Early Online

The European Research Journal 2025 Original Article

DOI: https://doi.org/10.18621/eurj.1654844 *Public Health*

The impact of psychological status and quality of life of employees on presenteeism in the health-work relationship after earthquakes in Türkiye

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ABSTRACT

Objectives: This study aims to investigate the workers' general health, psychological status, and quality of life perception on presenteeism after the major earthquakes on Türkiye in the relationship between health and labor.

Methods: This study was conducted at Baykan Denim Company, which manufactures in Malatya, with the participation of 327 employees. Data were collected using the socio-demographic questionnaire form, the Attitude Scale for Determining the Psychological Status of Individuals Exposed to Earthquakes, the General Health Questionnaire-12, the Quality of Life Scale and the Presenteeism Scale.

Results: The findings showed that the Attitude Scale for Determining the Psychological Status of Individuals Exposed to Earthquakes scores had a positive statistically significant effect on Presenteeism (β1=0.443; P=0.001) and General Health (β1=0.495; P=0.001) scores and a negative statistically significant effect on the Quality of Life (β1=-0.145; P=0.001) scores. Presenteeism scores had a positive and statistically significant effect on general health (β1=0.183; P=0.001) and Quality of Life (β1=0.131; P=0.009) scores. Presenteeism scores increased as general health and the Quality of Life scores increased.

Conclusions: This study concluded that individuals were mentally impacted by the earthquake. This impact was seen in individuals' overall health perception and quality of life, leading to elevated presenteeism rates.

Keywords: Earthquake, health, quality of life, presenteeism

On February 6, 2023, two major seismic tremors with sizes of 7.8 Mw and 7.5 Mw happened in progression, nine hours separated, within the Kahramanmaraş area of Türkiye. At slightest 50 thousand individuals lost their lives, and more than 100 thousand individuals were injured in Türkiye after the earthquakes. After the seismic tremor, more than 40 thousand post-quake tremors with sizes of up to 6.7 Mw happened. This earthquake was recorded as the longest, biggest, and most serious seismic tremor in the history of the Republic of Türkiye [1].

Natural events, such as earthquakes, hurricanes, and volcanic eruptions, are uncontrollable natural processes. These natural events may cause significant human and economic losses in settlements, infrastructure elements, and agricultural areas in societies that cannot be adequately prepared for disasters for various reasons [2]. In addition to these losses, earthquakes

Received: March 10, 2025 **Accepted:** June 15, 2025 **Available Online:** June 19, 2025 **Published:** XX XX, 2025

How to cite this article: Koca M, İnceoğlu F, Deniz S. The impact of psychological status and quality of life of employees on presenteeism in the health-work relationship after earthquakes in Türkiye. Eur Res J. 2025. doi: 10.18621/eurj.1654844

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can also profoundly affect social life and are disasters that have the potential to cause severe psychological effects on people [3]. Studies show that people are affected in various ways after an earthquake. It was determined that people were psychologically affected by the 8.0 magnitude earthquake in Wenchuan in 2008. There was a significant correlation between variables such as job satisfaction, life satisfaction and personal health perception [4]. A study by Oishi *et al*. found that those whose homes were damaged in the Hanshin-Awaji Earthquake reported lower life satisfaction, more negative emotions, and more health problems than those whose homes were not damaged, even 16 years after the earthquake [5]. Türkan and Hatipoğlu concluded that individuals who experienced the 2023 Türkiye earthquake and participated in voluntary aid activities had higher depression and anxiety scores than those who were not exposed to the earthquake [6].

Individuals physically and psychologically affected by disasters, such as earthquakes, may experience a loss of productivity in their working lives. This loss of productivity can occur in two ways. The first is the employee's physical inability to be at work (absenteeism). The second is the inability to fully devote oneself to work despite being at work. The inability of an individual to fully devote oneself to work despite being at work, that is, being present at work, is expressed in English as the word presenteeism. The word "Presenteeism" is derived from the word "presence." "Presence" as a word means being present, being ready, being there, and appearing there. Based on the meaning of the word, "Presenteeism" is used for the loss of productivity due to the inability of the person to fully devote himself/herself to the work for various reasons although he/she is apparently present [7].
There are various definitions of presenteeism. According to Schultz and Edington, presenteeism is defined as "the reduction in the ability of employees to work due to a physical or health-related illness and is measured by costs related to loss of productivity, work errors, and falling below production standards" [8]. According to Martinez and Ferreira, presenteeism is "the fact that employees are at work despite not being able to work at full efficiency due to illness or health conditions" [9]. In these definitions, the concept of "health" comes to the fore. The World Health Organization (WHO) defined health as "not merely the absence of disease but a state of complete physical, mental and social well-being." After this definition, the concept of quality of life in measuring "well-being" has gained increasing importance in health services research and practice [10].

