

Relationship Between Health Literacy and Spinal Functions in Young Adults: A Cross-Sectional Research

Genç Yetişkinlerde Sağlık Okuryazarlığı ve Omurga Fonksiyonları Arasındaki İlişki: Kesitsel Araştırma

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ABSTRACT Objective: This study investigated the relationship between health literacy (HL) and spine functions in young adults. **Material and Methods:** 367 young adults participated in the study. Researchers collected demographic data and assessed participants' health perceptions, information-seeking behaviors, and spinal pain status. Health literacy was measured using the Turkish Health Literacy Scale (TSOY-32), with scores categorized as inadequate (0-25), problematic-limited (>25-33), adequate (>33-42), or excellent (>42-50). Spine functions were evaluated using the Spine Function Index. **Results:** Participants demonstrated limited health literacy levels with a median score of 32.66 (range: 8.33-50). Primary sources for health information were healthcare professionals (49.9%), internet (37.1%), family (10.9%), and friends (2.2%). Most participants rated their general health as "good" (52.9%) or "moderate" (38.1%), with smaller percentages reporting "very good" (6.3%) or "bad" (2.7%) health status. The median spinal pain score was 80 (range: 4-100). Statistical analysis revealed no significant relationship between different health literacy levels and spinal functionality or pain measures. **Conclusion:** The study found no association between health literacy and spine pain or functioning in young adults. Participants showed limited health literacy levels overall. Given the significant life changes occurring during young adulthood, adequate health literacy is crucial and should be evaluated alongside various health-related factors to promote better health outcomes in this population.

ÖZET Amaç: Bu çalışma genç yetişkin bireylerde sağlık okuryazarlığı (SO) ile omurga fonksiyonları arasındaki ilişkiyi araştırmıştır. **Gereç ve Yöntemler:** 367 genç yetişkin katılımcı çalışmaya dahil edildi. Demografik veriler, sağlık algıları, bilgi edinme yolları ve omurga ağrısı durumu değerlendirildi. Sağlık okuryazarlığı Türkiye Sağlık Okuryazarlığı Ölçeği (TSOY-32) ile ölçüldü ve puanlar yetersiz (0-25), sorunlu-sınırlı (>25-33), yeterli (>33-42) ve mükemmel (>42-50) olarak kategorize edildi. Omurga fonksiyonları Omurga Fonksiyonel İndeksi ile değerlendirildi. **Bulgular:** Katılımcıların SO düzeyleri ortalama değeri 32,66 (aralık: 8,33-50) olarak bulundu ve sınırlı sağlık okuryazarlığı düzeyini gösterdi. Sağlık bilgisi edinme kaynakları sırasıyla doktor/sağlık personeli (%49,9), internet (%37,1), aile (%10,9) ve arkadaşlar (%2,2) idi. Katılımcıların çoğunluğu genel sağlık durumunu "iyi" (%52,9) veya "orta" (%38,1) olarak değerlendirdi. Omurga ağrısı ortalama değeri 80 (aralık: 4-100) bulundu. Farklı SO düzeyleri ile omurga fonksiyonelliği ve ağrısı arasında istatistiksel olarak anlamlı bir ilişki saptanmadı. **Sonuç:** Genç yetişkinlerde sağlık okuryazarlığı ile omurga ağrısı ve fonksiyonelliği arasında ilişki bulunmadı. Katılımcılar genel olarak sınırlı SO düzeyine sahipti. Yaşamda önemli değişimlerin yaşandığı genç yetişkinlik döneminde yeterli sağlık okuryazarlığı düzeyi kritik öneme sahiptir ve diğer sağlık faktörleriyle birlikte değerlendirilmelidir.

Keywords: Young adult; health literacy; spine

Anahtar Kelimeler: Genç yetişkin; sağlık okuryazarlığı; omurga

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According to the World Health Organization (WHO), the concept of health literacy (HL), defined as the ability of individuals to access, understand and use information necessary to protect and improve their individual health, has been a frequently researched topic in recent years.¹ HL is considered as one of the important markers for health and low levels of HL have been shown to be associated with poor health outcomes.²

Young adulthood is a process considered important in the acquisition of long-term health-related behaviors.³ In this period, in addition to the acquisition of dietary and physical activity habits (such as participation in sportive activities), negative lifestyle changes such as smoking and alcohol consumption can also be observed.⁴ This period is a period in which individuals take more responsibility for their own health and it is a process in which many preventive and protective habits will be acquired for health conditions in later ages.⁵ Therefore, an individual's ability to access health-related information and to understand and use this information, especially in young adulthood, is important for lifelong health.

