P(Bribery = 1\ (Yes)) = \frac{e^{\beta X}}{1+e^{\beta X}}, \qquad (1)$$

where *Bribery* is a dummy variable that takes the value of 0 for individuals who have never paid bribes and 1 otherwise; and the following are the explanatory variables (X): *Migrant* is 1 for those who were not born in Cyprus, 0 otherwise; *Poor* is 1 for those who were

either 'barely getting by', "need to borrow to purchase the things they need' or 'can't afford to buy anything they need'; *Female* is 1 for those who answered gender question as women; *Education* takes a value between 0 and 6—for illiterate 0, elementary school 1, middle school 2, high school 3, university 4, masters 5, and doctorate 6; *Age* takes a value between 1 and 6—1 for 18-24, 2 for 25-34, 3 for 35-44, 4 for 45-54, 5 for 55-64, and 6 for 65 and above; and *City* is 1 for those living in a city and 0 otherwise.

RESULTS

Table 1 provides a summary of the demographics of survey respondents conducted from November to December 2021, during Covid-19 pandemic. Among those who answered relevant questions, 14.1% were migrants, 32.8% were classified as poor, and 48.7% were females. The majority of respondents (53.5%) had university education. Regarding age distribution, the majority falls between the ages of 35 and 44 (29.3%), followed by those aged 25-34 (21.8%). Additionally, 61.1% of the respondents were living in a city.

Table 1. Demographics of public health service recipients during the COVID-19 pandemic

Variable	Frequency	Percentage (number of respondents who answered the relevant question)	
		%	n
Migrant	70	14.1	497
Poor	160	32.8	488
Female	236	48.7	485
Education			
Elementary school	33	6.6	497
Middle or high school	97	19.5	497
University	266	53.5	497
Graduate school	101	20.3	497
Age			
18 – 24	71	14.3	495
25- 34	108	21.8	495
35 – 44	145	29.3	495
45 – 54	93	18.8	495
55 – 64	48	9.7	495
65 and over	30	6.1	495
Living in a City	304	61.2	497

In the 2019 survey, 517 out of 1000 respondents used public health services. As presented in Table 2, among these respondents, only 4.70% either reported paying bribes or did not answer the question. However, in the 2021 survey, out of 497 respondents who used public health services, this percentage reached 17.85% of the respondents.

Table 2. Frequency of bribe payments for accessing public health services in Northern Cyprus: Before and during COVID-19 pandemic

	2019 Before COVID-19		2021 During COVID-19		Difference (%)
	Frequency	Percentage	Frequency	Percentage	
Never	492	95.2	412	82.9	*12.30*
Once or twice	15	2.9	42	8.5	*-5.60*
More than once or twice	3	0.6	10	2.0	*-1.40*
Very often	5	1.0	6	1.2	*-0.20*
Don't know	2	0.4	27	5.4	*-5.00*

An odds ratio of 4.0602 (z-statistic = 5.909, p < 0.0001) was calculated to compare the odds of bribe payments before the COVID-19 pandemic to those during the pandemic, revealing a statistically significant association. This indicates that the odds of paying bribes for health services were approximately four times higher during the COVID-19 pandemic. The substantial increase in bribe payments provides strong evidence supporting the claim that, during the pandemic, bribe payments significantly increased.
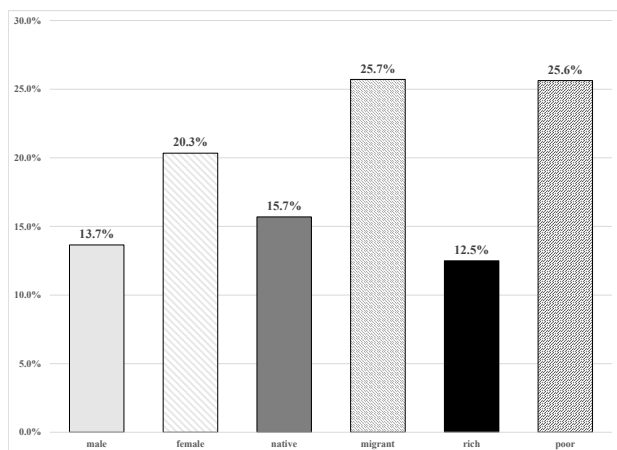

Figure 1. Bribe payments for accessing public health services in Northern Cyprus during COVID-19 pandemic by different groups

When comparing differences in bribe payments during the pandemic, based on gender, nativity, and income, significant disparities become apparent. As is presented in Figure 1, females report a higher rate of bribe payments (20.3%) compared to males (13.7%), suggesting a greater inclination for females to engage in bribery. Migrants also stand out with a notably higher rate of bribe payments (25.7%) compared to natives (15.7%), indicating a pronounced propensity for bribery among migrants. Furthermore, individuals with lower incomes (25.6%) are more likely to partake in bribery than those with higher incomes (12.5%). In summary, the data underscores substantial differences in bribery rates among distinct demographic groups. Gender disparities are evident, with females more likely to report making bribe payments. Additionally, the data highlights an elevated tendency for bribery among migrants compared to natives. Furthermore, individuals with lower income levels exhibit a significantly higher likelihood of engaging in bribery than their more affluent counterparts. These findings offer valuable insights into the dynamics of bribery within various population segments.