Although the concept of quality of life is often associated with health, it is actually a multi-dimensional concept. This concept is affected by many elements, such as health, education, the economy, and the environment. In this context, quality of life is defined as a state of well-being that includes material and spiritual conditions directly affecting an individual's life [11]. Health-workforce interaction is among the crucial factors in the development of societies.

Health is one of the fundamental elements of economic development and has an important place in reducing poverty and inequalities. Spending on health services to improve the health of individuals and society develops human capital and contributes to economic growth. With economic growth, human capital investments increase, which leads to chain growth [12]. Individuals and societies need to be healthy. Destructive earthquakes have a significant place in human life, and determining the stress experienced after an earthquake, the perception of quality of life, and its impact on working life are critical in developing socio-economic policies for the effective management of the post-disaster period. To our knowledge, no study was found examining the effects of destructive earthquakes on the general and mental health of individuals, the quality of life, and the presenteeism of workers in their working lives, and conducting a study on this subject is important in terms of filling an important gap in the literature.

This study aims to investigate the workers' general health, psychological status, and quality of life perception on presenteeism after the major earthquakes on Türkiye in the relationship between health and labor.

METHODS

Type and Hypotheses of this Research

This study used a relational screening model. The main hypothesis of this study is stated below:

➤H1: The Psychological Status scores of those exposed to the earthquake influence General Health, WHOQOL, and presenteeism scores.

➤H2: The General Health Questionnaire scores

mediate the association between the psychological state of individuals exposed to the earthquake and presenteeism.

➤H3: WHOQOL ratings mediate the link between the psychological state of individuals exposed to an earthquake and presenteeism.

Place and Time of this Research

The data were gathered online and in person from Baykan Denim Company employees in Malatya between February 19, 2024, and May 10, 2024. The company is among the foremost enterprises in Malatya's textile industry, employing roughly 1,000 individuals.

Sample Selection and Number of Samples

Although there is no clear expression for the Structural Equation Model (SEM), it is reported that studies are using 250-500 sample sizes [13]. Kline [14] suggests that the sample size should be 200 or more in analyses conducted with SEM. In line with these views, n=327 participants were included in the present study. Participants were chosen by voluntary sampling and snowball sampling techniques, both of which are non-probability sampling approaches.

Data Collection Tools

Personal Information Form

A 10-question questionnaire was applied to determine the socio-demographic characteristics of the participants in this study.

General Health Questionnaire

This is a scale developed by Goldberg [15] in the 1970s. After the 60-question form, short forms with 30, 28, and 12 questions were also developed and found to be equally reliable. The General Health Questionnaire-12 (GHQ-12) comprises 12 items. The Cronbach's alpha coefficient for internal consistency of the scale was 0.78 [15]. It has been adapted to Turkish by Kılıç [16]. The scale is designed as a 4-point Likert type and is scored as 0-1-2-3 or, as advised in the GSA handbook, as 0-0-1-1. Elevated scores on this scale indicate a heightened prevalence of psychological issues, specifically anxiety and sadness [16].

Attitude Scale to Determine the Psychological States of Individuals Exposed to an Earthquake (ASDPSIEE)

It was created by Filiz *et al*. [17] to assess the psychological conditions of individuals affected by an earthquake. The scale was developed using a 5-point Likert format and comprises six dimensions and 41 statements categorized as "Detachment from Life, Social Health, Spiritual Change, Trauma Anxiety, Maturation, and Avoidance." The scale lacks a reverse expression. A high score signifies that the pertinent dimension is regarded at an elevated degree. The Cronbach's alpha coefficient for the scale created by Filiz *et al*. [17] was 0.96.

Quality of Life Scale (EUROHIS WHOQOL-8.Tr)

The “Quality of Life Scale” is a general-purpose Health Quality of Life (HQOL) scale created by selecting specific questions from the EUROHIS-QOL.8 (WHOQOL- 8) WHOQOL-Bref scale produced from the World Health Organization Quality of Life Scale (WHOQOL) [18]. The scale consists of 8 questions. It was prepared in a 5-point Likert type. As the scores obtained from the scale increase, the quality of life also improves [19, 20]. The Turkish validity and reliability assessment of the scale was performed by Eser *et al*. [21]. Two questions of the WHOQOL scale are aimed at determining general health and general quality of life, and the remaining six questions are aimed at determining physical, mental, social, and environmental dimensions [21].

