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Investigation of the relationship between health literacy and rational drug use in university students

A cross-sectional study

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Abstract

Health literacy refers to individuals' ability to use medications safely and effectively. Despite easy access to information, university students often engage in irrational drug use. Understanding the relationship between health literacy and medication practices in this population is essential for promoting safe medication behaviors. This study aimed to assess health literacy among university students and its association with rational drug use, considering sociodemographic variables. A cross-sectional study was conducted with 320 first-year students at Kırşehir Ahi Evran University. Health literacy was measured using the Turkish Health Literacy Scale-32 (THLS-32), and rational drug use was assessed with the rational drug use Scale (RDUS). Descriptive statistics and nonparametric tests were used. Significance was set at $P < .05$. The median age was 20, and 74.1% were female. Most participants were single (96.3%) and had social security (80.6%). The median THLS-32 score was 27.0 (interquartile range: 21.0–36.0), and the median RDUS score was 21.0 (interquartile range: 19.0–24.0). A total of 45.6% had inadequate health literacy, and rational drug use levels were generally low. Health literacy was significantly higher among married students ($P < .05$), and rational drug use was higher among medical students ($P < .05$). Students from the Black Sea region had significantly higher health literacy than those from other regions ($P < .001$). There was no significant correlation between THLS-32 and RDUS scores ($r = 0.02$; $P = .771$). University students demonstrated low levels of health literacy and rational drug use. Sociodemographic factors such as marital status, region, and academic department influenced these outcomes. Educational interventions are recommended to promote health literacy and safe medication practices.

Abbreviations: RDUS = rational drug use scale, THLS-32 = Turkish Health Literacy Scale-32.

Keywords: health literacy, rational drug use, sociodemographic factors, university students

1. Introduction

Health literacy is defined as the cognitive and social skills that determine an individual's ability and motivation to access, comprehend, and effectively utilize health-related information. This concept goes beyond the mere ability to obtain information; it includes understanding and applying this information correctly to make informed decisions that promote individual and public health outcomes.[1] Health literacy is thus recognized as a critical determinant in empowering individuals to manage their own health and interact effectively with healthcare systems.

In Turkey, several national studies have highlighted the prevalence of limited health literacy. The "Turkey Health Literacy Level and Related Factors Survey" conducted by the Ministry of Health reported that among 9541 participants from all 81 provinces, 21.0% had inadequate health literacy, 32.9% had problematic-limited, 34.4% had adequate, and only 11.7% had excellent health literacy levels.[2] Another large-scale study by Tanrıöver et al found the national health literacy index to be 30.4, indicating that 24% of participants had inadequate and 40.1% had limited health literacy.[3]Similarly, a 2019 study using the Turkish Health Literacy Scale-32 (THLS-32) reported that 57.9% of participants had inadequate health literacy.[4]

Parallel to the concept of health literacy, the World Health Organization (WHO) defines rational drug use as a situation in which patients receive medications appropriate to their clinical needs, in the correct dosage, for an adequate period of time, and at the lowest possible cost.[5] Rational drug use emphasizes safe,

Written informed consent was obtained from all participants prior to data collection.

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The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Ethical approval was obtained from the Ahi Evran University Faculty of Medicine Clinical Research Ethics Committee (Decision No. 2025-06/70). This study was conducted in accordance with the Declaration of Helsinki.

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effective, and need-based medication practices. Health literacy plays a pivotal role in achieving rational drug use, as individuals need to understand prescription instructions, recognize side effects, and adhere to treatment plans appropriately.

However, poor health literacy may lead to difficulty accessing healthcare services and increased risk of medication misuse. The WHO estimates that more than half of all medications worldwide are inappropriately prescribed, dispensed, or sold, while nearly 50% of patients fail to use their medications correctly.[5] Furthermore, approximately one-third of the global population lacks access to essential medicines, underlining the significance of informed decision-making in medication use. Research has also shown that individuals with chronic illnesses and low health literacy are at greater risk of making medication errors, which can reduce treatment effectiveness and increase healthcare costs.[6]

In Turkey, the healthcare system is predominantly public and governed by a universal health insurance scheme administered by the Social Security Institution. Almost all citizens are covered under this insurance, granting access to primary, secondary, and tertiary healthcare services with minimal out-of-pocket payments. Understanding this structure is essential in interpreting the health literacy and medication behaviors of university students in this context. Understanding this healthcare structure is essential for interpreting university students' access to medications, their use behaviors, and the role of health literacy in shaping these outcomes.[7]

In light of these findings, improving health literacy is an important public health goal that may contribute to more rational and safer medication use. It is especially vital for healthcare professionals to consider patients' health literacy levels when communicating treatment plans, particularly in populations with chronic diseases.