Table 3. Contingency table of bribe payments for accessing public health services in Northern Cyprus during COVID-19 pandemic

Bribe payment		Gender		Nativity		Income	
		Male	Female	Native	Migrant	Rich	Poor
No	n	215	188	360	52	287	119
	%	86.3	79.7	84.3	74.3	87.5	74.4
Yes	n	34	48	67	18	41	41
	%	13.7	20.3	15.7	25.7	12.5	25.6
Total		249	236	427	70	328	160
		$\chi^2 = 3.853$		$\chi^2 = 4.261$		$\chi^2 = 13.251$	
		$p < 0.05$		$p < 0.05$		$p < 0.01$	

Table 3, the contingency table, displays the observed frequencies of bribe payments based on 1) Gender (Female, Male); 2) Nativity (Migrant, Native); and 3) Income (Poor, Rich), as well as chi-square statistic (χ^2) and the associated p-values. Significant chi-square values indicate a statistically significant relationship between paying bribes and gender, income, and immigrant status.

Table 4. Logistic regression model estimation results for the probability of paying bribes

	Odds ratio	Std. err.	[95% conf. interval]	
Migrant	2.089	0.688	1.096	3.982
Poor	2.614	0.699	1.548	4.414
Female	1.998	0.529	1.189	3.357
Education	1.235	0.176	0.933	1.634
Age	0.951	0.095	0.782	1.156
City	1.219	0.322	0.726	2.046
Constant	0.038	0.030	0.008	0.176
No of Obs	477			
LR χ^2 (6)	23.78			
Prob > χ^2	0.0006			

As is presented in Table 4, the logistic regression results indicate the following: Migrants have 2.09 times higher odds of bribe payment than non-migrants ($p < 0.05$). Poor individuals show a substantial increase with 2.61 times higher odds ($p < 0.01$). Females exhibit 1.99 times higher odds compared to males ($p < 0.01$). Education, with an odds ratio of 1.23, lacks statistical significance ($p < 0.15$). Age and city are non-significant.
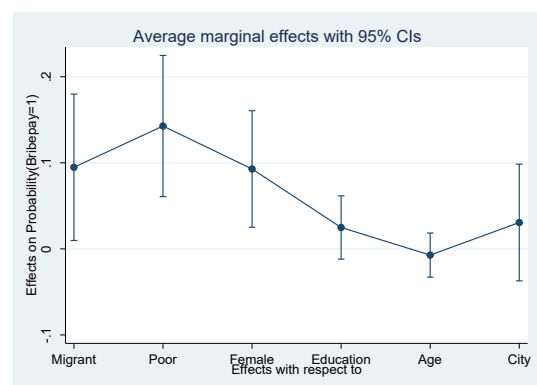
Figure 2. Marginal effects of different demographic characteristics on probability of paying bribes with 95% confidence intervals

Finally, the delta-method is employed to calculate the marginal effects of different factors on the predicted probability of bribery. Accordingly, as is presented in Figure 2, being a migrant is associated with a statistically significant increase (0.0963) in the predicted probability of bribery compared to non-migrants ($p < 0.05$). Similarly, individuals classified as poor exhibit a substantial and highly significant increase (0.1257) in the likelihood of bribery compared to those not classified as poor ($p < 0.01$). Gender also plays a significant role, with females showing a higher predicted probability of bribery (0.0906) compared to males ($p < 0.01$). However, the effects of education, age, and city residence are not statistically significant ($p = 0.138$, $p = 0.611$, $p = 0.453$, respectively). These findings underscore the heightened vulnerability of migrants, individuals in poverty, and females to corrupt practices in the public healthcare sector, providing valuable insights into the demographic dynamics of bribery.

DISCUSSION

Our study delves into the dynamics of informal payments within the public healthcare sector, with a specific focus on the ramifications of the COVID-19 pandemic on bribery tendencies and the susceptibility of distinct demographic groups.

The literature explains the pervasive nature of corruption in global healthcare systems, emphasizing the adverse impact of informal payments on resource allocation and equitable access to health services. Our study extends this discourse by scrutinizing how the prevalence of informal payments evolves at the individual level, especially in the context of a pandemic. The observed upswing in bribe payments during the COVID-19 pandemic resonates with broader literature suggesting that corruption tends to thrive during crises. [6, 7, 13, 14] It appears that the pandemic, characterized by heightened demand for health services and strained systems, provides fertile ground for the exacerbation of corrupt practices within the public health sector.