Presenteeism Scale

The "Stanford Presenteeism Scale (SP 6)," created by Koopman *et al*. [22] and comprising six items, was utilized. The scale consists of two sub-dimensions: distraction avoidance (items 1, 3, and 4) and task completion (items 2, 5, and 6). The reliability investigation yielded a Cronbach’s alpha value of 0.80 [22]. A study on the validity and reliability of the Turkish adaptation of the scale has been undertaken by several authors [23-25]. The Stanford Presenteeism Scale is a 5-point Likert-type scale. While items 1, 3, and 4 in the scale are scored directly, questions 2, 5, and 6 are scored reversely. The total score varies from 6 to 30. High scores indicate a high level of presenteeism.

Ethical Aspects of this Research

Ethics committee approval was received for the study from Malatya Turgut Özal University Non-interventional Clinical Research Ethics Committee with

the decision dated 15.02.2024 and numbered E-30785963-020-208770. This study was done in conformity with the Declaration of Helsinki, and consent was acquired from the participants.

Statistical Analysis

Data analysis in the study was performed using SPSS (Statistical Program in Social Sciences) 28 and AMOS 24 statistical software programs. Kolmogorov-Smirnov technique was used to control normal distribution. The significance level (p) was taken as 0.05 for comparison tests. Mann-Whitney U test with Bonferroni correction was used for independent two-group variables, and the Kruskal-Wallis test was used for in-

Table 1. Demographic information

Variable		Data
Age (years)		34.86±8.24 (18-60)
Gender, n (%)	Female	116 (35.5)
	Male	211 (64.5)
Age group, n (%)	18-30 years old	114 (34.9)
	31-40 years old	122 (37.3)
	Ages 41 and above	91 (27.8)
Educational status, n (%)	Primary education	123 (37.6)
	High school	152 (46.5)
	University and above	52 (15.9)
Marital status, n (%)	Married	187 (57.2)
	Single	140 (42.8)
Having children, n (%)	Yes	182 (55.7)
	No	145 (44.3)
Disabled person responsible for caring for family, n (%)	Yes	64 (19.6)
	No	263 (80.4)
Working hours in the factory, n (%)	Less than 1 year	36 (11.0)
	1-3 years	106 (32.4)
	4-10 years	163 (49.8)
	11-20 years	22 (6.7)
Residence during an earthquake, n (%)	Homeowner	178 (54.4)
	Tenant	149 (45.6)
Condition of the residence during the earthquake, n (%)	Undamaged	56 (17.1)
	Slightly damaged	163 (49.8)
	Medium damaged	22 (6.7)
	Severely damaged	54 (16.5)
	Ruined	32 (9.8)
Current place of stay, n (%)	In my current home	209 (63.9)
	In the container	77 (23.5)
	With my relatives	21 (6.4)
	Other	20 (6.1)

Data are shown as mean±standard deviation (minimum-maximum) or n (%)

dependent multi-group variables. Numbers and percentages were preferred as descriptive values for categorical data, and mean and standard deviation were preferred for quantitative data.

For the multiple normal distribution control, the "Observations farthest from the centroid (Mahalonobis Distance) Menu" in the AMOS program was checked, and the skewness value was calculated as 2.998. Since this value is less than 8, it was assumed to provide a multivariate normal distribution [26]. Since the normal distribution was provided, the Pearson correlation coefficient was used to compare quantitative variables. Structural Equation Modelling (SEM), a mediation analysis method based on the bootstrap method, was preferred to examine the mediation effect between the scales.

The SEM method has been reported to be more reliable than the classical method and the results were obtained with the Sobel test. We reloaded five thousand samples to apply the bootstrap method. The lower and upper limits of the 95% confidence interval (CI) found by the bootstrap method were interpreted by seeing if they included zero (0) values. The model fit indices were used to see if the models were significant [27].

RESULTS

Demographic information about the participants included in this study is given in Table 1, and descriptive statistics of scale scores are in Table 2 below.

Of the participants, 64.5% (n=211) were male, 37.3% (n=122) were between the ages of 31-40, 46.5% (n=152) were high school graduates, 57.2% (n=187) were married, 55.7% (n=182) had children, and 80.4% (n=263) had no dependent disabled person in the family, 49.8% (n=163) had been working in the factory for 4-10 years, 54.4% (n=178) stated that the house they were residing in at the time of the earthquake belonged to them and 63.9% (n=209) stated that they were currently residing in their own house. The average age of the study participants was calculated as 34.86.

Cronbach's α values of the scales used were higher than 0.70, indicating high reliability [28]. In our study, Cronbach's α values of the scales were between 0.78 and 0.86 (Table 2). A comparison of scale scores according to demographic variables is presented in Table 3.

