

A Comparative Study of Environmental Attitudes, Climate Change Awareness, and Levels of Social Responsibility Among Physiotherapists and Other Healthcare Professionals

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ÖZET

Sağlık profesyonellerinin iklim değişikliği konusundaki rolleri üzerine çalışmalar yapılmış olsa da fizyoterapistlerin çevresel tutumları ve sorumluluklarıyla ilgili araştırmalar sınırlıdır. Fizyoterapistlerin bu konudaki bakış açılarını anlamak, hedefe yönelik müdahalelerin geliştirilmesine katkı sağlayabilir. Bu çalışma, fizyoterapistlerin iklim değişikliği farkındalığı, sosyal sorumlulukları ve çevresel tutumları arasındaki ilişkiyi incelemekte ve diğer sağlık profesyonelleriyle karşılaştırmaktadır. Çalışmaya fizyoterapistler, hemşireler ve hekimler dâhil edilmiş, veri toplama süreci çevrim içi ve yüz yüze anketler yoluyla gerçekleştirilmiştir. Çevresel tutumlar Yeni Ekolojik Paradigma Ölçeği, iklim değişikliği farkındalığı İklim Değişikliği Farkındalık Ölçeği ve sosyal sorumluluk ise Kişisel ve Sosyal Sorumluluk Ölçeği ile değerlendirilmiştir. Çalışmaya 49 fizyoterapist, 58 hemşire ve 38 hekim katılmıştır. Gruplar arasında Yeni Ekolojik Paradigma Ölçeği – Çevreci Alt Ölçeği puanlarında anlamlı fark bulunmuştur ($p<0.05$). Fizyoterapist grubunda, İklim Değişikliği Farkındalık Ölçeği – İklim Değişikliği ile İlgili Kaygı Düzeyi alt ölçeği ile Yeni Ekolojik Paradigma Ölçeği – Çevreci Alt Ölçeği arasında pozitif bir korelasyon saptanmıştır ($p<0.05$). Ayrıca, İklim Değişikliği Farkındalık Ölçeği – Davranış ve Politikarlardan Beklentiler alt ölçeği, hem Yeni Ekolojik Paradigma Ölçeği – Çevreci Alt Ölçeği hem de Kişisel ve Sosyal Sorumluluk Ölçeği ile pozitif korelasyon göstermiştir ($p<0.05$). Diğer parametreler arasında anlamlı bir ilişki saptanmamıştır ($p>0.05$). Hekimler, fizyoterapistler ve hemşireler benzer düzeyde iklim farkındalığı ve çevresel duyarlılık göstermektedir. Sağlık profesyonellerine yönelik farkındalık ve eğitim kampanyaları büyük önem taşımaktadır. Fizyoterapistlerin çevresel tutumlarının geliştirilmesi, iklim farkındalıklarını artırabilir. Daha geniş örnekleme yapılacak ileri çalışmalar gereklidir

Anahtar kelimeler: İklim Değişikliği, Çevre, Sağlık Profesyoneli, Fizyoterapist

ABSTRACT

Although the roles of healthcare professionals in climate change mitigation have been extensively studied, physiotherapists' environmental attitudes remain underexplored. Understanding their perspectives can help develop targeted interventions. This study examines the relationship between physiotherapists' climate change awareness, social responsibility, and environmental attitudes, comparing them with other healthcare professionals. The study included physiotherapists, nurses, and physicians through web-based and face-to-face surveys. Environmental attitudes were assessed using the New Ecological Paradigm Scale, climate change awareness with the Climate Change Awareness Scale, and social responsibility with the Personal and Social Responsibility Scale. The sample comprised 49 physiotherapists, 58 nurses, and 38 physicians. A significant difference was found in the 'New Ecological Paradigm Scale - Environmentalist Subscale' among groups ($p<0.05$). Within physiotherapists, a positive correlation was found between the 'Climate Change Awareness Scale - Anxiety Level Related to Climate Change' subscale and the 'New Ecological Paradigm Scale - Environmentalist Subscale' ($p<0.05$). Additionally, the 'Climate Change Awareness Scale - Expectations from Behaviors and Policies' subscale correlated positively with both the 'New Ecological Paradigm Scale - Environmentalist Subscale' and the 'Personal and Social Responsibility Scale' ($p<0.05$). No significant correlations were found among other parameters ($p>0.05$). Physicians, physiotherapists, and nurses exhibit similar climate awareness and environmental sensitivity. Awareness and education campaigns targeting healthcare professionals are essential. Improving physiotherapists' environmental attitudes may enhance climate awareness. Further studies with larger samples are needed.