Our findings align with existing research emphasizing the regressive nature of informal payments, highlighting that vulnerable populations, including low-income individuals, women, and migrants, bear a disproportionate burden. [7, 16, 17]

Our study provides robust evidence of a significant increase in bribery during the pandemic. The odds ratios and logistic regression results corroborate the statistical significance of this surge. Notably, the marginal effects analysis dissects the impact of demographic characteristics on the likelihood of engaging in bribery, highlighting the distinct vulnerabilities of migrants, low-income individuals, and women. These results underscore the complex interplay between corruption, socioeconomic factors, and healthcare access.[17]

While our study sheds further light on these issues, limitations exist. We focused on a specific population in Northern Cyprus, and our sample size of around 1,000 respondents may limit generalizability to diverse global settings with varying cultural norms. Survey data introduces response and recall biases, potentially leading to underreporting of bribery. Moreover, our concentration on specific vulnerable groups might overlook others, and the study lacks a qualitative understanding of bribery motivations. Despite these limitations, our study emphasizes the urgency of addressing corruption in

healthcare reform efforts, particularly considering its potential negative impact on vulnerable groups.[16, 17, 18]

The governance in the northern part of Cyprus has been weak and deteriorating.[21] The decline in the Transparency International Corruption Perception Index score from 40 in 2017 to 28 in 2021 and further to 27 in 2022 is indicative of a rising trend in corruption within the northern part of Cyprus. Concurrently, the country's ranking has experienced a significant drop, falling from 81st place in 2017 to 140th place in both 2021 and 2022.[21] Research indicates that informal payments are most prevalent in countries with weaker governance.[22, 23] Therefore, comprehensive, people-centered policies are crucial, with a focus on alleviating the burden on vulnerable populations. However, formalizing informal payments should be approached with caution, as it can increase costs and disproportionately affect vulnerable individuals.[17] Informal payments often persist despite formal charges, emphasizing the complexity of the issue.[3]

The public health system in the northern part of Cyprus confronts challenges on both the supply and demand sides, encompassing issues of accessibility, quality of care, and inefficiencies within healthcare institutions.[24, 25, 26, 27] The public healthcare system is accessible to individuals with social security insurance and their dependents, offering free use of accident and emergency departments for everyone.[24] However, despite a preference for government hospitals, issues such as patient dissatisfaction, prolonged waiting times, and discontent among doctors drive patients towards private hospitals.[25] The persistence of poor service quality is evident, emphasizing a lack of structure

and the employment of underqualified personnel.[26] Additional problems highlighted include financial incapability, long waiting lists, a lack of medical equipment and instruments, an inadequate number of personnel in the hospitals' cleaning, kitchen, and service sections, disinterested staff, insufficient staffing levels, the absence of well-established security systems in hospitals, and limited opportunities for patients to choose their preferred doctors.[26] Furthermore, it is documented that public hospitals lacked systematic data collection about inpatient needs, service quality, and inpatient complaints.[24, 27] Accordingly, addressing both demand and supply-side factors within the healthcare system, such as resource imbalances, low salaries, lack of accountability, inadequate government oversight, and transparency, is critical.[3, 28] Strengthening patients' rights and increasing healthcare providers' salaries can help reduce informal payments.[3, 10, 29] Engaging the public and transparent community dialogues are vital to tackling the issue at the grassroots level.[30] Transparent data on informal payments can raise awareness and generate political will.[31, 32] Reducing informal payments necessitates addressing demand-side factors like expectations, fears, cultural norms, and distrust in the healthcare system.[18]

CONCLUSION

Our research contributes valuable insights for both academic and policy-oriented discussions on corruption in the public health sector. As the global community grapples with the repercussions of the pandemic, our findings underscore the pressing need to address corruption in healthcare reform initiatives. Policymakers and stakeholders are

urged to prioritize interventions that foster transparency, equity, and accountability within health systems, with a specific focus on alleviating the disproportionate burden faced by vulnerable demographic groups.

Moving forward, further research and targeted interventions are imperative to foster fair and accessible healthcare services, particularly during times of crisis, and to confront the multifaceted challenges posed by informal payments. The distinct vulnerabilities uncovered in our study should inform future policy decisions aimed at creating a more resilient and equitable healthcare system, free from the shackles of corruption.

ACKNOWLEDGEMENTS

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SHORT REPORT

Gender-role attitudes of university students: a cross-sectional study from Türkiye

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Abstract

Objective: This study aimed to determine the attitudes of freshmen university students from different faculties of the same university towards gender-roles and to analyse the effect of their socio-demographic characteristics and studying in different faculties on these attitudes.