There are studies from many different countries on the HL levels of individuals. It has been reported that 50% of American adults have low HL, while 74% of individuals in Türkiye have inadequate-limited HL.^{6,7} In a study involving participants from 8 different European countries, it was shown that between 2-27% of participants had inadequate HL.⁸

Lifestyle changes, working conditions, participation in physical activity, etc. brought about by young adulthood can lead to various musculoskeletal problems and cause changes in the posture of individuals.^{9,10} The resulting postural and biomechanical changes can lead to pain and loss of function in individuals.¹⁰ Stresses on spinal health and functionality in this period cause greater functional losses in later ages and have negative effects on quality of life.¹¹ Individuals' tendency to obtain information about their musculoskeletal problems is generally disease and problem specific. It has been shown that individuals have a significant lack of knowledge about musculoskeletal disorders such as spine problems.^{11,12}

Postural changes affecting the spine are considered to be one of the most important public health

problems because they can lead to many pathological conditions in later life.⁹ For this reason, young adulthood is an important time interval in terms of increasing the promotion of health-related educational and rehabilitative programs in terms of musculoskeletal disorders.¹³ There are few studies demonstrating the link between low HL levels and musculoskeletal disorders.^{14,15} The results obtained from these studies revealed that limited HL is associated with functional disability in patients with rheumatoid arthritis. In addition, it was emphasized that practices aimed at improving HL are one of the important ways to improve functionality in rheumatoid arthritis. There is a limited number of studies on the relationship between HL and spinal pain and functionality in young adults. With this current study, we aimed to reveal the relationship between HL levels and spinal functions in young adulthood.

MATERIAL AND METHODS

PARTICIPANTS

The sample of the study consisted of young adult individuals between the ages of 18-30.¹⁶ The sample size was calculated as 365 individuals with a power of 90% and an alpha error rate of 0.05, based on the HL parameter in a similar study.¹⁷

The inclusion criteria were to be a volunteer, to be between the ages of 18-30, to be able to read and write Turkish, and to be able to understand and answer the questions, while the exclusion criteria were having a condition that prevented ambulation, using an assistive device, and having a neurological or psychiatric disease.

ETHICAL APPROVAL

Ethics committee approval was obtained from Ankara Yıldırım Beyazıt University Health Sciences Ethics Committee on January 10, 2024 with decision number 01-564. The study was conducted following the Declaration of Helsinki and informed written consent was obtained from all participants before starting the study.

DATA COLLECTION TOOLS

Data were collected face-to-face by the researcher using a questionnaire. In addition to the demographic

data of the participants, questions were asked about their general and individual health perceptions, ways of accessing health-related information, pain status in their spine, and if they had spinal pain, about this pain. Participants' HL levels were assessed using the Turkish Health Literacy Scale [Türkiye Sağlık Okuryazarlığı Ölçeği (TSOY-32)] and their spine function was assessed using the Spine Function Index.

Individuals were questioned about their access to health-related information, the address they applied to, whether they experienced pain in their spine and the severity of this pain, if any, using the Visual Analog Scale (VAS). In the VAS assessment, a 100-meter line with “no pain” (0) at one end and “very severe pain” (10) at the other end is used and the person is asked to mark the location corresponding to their pain on this line.¹⁸

The TSOY-32 is a 32-question scale developed by Okayay et al. based on the European HL Survey Study. The scale consists of 2 dimensions (treatment, service and disease prevention/health promotion) and four processes (accessing health-related information, understanding health-related information, evaluating health-related information, using/applying health-related information) and 8 components in total. The total score is calculated by (mean-1) x (50/3) index and the score that can be obtained from the scale varies between 0-50. 0-25 points indicate inadequate HL, >25-33 points indicate problematic-limited HL, >33-42 points indicate adequate HL, and >42-50 points indicate excellent HL.¹⁹