A statistical difference was found in the Presenteeism Scale scores for gender (P<0.05), but no difference was found in the Psychological Status of Individuals Exposed to the Earthquake, General Health, and WHOQOL Scales (P>0.05). No difference was found in Psychological Status, General Health, WHOQOL and Presenteeism Scales of Individuals Exposed to Earthquake according to age, educational status and marital status (P>0.05).

A statistical difference was found between those with and without children, those with and without disabled dependents in the family, and those who owned or did not own the house where they lived during the earthquake in the scale scores of Psychological Status of Individuals Exposed to Earthquake (P<0.05), but no difference was found in Presenteeism, General Health and WHOQOL Scales (P>0.05).

A statistical difference was found in the Psychological Status of Individuals Exposed to an Earthquake scale scores according to the conditions of the residence (P<0.05), but no difference was found in the Presenteeism, General Health, WHOQOL Scales (P>0.05). According to the conditions of the residence, there was a difference between houses with severe damage and undamaged houses (P=0.001). There was a difference between houses with moderate damage and undamaged houses (P=0.002). There was a difference between houses with moderate damage and

Table 2. Descriptive statistics of scale scores

Scale	Mean±SD	(Min-Max)	Cronbach's
ASDPSIEE	130.39±43.27	41-205	0.78
General health	14.5±8.13	0-36	0.86
WHOQOL	24.07±7.5	8-40	0.82
Presenteeism	16.9±6.19	6-30	0.82

SD=standart deviation, Min-Max=minimum-maximum

Table 3. Comparison of scale scores according to demographic variables

Variables	Groups	ASDPSIEE		General health		WHOQOL 8		Presenteeism	
		Mean±SD	Mean (Min-Max)	Mean±SD	Mean (Min-Max)	Mean±SD	Mean (Min-Max)	Mean±SD	Median (Min-Max)
Gender	**Female**	133.17±40.26	133.5 (41-205)	14.07±8.87	12 (0-36)	24.89±6.59	25 (8-40)	17.92±5.97	18 (6-30)
	Male	129.29±44.56	128 (41-205)	14.76±7.72	12.5 (0-35)	23.62±7.94	24(8-40)	16.38±6.24	18 (6-30)
Mann Whitney		11543.500		11259.000		11094.500		**10095.000**	
P value		0.396		0.231		0.182		**0.009***	
Age (years)	**18-30 years old**	129.46±45.81	127.5 (41-205)	13.81±7.99	12 (0-36)	24.67±7.74	25 (8-40)	17.08±6.56	18 (6-30)
	31-40 years old	127.67±40.86	129 (41-205)	14.83±8.39	12 (0-36)	23.15±8.39	24 (8-40)	17.21±5.84	18 (6-30)
	41 years and older	136.18±42.28	147 (41-205)	14.98±8.02	14 (0-34)	24.55±5.69	24 (12-40)	16.36±6.17	17 (6-30)
Kruskal Wallis		2.250		1.805		2.731		1.166	
P Value		0.325		0.406		0.255		0.558	
Educational status	**Primary education**	133.4±41.92	138 (41-205)	14.42±7.94	12 (0-35)	23.5±7.55	24 (8-40)	17.14±6.72	18 (6-30)
	High school	132.22±41.49	130 (41-205)	14.26±7.83	13 (0-35)	24.94±7.15	25 (8-40)	16.74±5.96	18 (6-30)
	University graduate and above	119.71±48.98	123.5 (43-205)	15.46±9.49	12.5 (2-36)	22.88±8.22	24 (8-39)	16.96±5.58	17 (6-30)
Kruskal Wallis		3.202		0.105		3.983		0.360	
P value		0.202		0.949		0.136		0.835	
Marital status	**Married**	131.95±42.68	131 (41-205)	14.59±8.03	13 (0-35)	24.27±7.41	25 (8-40)	17.06±6.18	18 (6-30)
	Single	128.95±43.64	129 (41-205)	14.4±8.31	12 (0-36)	23.81±7.65	24 (8-40)	16.75±6.2	18 (6-30)
Mann Whitney		12215.000		12573.500		12617.500		12510.000	
Sig. (p)		0.301		0.541		0.652		0.492	
Having children	**Yes**	134.16±41.85	140 (41-205)	14.77±8.14	13 (0-35)	24.34±7.45	24 (8-40)	17.09±6.38	18 (6-30)
	No	126.26±44.28	123.5 (41-205)	14.18±8.15	12 (0-36)	23.73±7.58	25 (8-40)	16.72±5.94	18 (6-30)
Mann Whitney		11475.500		12469.000		12988.500		12516.500	
P value		**0.043***		0.392		0.891		0.423	
Disabled person responsible for caring for family	**Yes**	142.73±41.23	152 (52-205)	16.22±9.63	15 (0-36)	24.52±8.47	26 (8-40)	17.83±5.75	18 (6-30)
	No	127.78±43.06	126 (41-205)	14.1±7.71	12 (0-36)	23.96±7.27	24 (8-40)	16.71±6.27	18 (6-30)
Mann Whitney		6853.000		7381.000		7793.500		7610.000	
Sig. (p)		**0.021***		0.127		0.464		0.233	