Methods: The cross-sectional study was conducted with the participation of 1080 students studying in the first year of five different faculties of Erciyes University between January-February 2020. The data were collected via face-to-face interview method, using a questionnaire including "Gender-Roles Attitude Scale (GRAS)" and sociodemographic characteristics of the students. In the analysis of the data, frequency, percentage and mean values were used for descriptive statistics, and Pearson chi-square, one-way ANOVA test and T-Test were used for comparative analysis.

Results: The mean GRAS score of the students was 147.7±27.7. While medical students had the highest GRAS scores,Theology students were found to havesignificantly lower scores compared to all groups. Amongsociodemographic characteristics,being female, mother'slevel of higher education and nuclear family were found to be associated with higher scale scores, while low economic level and having only mother or father as the decision-maker in their family were found to be associated with lower scale scores.

Conclusion: Increasing the education levels and employment rates of women will contribute to the development of egalitarian gender-role attitudes of individuals. In order to reveal the effect of religion on gender roles more clearly, there is a need for new studies that will enable more detailed analyzes to be made.

Keywords: Gender Role, University Students, Gender Role Attitudes

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INTRODUCTION

While 'sex', as a biological concept, refers to the genetic, biological, physiological characteristics and differences that a person possesses as a woman or a man, 'gender' refers to the values and judgments of how society considers, accepts, and perceives men and women, as well as expectations of society from men and women[1]. Gender roles include the behaviours (roles) and social factors that are culturally appropriate for women and men[1].

Attitudes towards gender-roles are divided into two as egalitarian and traditional attitudes. In the egalitarian attitude, roles are shared equally between men and women in their family, social and professional lives. Nevertheless, in the traditional attitude; in addition to being primarily responsible for household chores and family-related matters, it is appropriate for women to be employed in a lower status, earn less income, and have a lower level of education than men. In societal life, women are expected not to go out alone in the evenings, and in family life, women are expected to keep it confidential if they are subjected to violence by their spouses, to take care of children, cleaning and other similar tasks at home. In marriedlife, women are assigned roles such as not engaging in sexual intercourse before marriage, and raising their status by giving birth to male children. Men, on the other hand, are expected to provide for their families, to perform physically demanding tasks at home, to protect and care for their spouses and children emotionally, and to be emotionally stronger, courageous, tough, and rational.

The best indicator of whether these gender stereotypes, which are widespread in society today, will continue in the future is the evaluation of young people's thoughts on this issue. Certain studies conducted to investigate the attitudes of university students towards gender role showed that whilemale students had more traditional views about working life and married life, students from both genders had more egalitarian views about social life and family life[2]. In a study conducted with university students in Türkiye; predictors that affect students' gender-role attitudes were defined as gender, department of education, parents'education levels, income levels, family types, and employment status of the mother[3]. In addition, studies have emphasized that the adoption of traditional gender-roles in students increases the possibility of approval of physical violence, and that students studying in medical fields have more egalitarian attitudes than those studying in other departments[3].

One of the remarkable determinants of gender-role attitude is religion. It is stated in many religions, including Christianity and Islam, that a woman's primary responsibility is to take care of her husband and children and that they are often considered to beless-valued than men. Although it is known that there are ideas to support equality in terms of religion, it is generally claimed that these philosophical and religious arguments do not support such equality[4].

University education is defined as an important milestone for young people. The first year of higher education is a period in which the support provided by family and close friends are suddenly cut off, students acquire important new ideas and experiences challenging their previous knowledge and beliefs, and develop new attitudes where they

gain self-determination, problem-solving skills and behaviors.In the literature review, when the GRAS scores of first-year university students were compared to those of upper-class students, no difference was found between students' grades and GRAS scores[5,6].

In this study, it is aimed to evaluate the gender-role attitudes of the students studying in the first year of different faculties of the same university and the factors that may be related to these attitudes.

METHODS

This descriptive, cross-sectional study was planned to be conducted with first-year students studying at five different faculties (Law, Medicine, Theology, Communication and Education) of Erciyes University (Kayseri, Central Anatolia, Türkiye) who are expected to have different gender role attitudes. The population of the research consisted of 1485 students studying in the first year of these five faculties. Sample calculation was not made for the research, it was planned to include the entire universe in the study.

A questionnaire consisting of two parts and 61 questions was applied to the students who volunteered to participate in the research. On the day the study was conducted, the students were visited in their classrooms, and they were informed about the study. The questionnaire forms were distributed to those who volunteered and collected back after 20 minutes. Students who were not in the classroom that day were excluded from the study. While the first part of the questionnaire consists of 23 questions about the students and their families' sociodemographic characteristics and genderism, the second part consists of the Gender-Roles Attitude

Scale (GRAS) developed by Zeyneloğlu et al.[7] The five-point Likert type scale consists of 38 questions. For the students' egalitarian attitude statements regarding gender roles (1, 4, 8, 12, 13, 18, 19, 20, 21, 22, 26, 27);5 points are givenif the answer is'strongly agree'; 4 points if 'agree'; 3 points if 'neither agree nor disagree'; 2 points if 'disagree'; and 1 point if the answer is 'strongly disagree'. However, the traditional attitude statements regarding gender roles (2, 3, 5, 6, 7, 9, 10, 11, 14, 15, 16, 17, 23, 24, 25, 28-38) were scored in the opposite way to the above-mentioned scoring. According to this results of scoring, the highest score to be obtained from the scale is 190, while the lowest score is 38. While a high score from the scale indicates that the student is close to adopting an egalitarian attitude towards gender roles, a low score indicates that the student is close to adopting to the traditional attitude towards gender roles[7].