Despite increasing awareness of the link between health literacy and medication behaviors, limited research exists on this relationship among young adults in academic settings. Therefore, this study aims to assess the health literacy levels of university students and examine their relationship with rational drug use in the context of sociodemographic factors.

2. Materials and methods

2.1. Study design

This descriptive, cross-sectional study was conducted between March 26 and May 10, 2024, at Kırşehir Ahi Evran University. Data were collected through face-to-face interviews with first-year students enrolled in the Faculties of Medicine, Nursing, Engineering, and Teaching who voluntarily agreed to participate.The sample size was determined using the subject-to-item ratio method, which is commonly applied in studies involving structured scales. A minimum ratio of 10 participants per item was adopted to ensure sufficient statistical power. The THLS-32, comprising 32 items, was the longest instrument used in the study. Based on this approach, the required minimum sample size was calculated as 320 participants. This number was met in full, and all participants were included in the final analysis.

2.2. Data collection instruments

Sociodemographic information was collected using a researcher-developed questionnaire covering age, gender, marital status, region of long-term residence, academic department, health insurance coverage, and income level.

2.3. Ethical considerations

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Ethical approval was obtained from the Clinical Research Ethics Committee of Kırşehir Ahi Evran University Faculty of Medicine prior to data collection. (Decision No. 2025-06/70).

2.4. Turkish Health Literacy Scale (THLS-32)

The THLS-32 was developed based on the conceptual model of the European Health Literacy Survey (HLS-EU Consortium, 2012) and adapted for the Turkish population by Okyay, Abacıgil, and Harlak.[8,9] The scale consists of 32 items and aims to assess functional health literacy among individuals aged 15 and above. The scale evaluates the individual's ability to access, understand, evaluate, and apply health-related information in 4 key domains: Treatment and Services and Disease Prevention and Health Promotion. Each of these domains is further assessed across 4 cognitive processes: accessing, understanding, appraising, and applying health information, resulting in a 2 × 4 matrix structure with 8 subdimensions. Items are rated on a 4-point Likert scale ranging from 1 (very difficult) to 4 (very easy). Scores are then standardized using the following index formula: Index = (Mean − 1) × (50/3).

The resulting scores range from 0 to 50, with higher scores indicating better health literacy. Index scores are categorized as follows: 0 to 25: Inadequate health literacy; 25 to 33: Problematic-limited health literacy; 33 to 42: Adequate health literacy; 42 to 50: Excellent health literacy;

The internal consistency of the original Turkish validation study was high (Cronbach's alpha = 0.92), and it remained high in the present study ($\alpha = 0.91$).

Example items include:

"When you have a health complaint, how easy is it for you to find out whether it might be a symptom of an illness?"

"How easy is it for you to understand the instructions on medication labels provided by your doctor or pharmacist?"

"How easy is it for you to find information about preventing diseases like cancer or heart disease through online resources or printed materials?"

2.5. Rational drug use scale (RDUS)

The scale used in this study to assess rational drug use was developed by Demirtaş et al to measure the knowledge levels of adults regarding appropriate and safe medication practices in Turkey.[10] The scale consists of 21 items and was developed based on expert opinion and item analysis. The development process included calculation of item discrimination and difficulty indices, as well as exploratory factor analysis to assess construct validity. The Kaiser-Meyer-Olkin value was 0.836, and Bartlett's test was statistically significant ($P < .001$), indicating sample adequacy and factorability.

The items were constructed based on common behaviors reflecting irrational or inappropriate drug use (e.g., self-medication, improper storage, incorrect dosage). Responses are evaluated using a true/false/don't know format, and scored as:

Correct answer = 1 point.