Keywords: Climate Change, Environment, Health Professional, Physiotherapist

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This research has not been submitted to any congress.

1. INTRODUCTION

Climate change poses direct and indirect threats to global health systems, exacerbating disease burdens and resource insecurity. Additionally, it exacerbates existing threats to food and water security, infrastructure, basic services, and livelihoods (1). As a result of these changing conditions, there is an increase in the incidence and severity of infectious, non-communicable, and vector-borne diseases (2). Governments, policymakers, and healthcare workers have recognized the urgent need to adapt to changing environmental conditions worldwide in order to improve human health and development while reducing further degradation. Government reports, scientific publications, and other sources of information consistently provide increasing evidence regarding climate change, predicting more frequent and closer disasters due to climate change (3). Although it may not have catastrophic effects on global health, it is estimated to have a significant impact and affect millions of people by the year 2100. This implies a greater need for healthcare systems and health teams to support future efforts in rescue, intervention, and assistance. International initiatives such as the United Nations' 2030 Sustainable Development Goals, the World Health Organization's Global Strategy on Health, Environment, and Climate Change, and the Paris Agreement are significant endeavors in this regard (4,5).

Although studies demonstrating the relationship between physiotherapy, environment, and health are limited, physiotherapy plays a significant role in sustainable development, environmental sustainability, and environmental management (6). In light of the ecological challenges humanity faces today, there is a need for a more conscious effort to reconsider the relationship between physiotherapy and the environment in all its aspects (7). This relationship can be examined from different perspectives. Firstly, amidst the increasing technological burden in healthcare services and the harm it inflicts on the environment, the eco-friendly aspect of physiotherapy practices, which are grounded in activity and movement-based biomechanical approaches alongside a 'natural' touch, should be emphasized.

Another perspective involves enhancing people's participation in physiotherapy and rehabilitation practices, which can reduce both the burden on the healthcare system and medical technological dependence, such as diagnostic imaging, medical screening, and surgery. Furthermore, it is essential to consider how much physiotherapists take into account environmental costs in their clinical practices. Developing habits through personal awareness, such as abandoning the use of disposable papers for treatment and assessment, employing electronic devices appropriately and effectively, and continuing the use of traditional methods alongside modern approaches, can significantly reduce overall costs (8).

Climate change awareness is defined as individuals' knowledge of the causes and consequences of climate change, as well as the measures that can be taken, their ability to perceive and make sense of this issue, and their development of sensitivity toward climate-related matters (9). Environmental attitude, on the other hand, refers to the emotions, thoughts, and behavioral tendencies that individuals develop toward the environment, nature, and environmental problems (10). Although these two terms are often used interchangeably, they are actually different in meaning. There are numerous studies in the literature evaluating the knowledge and awareness levels of healthcare professionals, especially nurses, regarding climate change. In studies conducted on nurses, it has been noted that they have varying levels of knowledge on this subject, and their roles in relation to climate change as nurses are not fully understood (11,12). Similar findings are also observed in studies conducted on physicians. Although they possess some knowledge about climate change, there is a significant gap. Additionally, it has been noted that they are not entirely confident about their roles in addressing climate change (13,14).

As far as we know, there is no study specifically evaluating the knowledge and awareness levels of physiotherapists regarding climate change. While there are studies involving physiotherapy and rehabilitation department students, there are no direct studies targeting

physiotherapists themselves (15,16). Therefore, the aim of this study is to determine the relationship between physiotherapists' attitudes towards the environment, awareness levels of climate change, and level of social responsibility, and to compare them with other healthcare professionals (nurses and doctors).

2. MATERIAL AND METHOD

The research was conducted on physiotherapists, nurses, and physicians in the central district of X province, using both web-based surveys. The participants included in the study were reached through social media platforms. The questionnaire consisted of four sections and was completed in approximately 10 minutes. The study was approved by the Ethics Committee of a State University (2023/12-08). All participants were asked to indicate their voluntary participation in the study before starting the survey. The study was conducted in accordance with the principles outlined in the Helsinki Declaration.

2.1. Outcomes

2.1.1. Personal Information Form

Participants' ages, professions, professional experiences, current workplace, genders, and educational backgrounds were queried.

2.1.2. New Ecological Paradigm Scale

This questionnaire was used to evaluate individuals' attitudes toward the environment and their ecological worldview. The Turkish validity and reliability study of the New Ecological Paradigm Scale, developed by Dunlap and Liere (16), was conducted by Furman and colleagues (17). The scale is based on the premise that humans are not separate from other components of nature and are subject to the laws of nature. The questions are divided into two subgroups measuring eco-centric and anthropocentric approaches. Responses to questions 1, 3, 5, 7, 9, 11, 13, 15 provide the eco-centric view subscore, while responses to questions 2, 4, 6, 8, 10, 12, 14 provide the anthropocentric view subscore. According to the study conducted by Aytaç et al., the Cronbach's alpha coefficient of the scale was calculated as 0.53 (18).