Ethical approval from the Erciyes University Clinical Research Ethics Committee (No:2020/124 Date:12.02.2020) and administrative permissions from the deans of the relevant faculties were obtained for the research.

The research was completed with the participation of 1080 students studying in the first year of five faculties (the rate of reaching the universe: 72.7%). 320 students who were absent on the day of the study and 85 students who did not agree to participate in the study were excluded from the study.

SPSS version 25 package program was used to analyse the data. The conformity of the data to the normal distribution was examined with the kurtosis-skewness values and histogram, and it was observed that they were normally distributed. Descriptive data were expressed

in numbers and percentages. Pearson chi-square was used to compare categorical data, and one-way ANOVA test and T Test were used to compare numerical data. Games-Howell analysis was used in the post hoc analysis since the variances were not homogeneous. The value of p<0.05 was considered significant in statistical analysis.

RESULTS

Of the students, 30.1% weremedical students, 60.2% were women, 97.3% were single, 76.4% had spent most of their lives in the city centre, and 50.6% were living with their families (Table 1). 53.8% of the students expressed their economic status as medium. While 29.5% of the students' mothers were primary school graduates, 22.9% were high school graduates, 22.7% higher education graduates, and 43.1% of the students' fathers were higher education graduates (Table 1). 70.6% of the students' mothers were housewives.

The mean of the students' GRAS scores was 147.7±27.7 (min= 43, max= 190), and it can be said that the students were closer to the egalitarian attitude in general.

Table 1. Comparison of students' sociodemographic characteristics and GRAS scores			
Characteristics (n=1080)	n	%	Mean ±SD
Gender			
Male	430	39.8	137.3±26.8
Female	650	60.2	154.5±26.2
Marital status			
Not married	1051	97.3	147.8±27.9
Married	29	2.7	140.8±19.4
Longest lived place			
Urban	825	76.4	147.7±28.6
Rural	255	23.6	147.7±24.9
Economic status of the family			
Good	459	42.5	148.1±29.1
Moderate	581	53.8	148.1±26.2
Bad	40	3.7	135.0±31.1
Mother's educational status			
Less than high school	588	54.4	144.7± 27.3
High school and more	492	45.6	151.2±27.8
Father's educational status			
Less than high school	343	31.7	146.2±24.9
High school and more	737	68.3	148.3±28.9
Family type			
Nuclear	977	90.5	148.2±27.6
Not nuclear	91	8.4	141.0±27.1
The person who makes the decisions in the family			
Only mother or only father	314	29.1	138.8±28.5
Together	766	70.9	151.3±26.6

p-values (grouped):
- Gender: **p<0.001**
- Marital status: p=0.066
- Longest lived place: p=0.996
- Economic status of the family: **p=0.013**
- Mother's educational status: **p<0.001**
- Father's educational status: p=0.214
- Family type: **p=0.016**
- The person who makes the decisions in the family: **p<0.001**

Table 1. (countinued) Comparison of students' sociodemographic characteristics and GRAS scores

Faculty *	n	%	
Medicine [a]	325	30.0	153.1±27.6
Law[b]	157	15.0	145.4±25.6
Theology[c]	120	11.0	137.5±20.0
Communication[ab]	162	15.0	148.3±25.1 *p<0.001*
Education[b]	316	29.0	146.7±31.3
Total	**1080**		**147.7**±27.7

T-test was used for dual comparisons, one-way Anovawas used for triple and more comparisons.
*Different letters indicate significant difference between groups. Games-Howell analysis was used in the post hoc analysis.

Among the socio-economic characteristics, being female, mother's higher education level, and having a nuclear family were associated with higher scale scores, while low economic status and having only the mother or the father as the decision-maker in the family were associated with lower scale scores (Table 1).

There was a significant difference between the students' faculties and GRAS scores. In post hoc tests; it was observed that the students studying in the faculty of theology got lower scale scores than the other students (Table 1).

Although the GRAS scores of the students who answered 'male' to the question 'Which gender would you like your children to have?' were found to be lower, the difference was not significant. While female students stated more often than male students that 'they are afraid of gender inequality', 'they were exposed to gender inequality' and 'there is no gender equality in education in Türkiye', male students stated more often than female students that 'gender is important in career planning'(Table 2).