Incorrect or "don't know" = 0 points.

The total score ranges from 0 to 21, with higher scores indicating better knowledge and awareness of rational drug use principles.

Internal consistency of the scale was satisfactory, with a Cronbach's α of 0.79 in the original validation study and 0.81 in the present study.

Example items include:

"Only physicians are allowed to recommend medications."

"We should inform our doctor if we continue to experience side effects after completing a treatment."

"Using antibiotics without a prescription or when not needed may be harmful."

"Each medication has both benefits and possible side effects."

2.6. Statistical analysis

Data were analyzed using IBM SPSS Statistics version 29.0 (IBM Corp., Armonk). Descriptive statistics were presented as frequencies and percentages for categorical variables, and as medians with minimum–maximum values for continuous data. The normality of continuous variables was assessed using the Shapiro–Wilk test, and nonparametric statistical methods were applied due to the non-normal distribution of the data. The Mann–Whitney *U* test was used for comparisons between two independent groups, while the Kruskal–Wallis test was applied for comparisons among more than two groups. In cases of statistically significant differences, pairwise comparisons were conducted using Bonferroni-adjusted *P*-values as a nonparametric post hoc approach. The relationship between health literacy and rational drug use scores was analyzed using Spearman's rank correlation coefficient. Statistical significance was set at $P < .05$.

3. Results

Table 1 presents the sociodemographic characteristics of the participants. The median age was 20 years (Q_1–Q_3: 19–20), and 74.1% of the students were female. The majority were single (96.3%) and had health insurance (80.6%). Over half of the participants (51.6%) reported having lived primarily in the Central Anatolia region. Regarding academic background, 27.2% were enrolled in the Faculty of Medicine, followed by Nursing (30.0%), Teaching (20.6%), and Engineering (22.2%). More than half (54.7%) evaluated their household income as equal to their expenses.

As shown in Table 2, the median score of the THLS-32 was 27.0 (interquartile range: 21.0–36.0), indicating that nearly half of the students (45.6%) had inadequate health literacy. Only 15.9% of the students achieved excellent literacy levels.

The median score of the RDUS was 21.0 (interquartile range: 19.0–24.0), suggesting low levels of rational medication use based on the threshold value of 34 points.

Table 3 displays the comparison of THLS-32 and RDUS scores across sociodemographic groups. A significant difference was observed in health literacy scores by marital status ($P < .05$), with married students scoring higher. A statistically significant difference was also found in rational drug use scores based on academic department ($P = .036$), with medical students scoring significantly higher than those in other faculties.

Further analysis of the THLS-32 subdimensions is presented in Table 4. The "Treatment and Services" subdimension score significantly differed by region of origin ($P < .001$), with students from the Black Sea region scoring higher than those from Eastern Anatolia, Central Anatolia, and Marmara. Significant differences were also identified by department in the "Disease Prevention and Health Promotion" subdimension ($P = .046$).

As summarized in Table 5, the correlation between overall health literacy and rational drug use was very weak and not statistically significant ($R = 0.02$; $P = .771$).

No significant correlation was found between THLS-32 and RDUS scores among university students ($R = 0.02$, $P = .771$). This weak and nonsignificant relationship is also illustrated in Figure 1.

Table 1

Sociodemographic characteristics of the participants (n = 320).

Variables	Category	n (%)
Age, median (Q_1–Q_3)		20.0 (19–20)
Gender	Male	83 (25.9%)
	Woman	237 (74.1%)
Marital	Single	308 (96.3%)
	Married	12 (3.8%)
Region	Black Sea	24 (7.5%)
	Eastern Anatolia	70 (21.9%)
	Aegean Region	6 (1.9%)
	Southeast Anatolia	19 (5.9%)
	Mediterranean	17 (5.3%)
	Central Anatolia	165 (51.6%)
	Marmara	19 (5.9%)
Department	Medicine	87 (27.2%)
	Nursing	96 (30%)
	Teaching	66 (20.6%)
	Engineering	71 (22.2%)
Social security	I have assurance	258 (80.6%)
	No assurance	62 (19.4%)
Income level	Less	82 (25.6%)
	Equal	175 (54.7%)
	More	63 (19.7%)

4. Discussion

Using a sample of 320 first-year university students in Turkey from diverse academic backgrounds including medicine, nursing, engineering, and teaching this study aimed to assess the level of health literacy and its relationship with rational drug use. In addition to exploring the correlation between these two constructs, we also examined how various sociodemographic factors such as gender, marital status, income level, and region of residence relate to students' health literacy and medication behaviors.