The Spine Functional Index is a 25-question questionnaire, the validity and reliability of which was conducted in Turkish by Tonga et al. which evaluates the extent to which symptoms related to the spine affect an individual's life. Participants are asked to answer the questions by considering the last few days. If the item describes the person, 1 point is given, if it does not describe the person, 0 points are given, and if it describes the person a little, half points are given. Full points and percentage points are used in calculating the questionnaire. Zero percent indicates maximum limitation and functional loss, while 100 percent indicates normal status.²⁰

STATISTICAL ANALYSIS

SPSS 26 (SPSS Inc., Chicago, IL, USA) package program was used in the statistical analysis of the obtained data. Shapiro-Wilk test and histogram graphics were used in the normality analysis of the data. While descriptive data were shown with frequency and percentage, data that were normally distributed from numerical variables were expressed with mean-standard deviation, and data that were not normally distributed were expressed with median (minimum-maximum) values. Kruskal-Wallis test was used in the analysis of the difference of groups with different HL levels and $p < 0.05$ was accepted as significant.

RESULTS

The study was completed with a total of 367 young adult individuals, 246 (67%) female and 121 (33%) male, with a mean age of 24.22 ± 3.87 . 70.6% ($n=259$) of the participants were high school graduates and

TABLE 1: Descriptive data of participants

	X \pm SD
Age (year)	24.22 \pm 3.87
BMI (kg/m ²)	23.32 \pm 3.93
	n (%)
Gender	
Female	246 (67)
Male	121 (33)
Education level	
Middle school	7 (1.9)
High school	259 (70.6)
University	95 (25.9)
Master's degree	3 (0.8)
PhD	3 (0.8)
Medical history (a diagnosed disease)	
Yes	17 (4.6)
No	350 (95.4)
Surgical history	
Yes	51 (13.9)
No	316 (86.1)
Presence of continuously used medication	
Yes	29 (7.9)
No	338 (92.1)
Smoking	
Yes	81 (22.1)
No	286 (77.9)
Alcohol use	
Yes	83 (22.6)
No	284 (77.4)

SD: Standard deviation; BMI: Body mass index

71.9% (n=264) were students. The results of the demographic and descriptive data of the participants are shown in Table 1.

The first addresses used by individuals to obtain health-related information were “doctor/health personnel” (49.9%, n=183), “internet” (37.1%, n=136), “family” (10.9%, n=40) and “friends” (2.2%, n=8), respectively (Figure 1). 52.9% (n=194) of the participants described their general health status as “good”, 38.1% (n=140) as “moderate”, 6.3% (n=23) as “very good” and 2.7% (n=10) as “bad” (Figure 2).

The median values of the scores obtained by the participants from the TSOY-32 scale and the Spine Functional Index were 32.66 (8.33-50; minimum-maximum) and 80 (4-100; minimum-maximum), respectively. Other results of the scales and evaluations for spinal pain are shown in Table 2.

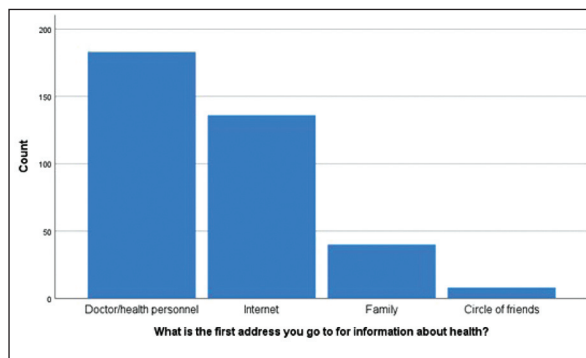


FIGURE 1: The first addresses used by participants to access health-related information