Table 2. Comparison of the students' answers to genderism questions with their genders

Question	Gender			
	Male*		Female*	
	n	%	n	%
Do you think there is gender equality in your own family?	295	68.6	415	63.8
	p=0.107			
Have you received any gender related education?	133	30.9	161	24.8
	p=0.026			
Do you think there is gender equality in education institutions in Türkiye?	211	49.1	263	40.5
	p=0.005			
Have you been exposed to gender inequality at any point in your life?	152	35.3	371	57.1
	p<0.001			
Are you afraid of facing gender inequality in your career?	156	36.3	452	69.5
	p<0.001			
Do you think gender is important in choosing a career?	264	61.4	295	45.4
	p<0.001			

*: 'Yes' answers are shown as numbers and percentages, Chi-square test was used for the analysis

DISCUSSION

In this study, gender-role attitudes and related factors of first year students studying in five different faculties of a university were evaluated.

Students' mean GRAS score of was found to be

147.7±27.7 at the study. When compared with similar studies in the literature conducted on university students, it is noteworthy that the students' mean GRAS score was higher[5, 8,9]. Zeyneloğlu et al. claimed that getting a score of 95 or higher on the scale can be interpreted as an egalitarian attitude[7]. Accordingly, it can be said that the students who receive higher education have egalitarian gender role attitudes.

In the study, female students' GRAS scores were found to be higher than those of male students'. Many studies in the literature support that women's gender perceptions and gender-role attitudes are more egalitarian[2,8]. The reasons for the difference between gender perceptions and attitudes of women and men may stem from the fact that the roles assigned to men provide them with advantages. Situations such as violence, to which women are exposed, may reactively lead them towards an egalitarian attitude.

No relationship was found between the place where the students lived for the longest time and their gender attitudes in the study (Table 1). There are also studies that reported no relationship between the students' GRAS scores and their place of residence as supported by this very research[5]. The development status and socio-cultural structure of the place where they live are undoubtedly effective on individuals. In this study, because the places students live were not analysed in detail, there might not have been any relationship between the place the students live and their GRAS scores.

In the study, while it was found that the GRAS scores of the students whose mothers had higher education levels were higher, no relationship was found between their fathers'

education level and their GRAS scores (Table 1). Although there were different claims in the literature between the individuals' fathers' education level and their gender-role attitudes, individuals' mothers' having higher education and being employed were usually associated with a more egalitarian gender role attitude[3,6]. It can be stated that increasing women's education levels and employment rates will contribute to the development of egalitarian gender-role attitudes of individuals.

It has been observed that students with nuclear family structure have a more egalitarian gender role attitude (Table 1). Different results were obtained in different studies comparing family structure and gender role attitudes[3,6]. The differences of individuals in nuclear family and extended family structures may explain this effect. For example, there are higher rates of employed mothers in nuclear families. Therefore, as mentioned above, mothers' being employed were usually associated with a more egalitarian gender role attitude[3,6]. In extended families, however, the number of elderly individuals is higher, and as age progresses, the perception of gender attitudes may change. In a study conducted with healthcare professionals, it was observed that those over 35 got higher scores from GRAS, but it should be noted that this study did not include the elderly as it was conducted only on active workers[8].

In the literature, gender related education has been found to be effective in the development of gender-role attitudes contrary to ours[6]. Ergin et al. found that medical school students who participated in gender related education had more egalitarian gender-role attitudes than those who did not[6]. The fact that gender education was not questioned in terms of

content, trainers, methods, etc. in the study may have caused the education to appear ineffective.

In the study, it was observed that the mean GRAS scores of the students with low economic status were lower. However, different results have been reported on this subject in the literature. In addition to studies reporting that middle-income people have the highest mean GRAS scores[3], there are also studies reporting that those with lower economic status have higher mean GRAS scores[5].

It was observed that the mean GRAS scoresof the students who grew up in families where family members made decisions together was higher than thoseof the students who grew up in families where decisions were made by a single parent. This result suggests that family relations and parental behavior models are effective in the development of young people's gender role attitudes.

The mean GRAS score of students studying in medical school was higher than other students (153.1±27.6) (Table 1). In the study by Ergin et al.[6] on medical students, the mean GRAS score of the students was 158.7±21.7, similar to our study. Uçar et al.[3] found that the GRAS scores of undergraduate students in the field of health were higher than other faculties. It can, therefore, be stated that the gender-role attitudes of those educated in the field of health are more egalitarian. In the study, the mean GRAS score of theology students were found to be significantly lower than those of other faculties (Table 1). As in many areas of social life, the teachings of religion have also taken a great place in the production and reinforcement of the roles of gender. Belonging to different religious belief systems, different interpretations and applications of religious

rules are held responsible for individuals' different perspectives on gender[10]. The reinforcing effect of religion on traditional gender stereotypes is controversial in the literature. There are also studies showing that tradition is more effective than religion in maintaining existing gender norms[9]. In addition, there are studies indicating that female students of Theology Faculty are inconsistent and undecided on many issues related to gender and have both traditional and modern approaches[10].