Table 3 contunied. **Comparison of scale scores according to demographic variables**

Variables	Groups	ASDPSIEE		General health		WHOQOL 8		Presenteeism	
		Mean±SD	Mean (Min-Max)	Mean±SD	Mean (Min-Max)	Mean±SD	Mean (Min-Max)	Mean±SD	Median (Min-Max)
Working hours in the factory	**Less than 1 year**	130.11±43.16	127.5 (53-195)	13.75±7.1	11 (4-29)	24.5±7.19	24 (11-36)	17.25±4.99	18 (6-30)
	1-3 years	130.42±46.95	129 (41-205)	15.21±7.83	14 (0-36)	24.18±7.77	25 (8-40)	16.86±6.41	18 (6-30)
	4-10 years	127.54±40.84	129 (41-205)	13.51±8.16	12 (0-36)	24.3±7.55	25 (8-40)	16.73±6.33	17 (6-30)
	11-20 years	155.86±32.16	159 (87-189)	19.82±9.14	19 (2-34)	21.18±6.08	21 (9-31)	18.18±5.9	18 (6-29)
Kruskal Wallis		9.473		14.740		3.906		1.530	
P value		**0.024***		**0.002***		0.272		0.675	
Residence during an earthquake	**Homeowner**	126.58±41.68	126 (41-205)	14.81±8.44	12(0-36)	23.86±7.34	24 (8-40)	16.9±6.03	18 (6-30)
	Tenant	135.52±44.28	134 (41-205)	14.15±7.78	12(0-35)	24.32±7.72	25 (8-40)	16.96±6.38	18 (6-30)
Mann Whitney		11557.500		12779.000		12460.500		13250.000	
P value		**0.045***		0.571		0.391		0.990	
Condition of the residence during the earthquake	**Undamaged**	122.73±43.34	119 (41-193)	12.04±7.27	12(0-30)	25.89±8.13	25 (8-40)	16.63±6.61	18 (6-30)
	Slightly damaged	125.45±41.97	126 (41-205)	15.23±8.17	12(0-35)	24.09±7.46	24 (8-40)	17.09±6.2	18 (6-30)
	Medium damaged	142.27±60.23	131 (47-205)	13.09±7.06	13(2-25)	24.23±7.54	25 (12-40)	17.68±7.85	17 (6-30)
	Severely damaged	142.19±38.9	146 (52-205)	15.11±9.26	14(0-36)	22.35±7.72	23 (8-40)	16.74±5.68	18 (6-30)
	Ruined	143.56±33.93	152 (85-198)	15.16±7.58	14.5(5-29)	23.59±5.68	24 (11-34)	16.44±5.1	18 (6-24)
Kruskal Wallis		11.119		5.416		6.075		0.177	
P value		**0.025***		0.247		0.194		0.996	
Current place of stay	**In my current home**	125.79±42.41	125 (41-205)	14.04±7.67	12(0-35)	24.24±7.45	24 (8-40)	16.8±6.29	18 (6-30)
	In the container	143.94±41.87	149 (48-205)	14.84±7.79	13(3-36)	23.71±7.21	24 (8-40)	17.62±5.93	18 (6-30)
	With my relatives	141.9±42.88	134 (82-198)	20.24±9.91	19(6-36)	20.14±6.46	21 (8-30)	16.52±4.73	17 (6-30)
	Other	118.55±43.58	123.5 (41-185)	12.1±10.09	12.5 (0-35)	27.8±8.56	28 (11-40)	16±7.5	16 (6-30)
Kruskal Wallis		11.060		8.903		10.418		1.938	
P value		**0.011***		**0.031***		**0.015***		0.585	

Data are shown as mean±standard deviationor median (minimum-maximum).

*P<0.05; There is a statistical difference between the groups.

houses with severe damage (P=0.004).

A statistical difference was found in the Psychological Status and General Health Scale scores of individuals exposed to the earthquake according to their working hours in the factory (P<0.05), but no difference was found in the Presenteeism and WHOQOL Scales (P>0.05).