2.1.3. Climate Change Awareness Scale

The survey was developed by Atakli and colleagues to determine the level of awareness of climate change (19). This questionnaire was used to assess individuals' knowledge levels, attitudes, awareness, and behavioral tendencies related to climate change. The scale consists of 52 items. Participants were given 5 points for "Strongly Agree," 4 points for "Agree," 3 points for "Don't Know," 2 points for "Disagree," and 1 point for "Strongly Disagree" for each item. The scores range from a minimum of 52 to a maximum of 260. The five subscales consist of awareness of climate change, perception of the problem, knowledge of the causes of climate change, anxiety level related to climate change, and expectations from behaviors and policies. The overall Cronbach's alpha coefficient of the scale was calculated as 0.92, indicating excellent internal consistency (19).

2.1.4. Personal and Social Responsibility Scale

This scale, developed by Li et al., was used to assess individuals' levels of both personal and social responsibility (20). The Turkish validity and reliability study of the questionnaire was conducted by Filiz et al. (21). It is a 6-point Likert-type scale consisting of 13 items. The scoring system of the scale is as follows: 1=Strongly Disagree, 2=Disagree a Little, 3=Disagree, 4=Agree, 5=Agree a Little, 6=Strongly Agree. The lowest possible score on the scale is 13, and the highest score is 78. The Cronbach's alpha coefficient of the scale was calculated as 0.925, indicating excellent internal consistency (21).

2.2. Statistical Analysis

The study data were entered into the SPSS 29 package program. Normality distribution of the data was examined using Shapiro-Wilk and Kolmogorov-Smirnov tests. Frequency data were presented as n and % values, while numerical data were presented as mean and standard deviation. Since the data did not follow a normal distribution, the relationship between intra-group evaluation parameters was analyzed using Spearman correlation test. The comparison of differences between groups was conducted using the Kruskal-Wallis H Test. A significance level of $p < 0.05$ was considered.

3. RESULTS

The study included 49 physiotherapists, 58 nurses, and 38 physicians. The mean age of physiotherapists was 31.02±6.27 years, nurses was 28.59±4.72 years, and physicians was 33.79±7.17 years. The professional experiences of physicians were 9.05±6.73 years, nurses were 5.83±5.17 years, and physiotherapists were 8.10±6.22 years (Table 1).

In intergroup comparisons, a statistically significant difference was found in the New Ecological Paradigm Scale – Eco-Centric Subscale ($p < 0.05$). However, no statistically significant differences were observed between the groups in the New Ecological Paradigm Scale – Anthropocentric Subscale, the Social Responsibility Scale, or the total and subscale scores of the Climate Change Awareness Scale ($p > 0.05$) (Table 2).

According to the statistical results of the intra-group relationships in the physiotherapist group, a statistically significant positive correlation was found between the 'New

Ecological Paradigm Scale - Eco-Centric Subscale' and 'Climate Change Awareness Scale' ($p < 0.05$). A statistically significant positive correlation was also found between the 'Personal and Social Responsibility Scale' and 'Climate Change Awareness Scale' ($p < 0.05$). Additionally, a statistically significant positive correlation was found between the 'Perception of Climate Change Awareness Scale' and 'Personal and Social Responsibility Scale' ($p < 0.05$). Furthermore, a statistically significant positive correlation was found between the 'Climate Change Awareness Scale - Anxiety Level Concerning Climate Change' subscale and the 'New Ecological Paradigm Scale - Eco-Centric Subscale' ($p < 0.05$). Finally, a statistically significant positive correlation was found between the 'Climate Change Awareness Scale - Expectations from Behaviors and Policies' subscale and the 'New Ecological Paradigm Scale - Eco-Centric Subscale' and 'Personal and Social Responsibility Scale' ($p < 0.05$). However, no statistically significant correlation was observed among other parameters ($p > 0.05$) (Table 3).