Limitations

The study was conducted in only one university and its results cannot be reflected to all university students. However, the study was conducted on 1080 students from five different faculties and provided the opportunity to compare the gender-role attitudes of university students studying in different faculties.

CONCLUSION

University students had generally egalitarian gender-role attitudes, but the GRAS scores of theology faculty students were lower than the others. Being awoman, having a mother with higher education level and being a member of a nuclear family were associated with a more egalitarian attitudes; nevertheless, low economic level and having a family with only one decision maker (mother or father) were associated with less egalitarian attitudes. Increasing women's education levels and employment rates will contribute to the development of egalitarian gender-role attitudes of individuals. In order to reveal the effect of religion on gender roles more clearly, there is a need for new studies that will enable more detailed analyses to be made.

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TECHNICAL NOTE

Future perspectives for strengthening the tobacco industry fight indicators

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Abstract

The tobacco industry, as a "commercial" determinant of health, uses various tactics to increase the number of smokers at the global level. Governments, with the support of the tobacco control community, should focus on reversing the tobacco endgame. Watching out for industry manipulations with objective and well-known tools might be helpful. Although WHO-MPOWER is a frequently used assessment tool to define the tobacco control capacity of the countries, it may not give "objective" messages to assess the situation of tobacco industry interference. On the other hand, the Global Tobacco Industry Interference Index (GTIII) is a better indicator to understand and emphasize the tobacco industry interference. Comparing these two assessment tools might be helpful in deciding which one to use. In this regard, we aimed to compare selected countries' tobacco control status using MPOWER and GTIII indicators. Data from twenty-four countries were included in the study. We found that a country that fully covers the MPOWER criteria can be open to industry interference based on the GTIII values. This discrepancy highlights the need for more comprehensive tools to assess the status of tobacco interference. Besides the current ones, the development of new indicators with a transdisciplinary approach might also be helpful in the tobacco endgame.

Keywords: Tobacco Industry, Tobacco Control, Tobacco, MPOWER, Global Tobacco Industry Interference Index (GTIII), Age-standardized Estimates of Tobacco Use

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INTRODUCTION

As a global health threat, the tobacco industry (TI) is known to be a commercial determinant of health[1]. The global tobacco control community and the governments have crucial roles in taking preventive actions against TI.

As the World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC) Article 5.3. targets to eliminate the harms of the TI, watching TI might be helpful to be proactively responsive to the threats. In this regard, we have practical tools which we can use to watch TI. As a strategy tool, the MPOWER document pointed out the importance of TI struggle when developed in 2008.[2] A more recent tool is the Global Tobacco Industry Interference Index (GTIII).[3] It is used to assess the interference level of the TI in tobacco control activities in a country. Somehow, it gives an idea to understand the implementation of the WHO FCTC Article 5.3 capacity of the country. Despite the availability of these tools, various missing points in assessing the TI interference still exist. In this paper, we aimed to discuss the missing points of the current TI interference indicators and to emphasize the need for the development of new indicators for a stronger tobacco industry fight.

METHODS

Items of the MPOWER strategies linked with TI interference and the GTIII values have been used for the selected countries in this study. MPOWER values were included for the years 2007, 2019 and 2020. GTIII ranking was included for 2021 (Table 1). The GTIII was obtained from the "Global Tobacco Industry Interference Index 2021", and the MPOWER scores were obtained from "The Tobacco Atlas" and "World Health Organization, The Global Health Observatory". Also, tobacco consumption values were obtained from "Age-standardized estimates of current tobacco use, tobacco smoking and cigarette smoking data, The Global Health Observatory, World Health Organization .[3,4,5,6]

MPOWER measures aim to assist in the country-level implementation of effective interventions to reduce tobacco demand contained in the WHO FCTC. The MPOWER measures include six steps: "M"- Monitor tobacco use and prevention policies, "P"- Protect people from tobacco smoke, "O"- Offer help to quit tobacco use, "W"- Warn about dangers of tobacco, "E"- Enforce bans on tobacco advertising, promotion and sponsorship, and "R"- Raise taxes on tobacco.[2] Among the six, step "E" is thought to have a strong link with the tobacco industry.