According to the working hours in the factory, in the Psychological Status of Individuals Exposed to the Earthquake Scale scores, there was a difference between the 1-3 year and 11-20 year groups (P=0.008). There was a difference between the 4-10 year and 11-20 year groups (P=0.002). In the General Health Questionnaire Scale scores, there was a difference between the 4-10 year and 11-20 year groups (P=0.001).

A statistical difference was found in the Psychological Status of Individuals Exposed to Earthquake, General Health, and WHOQOL Scale scores among individuals according to their current place of residence (P<0.05), but no difference was found in the Presenteeism Scales (P>0.05).

In the scale scores of the Psychological Status of Individuals Exposed to the Earthquake, there was a difference between those who stayed in their current homes and those who stayed in containers (P=0.004). In the General Health questionnaire scale scores, there was a difference between those who stayed in their current homes and those who stayed in containers (P=0.006).

In the WHOQOL Scale scores, there was a difference between those who stayed with their relatives and those who stayed in other places (P=0.004).

Results of SEM Analysis

SEM was established with observed variables to examine the relationship between the Psychological Status, General Health, WHOQOL and Presenteeism Scales of Individuals Exposed to Earthquake. The established model is given in Fig. 1. The coefficients of the model are given in Table 4.

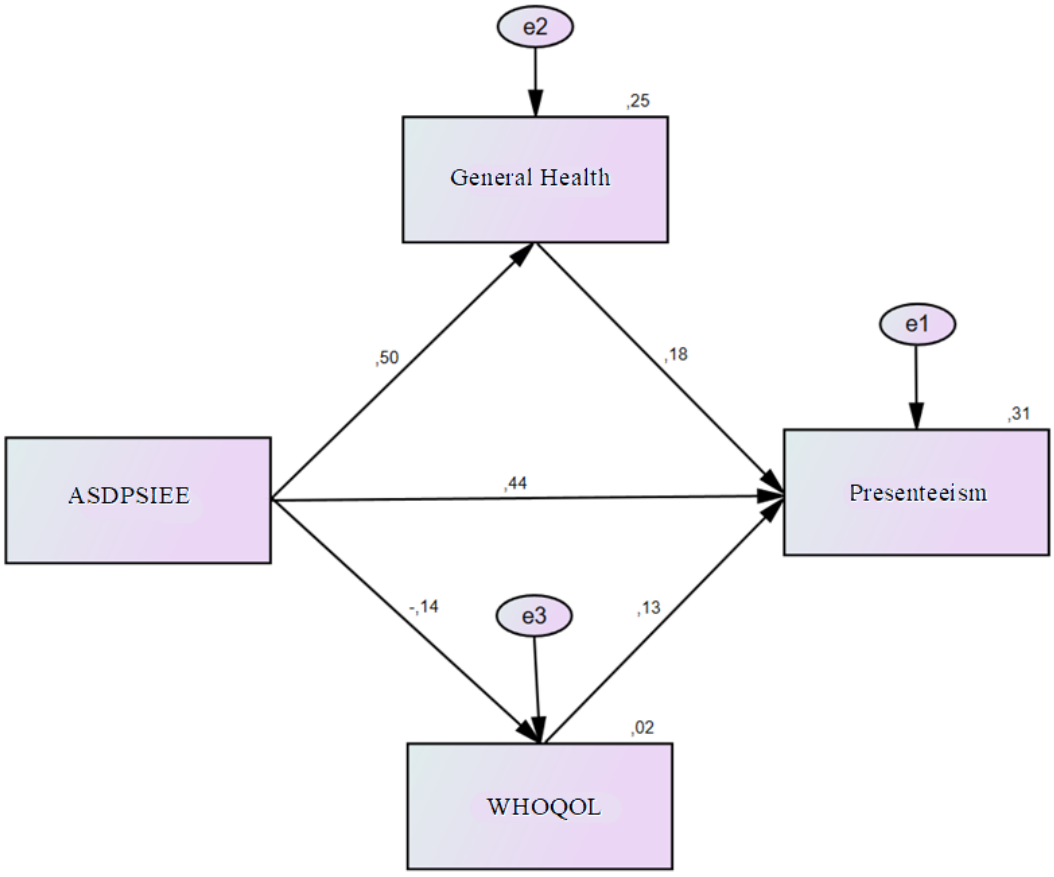

Fig. 1. Model Diagram of the Relationship between the Psychological Status, General Health, WHOQOL and Presenteeism Scales of Individuals Exposed to the Earthquake.

In structural equation modeling analyses where more than one regression model is analyzed simultaneously, a variable can be both a dependent and independent variable simultaneously. Structural equation modeling analyses provide researchers with more interpretation opportunities [29].