Table 1: Descriptive Characteristics of Participants

	Physiotherapist (N=49)	Nurse (N=58)	Physician (N=38)
Age (years) (Mean ± SD)	31.02±6.27	28.59±4.72	33.79±7.17
Professional Experience (years) (Mean ± SD)	8.10±6.22	5.83±5.17	9.05±6.73
Gender n (%)			
Female	26 (53.1%)	45 (77.6%)	20 (52.6%)
Male	23 (46.9%)	13 (22.4%)	18 (47.4%)
Graduated University n (%)			
State University	47 (95.9%)	58 (100%)	37 (97.4%)
Private University	2 (4.1%)	0 (0%)	1 (2.6%)
Educational Status n (%)			
Bachelors degree	44 (89.8%)	55 (94.8%)	11 (28.9%)
Postgraduate	5 (10.2%)	3 (5.2%)	27 (71.1%)

X: mean. SD: standard deviation. N: number of total participants. n: number of participants. %: percent

Table 2: Comparison of Groups

	Physiotherapist (N=49) (Mean ± SD)	Nurse (N=58) (Mean ± SD)	Physician (N=38) (Mean ± SD)	p
New Ecological Paradigm Scale-Environmentalism Subscale	30.90±4.64	33.09±4.48	30.92±6.26	0.025*
New Ecological Paradigm Scale-Humanism Subscale	18.78±4.70	19.34±5.11	17.92±4.85	0.496
Personal and Social Responsibility Scale	63.27±9.53	64.16±12.47	63.74±13.55	0.541
Climate Change Awareness Scale-Total Score	209.98±36.36	210.38±34.02	205.97±42.25	0.989
Climate Change Awareness Scale-Awareness of Climate Change	33.22±6.35	33.31±5.24	32.13±6.90	0.739
Climate Change Awareness Scale-Perception of the Problem	19.61±4.64	18.78±4.16	19.47±4.67	0.257
Climate Change Awareness Scale-Knowledge of the Causes of Climate Change	36.24±7.37	36.21±6.90	35.92±8.71	0.969
Climate Change Awareness Scale-Anxiety Level Related to Climate Change	46.06±8.18	46.98±8.18	44.82±10.51	0.597
Climate Change Awareness Scale-Expectations from Behaviors and Policies	74.84±14.02	75.10±14.32	73.63±15.34	0.887

X: mean, SD: standard deviation, N: number of total participants, p: Kruskal Wallis Test. *p<0.05

Table 3: Intra-group Correlations of Parameters in Physiotherapists

		New Ecological Paradigm Scale-Environmentalism Subscale	New Ecological Paradigm Scale Humanism Subscale	Personal and Social Responsibility Scale
New Ecological Paradigm Scale-Environmentalism Subscale	Correlation Coefficient	1.000	-0.132	0.275
	Sig. (2-tailed)	.	0.366	0.055
	N	49	49	49
New Ecological Paradigm Scale-Humanism Subscale	Correlation Coefficient	-0.132	1.000	-0.054
	Sig. (2-tailed)	0.366	.	0.715
	N	49	49	49
Personal and Social Responsibility Scale	Correlation Coefficient	0.275	-0.054	1.000
	Sig.(2-tailed)	0.055	0.715	.
	N	49	49	49

Climate Change Awareness Scale- Total Score	Correlation Coefficient	0.288	0.058	0.412
	Sig. (2-tailed)	0.045*	0.690	0.003**
	N	49	49	49
Climate Change Awareness Scale- Awareness of Climate Change	Correlation Coefficient	0.097	0.022	0.220
	Sig. (2-tailed)	0.506	0.880	0.129
	N	49	49	49
Climate Change Awareness Scale- Perception of the Problem	Correlation Coefficient	0.071	0.085	0.344
	Sig. (2-tailed)	0.626	0.561	0.016*
	N	49	49	49
Climate Change Awareness Scale- Knowledge of the Causes of Climate Change	Correlation Coefficient	0.161	0.005	0.296
	Sig. (2-tailed)	0.269	0.972	0.039
	N	49	49	49
Climate Change Awareness Scale- Anxiety Level Related to Climate Change	Correlation Coefficient	0.309	0.100	0.267
	Sig. (2-tailed)	0.031*	0.496	0.064
	N	49	49	49
Climate Change Awareness Scale- Expectations from Behaviors and Policies	Correlation Coefficient	0.303	0.060	0.434
	Sig. (2-tailed)	0.034*	0.684	0.002**
	N	49	49	49

N: number of total participants. * $p < 0.05$

4. DISCUSSION

In this study, the relationship between physiotherapists' attitudes towards the environment, their awareness levels of climate change, and their levels of social responsibility was examined and compared with those of other healthcare professionals, including nurses and doctors. According to the results of the study, physiotherapists showed a significant relationship between their environmentally friendly attitudes, high awareness of climate change, high anxiety levels concerning climate change, and adoption of positive behaviours and policies related to climate change. Moreover, there was a positive correlation between the high level of social responsibility among physiotherapists, high awareness of climate change, and adoption of positive behaviours and policies related to climate change. Additionally, the awareness levels of climate change, levels

of social responsibility, and attitudes towards the environment were found to be similar among healthcare professionals.