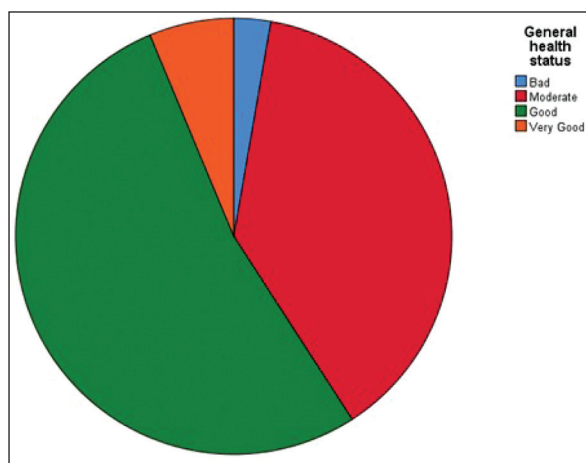


FIGURE 2: Participants' perspectives on their general health status

TABLE 2: Data on participants' health literacy and spine pain and functionality

Variables	
TSOY-32; Median (minimum-maximum)	32.66 (8.33-50)
VAS-rest; Median (minimum-maximum)	3 (0-8)
VAS-activity; Median (minimum-maximum)	3 (0-9)
VAS-Night; Median (minimum-maximum)	2 (0-9)
Spine Functional Index (%); Median (minimum-maximum)	80 (4-100)
Spine Pain	
Yes; n (%)	296 (80.7)
No; n (%)	69 (18.8)
Localization of spinal pain	
Neck; n (%)	89 (24.3)
Back; n (%)	102 (27.8)
Low back; n (%)	74 (20.2)
Entire spine; n (%)	34 (9.3)

TSOY-32: Turkish Health Literacy Scale (Türkiye Sağlık Okuryazarlığı Ölçeği);
VAS: Visual Analog Scale

There was no statistically significant difference between the groups ($p>0.05$) in the questioning of spinal functionality and pain of individuals according to different HL levels (Table 3).

DISCUSSION

The aims of this recent study were to examine HL and spinal functionality levels in young adults and to investigate the existence of a link between these two variables. The most important result obtained from this current study was that there was no relationship between HL levels and spine pain and conditionality. There was no difference between spinal pain and functionality of individuals with different HL levels. Other important results included that when the results were examined in general, the HL levels of individuals were at a limited HL level, the internet was the first address they turned to for health-related information, and the majority of young adults had complaints of spine pain.

HL levels of individuals have been associated with many health-related outcomes and conditions.² WHO has also accepted HL as a tool to help explain the mechanisms of the social determinants of health.²¹ The concepts of health behavior and HL are closely related. Health behavior includes directly observable actions of the individual on his/her own health. Al-

TABLE 3: Spinal pain and functionality according to participants' health literacy levels

	Inadequate health literacy (n=40) (X±SD)	Problematic-limited health literacy (n=153) (X±SD)	Adequate health literacy (n=107) (X±SD)	Excellent health literacy (n=67) (X±SD)	p value
VAS-rest	2.60±1.66	2.98±2.06	3.11±2.07	2.88±2.29	0.674
VAS-activity	3.42±2.03	3.62±2.64	3.44±2.49	2.82±2.20	0.234
VAS-night	2.35±1.91	3.04±2.57	2.49±2.41	2.28±2.20	0.151
Spine Functional Index (%)	78.40±13.29	76.14±16.16	78.41±21.26	78.14±16.04	0.092

SD: Standard deviation; p: Kruskal Wallis test; VAS: Visual analog scale

though these actions may vary depending on factors such as lifestyle, personal beliefs and socioeconomic level, the most well-known are nutrition, substance use and physical activity habits.²² Postural problems are also one of the habits that individuals can consciously control. It is a known fact that incorrect postures are an important risk factor for spinal pain.²³ The number of studies that reveal the relationship between health-related behaviors and HL, which are important causes of spinal pain, is quite limited. In a study conducted in Australia, individuals with chronic low back pain were compared with healthy individuals in terms of HL levels and no difference was found between the two groups.²⁴ Similarly, Loke et al. found that there was no relationship between low HL levels and poor functionality in individuals with chronic musculoskeletal conditions.²⁵ In another study examining the level of HL in individuals with chronic pain, it was stated that, contrary to other studies and the recent study, low HL levels were associated with higher levels of pain.²⁶ The different distribution of existing findings in the literature suggests that the effects on HL may be closely related to cultural and health system connections and the characteristics of the groups examined. It has been stated that HL in adolescents can have positive effects on postural habits by contributing to self-efficacy and positive behavioral changes. Minghelli stated that training aimed at increasing HL in adolescents can be a useful tool for preventing and/or minimizing musculoskeletal disorders in adolescents.²⁷ In the present study, which examined the link between these 2 components in young adults, no difference was found between the spinal pain and functionality of individuals with different levels of HL. Considering the positive

effect of HL on lifestyle, postural habits and general well-being, we find this result interesting.²² In addition, there are some studies that have obtained similar results with the current study in different musculoskeletal problems and pain and HL.^{24,25}