ASDPSIEE scores had a positive statistically significant effect on Presenteeism (β1= 0.443; P=0.001) and General Health (β1=0.495; P=0.001) scores and a negative statistically significant effect on WHOQOL (β1=-0.145; P=0.001) scores. As ASDPSIEE scores increase, Presenteeism and General Health scores will increase, and WHOQOL scores will decrease. Presenteeism scores had a positive statistically significant effect on General Health (β1=0.183; P=0.001) and WHOQOL (β1= 0.131; P=0.009) scores. As General Health and WHOQOL scores increase, Presenteeism scores will increase.

ASDPSIEE scores explained 3% of WHOQOL scores (R2=0.03) and 25% of General Health scores (R2=0.25). The effect of ASDPSIEE scores on General Health was higher than its effect on WHOQOL. ASDPSIEE, WHOQOL and General Health Scores together explained 31% (R2=0.31) of Presenteeism scores. 65.3% of hyperarousal scores and 58.8% of avoidance scores were explained by reliving scores. 55.1% of negative change scores were explained by avoidance and reliving scores.

In structural equation modeling, which use many fit indices rather than a singular fit index, the accuracy of the established model is evaluated based on the factors identified in the research. Within the newly made model, according to the analysis results, the goodness of fit index value χ2/df (Chi-Square Goodness of Fit; χ2, df; degree of freedom) was found to be 4.372. The RMSEA (Root Mean Square Error of Approximation) value of 0.075 (RMSEA<0.80), which is the index showing the adequacy of the sample size, shows that the sample size is sufficient for the model used. The GFI (Goodness of Fit Index) value was 0.939, CFI (Comparative Fit Index) was 0.926, IFI (Incremental Fit Index) was 0.927, and NFI (Normed Fit Index) was 0.924. In terms of fit indices, the model fit was seen to be very good [29, 30].

In the mediation model established for general health and WHOQOL, the new approach Bootstrap results found that the indirect effects of ASDPSIEE scores on presenteeism were statistically significant (β= 0.072, CI [0.019-0.129]). It was observed that the Bootstrap lower confidence interval (0.019) and upper confidence interval (0.129) obtained using the percentage method did not include the value zero (0). The mediator model was statistically significant [31, 32]. The indirect effect of general health and WHOQOL in explaining the indirect effect of ASDPSIEE scores on Presenteeism was 0.72.

DISCUSSION

According to the International Disaster Database (EM-DAT) developed by the Disasters Epidemiology Research Center, in 2021, 432 catastrophic events worldwide caused 10,492 deaths and economic losses of approximately 252.1 billion USD [33]. In Türkiye, the approximate cost of the Kahramanmaraş earthquakes in 2023 is estimated to be 103.6 billion dollars [34].

The deterioration of the health of individuals negatively affects all areas together with economic systems. Because the capacity of the labor force is one of the essential elements of production, doing business decreases when health deteriorates [35]. While it is

Table 4. Descriptive values of model coefficients

Dependent Variable	Independent variable	β_1	β_2	P value	R^2
Presenteeism	**ASDPSIEE**	0.443	0.064	**0.001***	0.31
	WHOQOL_8	0.131	0.108	**0.009***	
	General health	0.183	0.14	**0.001***	
WHOQOL_8	**ASDPSIEE**	-0.145	-0.025	**0.008***	0.03
General health	**ASDPSIEE**	0.495	0.093	**0.001***	0.25

β_1=Standardized regression coefficients, β_2=Unstandardized regression coefficients, R^2=Explanatory coefficients

*P<0.05; t test result for the significance of the regression coefficients

easier to measure the loss of productivity when individuals are not directly at work (absenteeism), it is more challenging to measure the loss of productivity due to presenteeism. However, according to calculations, it is stated that the loss due to presenteeism is greater than the loss due to absenteeism [7, 36, 37]. Stewart *et al*. [38] reported that the loss of productive time due to widespread pain in a study conducted among active workers in the United States reached approximately $61.2 billion per year and found that the vast majority of the lost productive time (76.6%) was due to poor performance while at work, not absenteeism [38]. Hemp [39] reported that 63% of the financial loss was due to presenteeism, which cost $311.8 million.

In this study, a statistically significant difference was found in the presenteeism scale scores for gender. There are different results in the studies conducted in the literature [40-43]. Bulan and Söyük [44] examined 46 theses on presenteeism in our country between 2007 and 2022 and determined that women generally have higher levels of presenteeism than men. They stated that women are at higher risk of stress and depression than men and that this increases presenteeism behavior in the workplace [22, 45]. No relationship was found between presenteeism and age, marital status, education level, and length of service at the workplace. This result is consistent with the results of the study conducted by Yılmaz [40] in 2019 with employees of a textile company in Edirne [40].