Healthcare institutions and professionals play an active role in increasing awareness in society, enhancing climate literacy, reducing emissions originating from the healthcare sector, and developing and implementing strategies to mitigate the effects of climate change, considering the impacts of climate change on human and environmental health. Consequently, the healthcare sector not only focuses on treatment but also assumes a significant role in preventive healthcare (22). A study conducted with nursing students indicated that their awareness levels regarding climate change were low. Therefore, it was suggested that they should be supported with activities such as education, conferences, exhibitions, etc., to increase awareness (23). In another study involving physicians, it was noted that their knowledge levels regarding climate change were limited,

and they expressed a need for additional education and guidance on the subject (13). The adverse effects of climate change on human and environmental health are primarily addressed by healthcare system workers. Climate change impacts the delivery of healthcare services in two significant ways: by intervening in the provision of healthcare services and affecting patient care. Additionally, it puts pressure on the healthcare system by causing or exacerbating illnesses. This situation may lead to healthcare workers working under increased burden and reduced effectiveness of healthcare services (24). Therefore, it is crucial for healthcare professionals to raise awareness about sustainability and climate change issues and to play an active role in this process (25). In our study, the awareness levels and environmental sensitivities regarding climate change were compared among physiotherapists, physicians, and nurses. There were no statistically significant differences in awareness and sensitivity across the different professions. However, the scales we used do not have a cut-off value. Therefore, it is not possible to make interpretations about the adequacy of participants' awareness and sensitivity levels. The healthcare professionals we included in our study work together in multidisciplinary teams in healthcare institutions. Naturally, conducting awareness campaigns on climate change and the environment targeting healthcare professionals should encompass all professional groups, which could be a significant step in combating the problems posed by climate change.

Environmental physiotherapy is a new field aimed at promoting mutual benefits for patient health, treating physiotherapists, and consequently the environment by considering the fundamental connections between human health, the environment, and physiotherapy practice (8). This field serves as a bridge among various clinical specialties in physiotherapy, encompassing clinical practice, research, and education (7). The primary role of environmental physiotherapy is to identify global environmental issues encountered in our daily lives and to understand their impact on health (27). In our study, it was observed that as the level of social responsibility among physiotherapists increased, awareness of climate change

also increased, leading to a positive attitude towards climate change-related policies and behaviors. Additionally, an increase in environmentally centered attitudes was associated with increased awareness of climate change, heightened anxiety levels regarding the problems caused by climate change, and a positive attitude towards measures and policies aimed at preventing climate change. To the best of our knowledge, there is no study measuring the awareness, knowledge, and attitudes of physiotherapists regarding climate change. Therefore, we believe that the results of our study will serve as an important resource for future research in the field of environmental physiotherapy. New studies in this field will contribute to a more effective use of environmentally focused physiotherapy in practice and theory.

4.1. Limitations

There are some limitations to our study. It was conducted exclusively among nurses, physiotherapists, and physicians, excluding other healthcare professional groups. Additionally, since the study was carried out in a single city, the generalizability of the findings is limited. Furthermore, the reliance on self-reported measures introduces potential biases, such as social desirability and inaccurate recall, which should be considered when interpreting the results.

5. CONCLUSION

In conclusion, it is recommended that awareness and educational initiatives on climate change and environmental sensitivity target all healthcare professionals, as physicians, physiotherapists, and nurses exhibit similar levels of knowledge and attitudes regarding these issues. Moreover, the significant correlations observed within the physiotherapist group—such as those between eco-centric attitudes and climate change anxiety or policy expectations—indicate that individuals who prioritize environmental concerns may be more likely to adopt sustainable practices and advocate for environmentally responsible policies in clinical contexts. Accordingly, fostering social responsibility and eco-centric perspectives among physiotherapists may not only increase their climate change awareness but also encourage behavioral changes in

clinical decision-making, patient education, and institutional involvement. To develop more effective strategies, further large-scale studies involving a broader range of healthcare professionals are warranted.

Author contributions: Research Design: EA (%60) - HK (%40), Data Collection: EA (%80) - HK (%20), Research - Data Analysis – Verification: EA (%10) - HK (%90), Writing the Article: EA (%30) - HK (%70), Development and Revision of the Text HK (%100).

Declaration of Conflicting Interest: The authors report no conflict of interest in this research.

Funding Statement: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Acknowledgment: This study was supported by the Scientific and Technological Research Council of Turkey (TÜBİTAK) within the scope of the 2209-A-University Students Domestic Research Projects Support Program. The researchers thank TÜBİTAK for their support.

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