The HL levels of the young adults participating in the recent study were found to be limited. The reason for choosing young adults as the sample in this current study was that young adults are the most active group in many areas of life such as social, work and education. In addition, young adulthood is a time of postural habits and lifestyle changes, habits that are likely to predispose to various long-term health problems.⁹ However young adults are a population that has been studied less in terms of HL, and HL studies have focused on older individuals, who are more likely to have health problems.²⁸ Studies examining HL in young adults have yielded different results. A study conducted in 2021 found that 15.3% of participants had inadequate general HL levels and 38.6% had limited HL levels.²⁹ Another study reported that 60.4% of participants had sufficient HL levels.³⁰ It has been stated that these different results in the relevant area may be due to individuals' sociodemographic differences and environmental characteristics.³¹

Young adulthood is an important period in which health-related preventive interventions and habits can be acquired for older ages, and also health-risk habits are acquired. Young adulthood, which is one of the periods in which developing technology and the opportunities it offers are followed the most, also has many advantages in terms of accessing health-related information. In the recent study, a significant number of individuals stated that the first ad-

dress they turn to when they have a health-related issue of interest is the internet. The fact that the internet is constantly accessible, provides useful information, and provides individuals with anonymity can be considered among its most important advantages. This situation is related to the concepts of digital or eHealth literacy, which has been one of the current issues of recent years.³²

The majority of young adult individuals participating in the study stated that they experienced pain in their spine and that they felt this pain mostly in the back, neck, waist and along the entire spine, respectively. This result has been frequently shown in the literature, and it has been stated that neck and waist pain are the most important causes of disability in adults.³³ The cause of spine-related pain in young adult individuals can develop due to many conditions such as physical characteristics, sociodemographic factors, lifestyle habits such as nutrition and physical activity habits, hereditary factors, posture patterns and psychosocial factors.³⁴ Individuals can consciously resort to different solutions for most of these factors, which are changeable or controllable. At this point, the concept of HL gains importance. The role of HL in chronic pain management has been demonstrated, but quite different results have been obtained from studies conducted with similar or different populations in this field.³⁵ These results suggest that the concept of HL is multifaceted and can be affected by many conditions, both individual and environmental. These results show that the concept of HL is multifaceted and can be affected by both individual and environmental conditions. In addition, HL, which is one of the important concepts of recent years, is open to be affected by the developing world and technological opportunities.

The study has several limitations. First of all, although a large sample size was reached for the study, a homogeneous grouping in terms of HL levels could not be obtained in this sample. This makes it difficult to interpret the difference between these groups in terms of spinal functionality. In addition, diseases and surgeries related to the spine health of the participants were not taken into account during the analysis. Although an inquiry about the background of the participants was made by the investigators, including

this inquiry in the analysis may contribute to obtaining different results and interpretations. Finally, although the population of the study was targeted as young adults, the results of the study show that the average age does not cover the entire young adult population. It would be valuable for future similar studies to address a wider age range.

CONCLUSION

This study has shown that there is no relationship between HL and spinal pain and functions in young adults, and that individuals have a limited level of HL. During the young adulthood period, access to health-related information and the ability to use this information are important in order to prevent possible health problems that may occur in the later years of the life cycle. In this respect, it would be valuable to carry out various informative and educational activities in order for HL levels in young adults to reach levels that can be considered sufficient. This current study contributes to the limited existing literature, but future studies that address HL and other health-related outcomes in the young adult population are needed.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: Hilal Aslan, Rabia Tuğba Tekin; **Design:** Hilal Aslan, Rabia Tuğba Tekin; **Control/Supervision:** Hilal Aslan, Rabia Tuğba Tekin; **Data Collection and/or Processing:** Hilal Aslan, Rabia Tuğba Tekin; **Analysis and/or Interpretation:** Hilal Aslan, Rabia Tuğba Tekin; **Literature Review:** Hilal Aslan; **Writing the Article:** Hilal Aslan, Rabia Tuğba Tekin; **Critical Review:** Hilal Aslan, Rabia Tuğba Tekin; **References and Fundings:** Hilal Aslan, Rabia Tuğba Tekin; **Materials:** Hilal Aslan.

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