The GTIII shows the interference level of the industry in tobacco control activities. In other words, the indicator is believed to show how a government is "realistic" in the implementation of WHO FCTC Article 5.3. The GTIII 2021 is based on publicly available information on tobacco industry interference in 80 countries and their respective governments' responses to this interference. The lower the index score, the lower the tobacco industry interference level.[3]

The comparisons have been done by using the data of the countries with the lowest (n=10) and the highest (n=10) GTIII scores in 2021. In addition, data for Brazil and Türkiye, which WHO stated as the only two countries to fully implement all the MPOWER measures at the highest level of success, were also examined. Countries with four big tobacco companies (USA, UK, Japan and China) were included

in the list. In conclusion, 24 countries were evaluated.

FINDINGS

As seen in Table 1, the indicators do not define a clear position for the country to reflect the 'current' situation against TI. For example, Brunei Darussalam (BD) seems to be the best at blocking TI. Nevertheless, the consumption frequency in BD is not the lowest on the list. In France, although the level of industry interference is low and the percentage of compliance with advertising bans is high, the frequency of tobacco consumption is high. The TI interference level is high in both Brazil and Türkiye, which are seen as the most successful countries to implement MPOWER strategies. The Dominican Republic, which has a high level of TI interference and is insufficient to implement the bans on tobacco advertising, promotion, and sponsorship, has one of the lowest frequency of tobacco consumption. Uganda and Palau increased their MPOWER scores. Although MPOWER scores in Türkiye, Argentina, and Georgia increased, three countries still had low GTIII scores.

Table 1. GTIII ranking, compliance with three dimensions of MPOWER including compliance with adv bans, enforce bans on tobacco adv, and tobacco consumption in selected countries.

Country name and GTIII ranking of the country (2021)[3]	MPOWER components			
	Compliance with advertising bans (%)[4*]	Enforce bans on tobacco advertising, promotion and sponsorship, 2020[5**]	Enforce bans on tobacco advertising, promotion and sponsorship, 2007[5**]	Tobacco consumption (%) (WHO, 2019)[6]
1.Brunei Darussalam	High	4	4	16.2
2.New Zealand	High	4	4	14.2
3.UK	Not available	4	4	16.1
4.France	High	4	4	33.6
5.Uganda	Medium	5	2	8.9
6.Netherlands	High	4	4	22.6
7.Mongolia	High	5	4	29.6
8.Kenya	High	5	5	11.5
9.Iran	High	5	5	14.0
10. Palau	High	4	2	17.9
43. Brazil	High	5	4	13.2
62. Türkiye	Medium	5	2	30.9
68. China	High	4	4	25.7
68. USA	Not available	2	2	23.4
71. Argentina	High	4	2	24.9
72. Zambia	Not applicable	2	2	14.6
72. Jordan	Moderate	5	4	34.6
74. Romania	High	4	4	28.4
74. Italy	High	4	4	23.3

Table 1. (Continued) GTIII ranking, compliance with three dimensions of MPOWER including compliance with adv bans, enforce bans on tobacco adv, and tobacco consumption in selected countries.

76. Georgia	High	4	2	31.7
77. Indonesia	Not applicable	2	2	37.2
78. Japan	Not applicable	2	2	20.5
79. Switzerland	Medium	2	2	25.7
80. Dominican Republic	Not applicable	2	2	10.9

* Data was taken before the site (https://tobaccoatlas.org) was updated.

** 1 = Data not reported, 2 = Complete absence of ban, or ban that does not cover national television (TV), radio and print media, 3 = Ban on national TV, radio and print media only, 4 = Ban on national TV, radio and print media as well as on some but not all other forms of direct and/or indirect advertising, 5 = Ban on all forms of direct and indirect advertising.

In brief, using only these indicators may not give us the opportunity to objectively assess the TI status.

COMMENT

The tobacco industry is almost the major obstacle in achieving tobacco control. Today, very close follow-up and proactive blowback interventions are needed to make the struggle against the TI 'realistic'. Monitoring the trends and invasion levels of the TI can be helpful in this regard. However, the WHO-MPOWER strategy document is basically assessing the tobacco demand side and is almost inefficient in assessing in a comprehensive and permanent approach.

Although WHO-MPOWER strategies have been used for many years to follow up and compare different aspects of tobacco control, it seems, they are not 100% sufficient to reveal the supply needs of tobacco control including interference of the TI. New indicators meeting these missing points are recommended to be developed with the aim of **#endgame**. The Global Tobacco Industry Interference Index is one of the recent tools which has been developed compatible with this aim; however, it does not represent the global situation as only a limited number of countries are included. In this sense, the analysis should be extended to all countries in the world to see the global situation in a more objective manner. Studies on similar subject give important messages. For example, the study of Yuri Lee et al. -which aims to investigate the impact of tobacco industry interference on the implementation and management of tobacco control and the tobacco epidemic using the TIII and MPOWER and adult daily smoking prevalence in 30 countries- emphasizes that national governments and global society should counter tobacco industry interference to protect public health and advance tobacco control policies.[7] Additionally, transdisciplinary features[8] of health (and disease) should be given priority in this long and challenging journey.

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