ASDPSIEE scores have a positive statistically significant effect on Presenteeism (β1= 0.443; P=0.001) and General Health (β1=0.495; P=0.001) scores and a negative statistically significant effect on WHOQOL (β1=-0.145; P=0.001) scores. As ASDPSIEE scores increase, Presenteeism and General Health scores will increase, and WHOQOL scores will decrease. The first hypothesis of this study, "H1: The Psychological Status scores of those exposed to the earthquake influence General Health, WHOQOL, and Presenteeism scores." hypothesis was accepted.

Presenteeism scores have a positive statistically significant effect on General Health (β1=0.183; P=0.001) and WHOQOL (β1= 0.131; P=0.009) scores. ASDPSIEE scores explain 3% of WHOQOL scores (R2=0.03) and 25% of General Health scores (R2=0.25). This result has determined that individuals' psychology is affected after major traumas, affecting their perception of health and life and increasing presenteeism in working life. Howard *et al*. [46] found in their study that occupational and health factors mediate stress, and stress contributes significantly to presenteeism at work.

In a study conducted by Li *et al*. [47] on Chinese nurses, it was determined that health was significantly associated with absenteeism and loss of productivity in nurses and had a mediating effect. It was determined that health played a fully mediating role between nurses' presence at work and loss of productivity, and the indirect effect explained 36% of the total effect [47]. This study determined that ASDPSIEE, WHOQOL and General Health scores together explained 31% (R2=0.31) of Presenteeism scores.

The mediator model established in this study was statistically significant. In explaining the indirect effect of ASDPSIEE scores on Presenteeism, the indirect effect of General Health and WHOQOL was calculated as 0.72. In the light of these data, the research hypotheses “H2: The General Health Questionnaire scores mediate the association between the psychological state of individuals exposed to the earthquake and presenteeism.” and “H3: WHOQOL ratings mediate the link between the psychological state of individuals exposed to an earthquake and presenteeism.” were accepted. It is stated that those who evaluate their own health as poor may be more likely to experience presenteeism [48]. Magalhaes *et al*. [49] found in their study that quality of life is significantly correlated with presenteeism. Aronsson *et al*. [50] also determined in their study that health and motivation are correlated with presenteeism and absenteeism. Studies show that people are directly affected by events that directly affect their lives, and this influence is reflected in their daily lives.

Limitations

he study results are limited to the factory where the study was conducted. There may be limitations arising from the sampling method of the study.

CONCLUSION

This study concluded that individuals were mentally impacted by the earthquake. This effect was evident in individuals' overall health perception and quality of life,

leading to elevated presenteeism rates. It was established that general health perception scores and quality of life scores mediated the relationship between the psychological attitudes of those affected by the earthquake and presenteeism. The combined ASDPSIEE, WHOQOL, and General Health scores accounted for 31% of the variance in Presenteeism scores.

Protecting the health and work-life balance of the workforce is essential for the advancement of nations and enterprises, and it is vital for persons impacted by severe disasters, such as earthquakes, to expedite their recovery from their circumstances. The outcomes of this study suggest that implementing economic and psychological policies at both micro and macro levels would be advantageous for individuals.

Ethical Statement

This study was approved by the Malatya Turgut Özal University Non-interventional Clinical Research Ethics Committee (Decision no.: E-30785963-020-208770, date: 15.02.2024). This study was done in conformity with the Declaration of Helsinki, and consent was acquired from the participants.

Authors' Contribution

Study Conception: MK, Fİ, SD; Study Design: MK, Fİ, SD; Supervision: MK, Fİ, SD; Funding: MK, Fİ, SD; Materials: N/A; Data Collection and/or Processing: MK, Fİ, SD; Statistical Analysis and/or Data Interpretation: MK, Fİ, SD; Literature Review: MK, Fİ, SD; Manuscript Preparation: MK, Fİ, SD and Critical Review: MK, Fİ, SD.

Conflict of interest

The authors disclosed no conflict of interest during the preparation or publication of this manuscript.

Financing

The authors disclosed that they did not receive any grant during the conduction or writing of this study.

Acknowledgements

We would like to thank Malatya Baykan Denim Human Resources Manager Mr. Mustafa Bakan, Baykan Denim senior management and employees for their interest and contribution during the planning and implementation of the study.

Generative Artificial Intelligence Statement

The author(s) declare that no artificial intelligence-based tools or applications were used during the preparation process of this manuscript. The all content of the study was produced by the author(s) in accordance with scientific research methods and academic ethical principles.

Editor's note

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