Overall, the findings suggest that a substantial proportion of students had inadequate or limited health literacy, and their rational drug use scores were also relatively low. These results raise concerns about the adequacy of current educational content regarding health and medication use at the university level, particularly for non-health-related faculties. While some of our findings, such as higher scores among medical students and the absence of significant gender differences, align with existing literature, others diverge, underscoring the complexity of health-related behaviors in young adult populations.[11,12] Furthermore, although no significant correlation was observed between health literacy and rational drug use scores, the patterns identified suggest a potential need for more structured health education interventions targeting both constructs simultaneously.

In our study, the mean THLS-32 total score was 28.56. While this score is slightly lower than that reported in previous studies among university students (31.54 ± 11.4), it is comparable to the national average identified in a large-scale study conducted across 23 provinces in Turkey (30.4).[3,13] Given that our sample consisted of students from medicine, nursing, teaching, and engineering faculties groups presumed to have greater access to health information a higher level of health literacy could have been expected. However, the observed similarity with general population scores suggests that significant gaps in health literacy persist even among young, educated populations.

This finding aligns with international research. For instance, Budhathoki et al examined health literacy profiles among health science students in Nepal and found that while students possessed a moderate level of competence in managing their own health, they demonstrated only moderate engagement with healthcare providers and systems. The authors emphasized the need for universities to improve students' access to health information and strengthen their ability to interact actively with health professionals. Doing so would help produce future healthcare professionals who are both health-literate themselves and sensitive to the health literacy needs of the populations they will serve.[14]

Table 2

Descriptive statistics of THLS-32 and RDUS scores.

THLS-32 scale categories	Median (IQR)		Min–Max
THLS-32 scale total score	27.0 (21.0–36.0)		(6–50)
Treatment and service	29.0 (22.0–35.0)		(15.63–50)
Disease prevention & health promotion	28.0 (20.0–34.0)		(10.42–50)
RDUS total score	21.0 (19.0–24.0)		(14–37)
Health literacy categories based on THLS-32	(n, %)	Mean ± SD	Min–Max
Inadequate (0–25)	146 (45.6 %)	19.18 ± 3.51	6–22
Problematic (25–33)	96 (30 %)	29.51 ± 2.58	28–33
Adequate (33–42)	27 (8.4 %)	38.89 ± 2.12	36–39
Excellent (42–50)	51 (15.9 %)	48.15 ± 2.64	44–50

IQR = interquartile range, SD = standard deviation, RDUS = rational drug use scale, THLS-32 = Turkey Health Literacy-32.

Table 3

Comparison of THLS-32 and RDUS scores by demographics.

Demographic	Characteristics	THLS-32 median (min–max)	RDUS median (min–max)
Gender	Woman	27.78 (6.34–50)	21 (14–35)
	Male	27.78 (6.34–50)	20 (14–37)
		U: 9066.5, ‡ $P = .281$	U: 9265.0, ‡ $P = .428$
Marital	Married	44.44 (17.71–50)	20 (18–26)
	Single	27.78 (6.34–50)	21 (14–37)
		U: 966.5, ‡ $P = .004$	U: 1817.0, ‡ $P = .921$
Region	Black Sea	22.22 (6,34–50)	22 (18–35)
	Eastern Anatolia	27.68 (22,47–39,52)	21 (20–32)
	Aegean Region	27.78 (6.34–39,52)	19 (14–29)
	Southeast Anatolia	25.42 (11,25–50)	22 (16–31)
	Mediterranean	25.12 (17,71–50)	21 (14–32)
	Central Anatolia	27.78 (6,34–50)	20 (14–37)
	Marmara	27.78 (17,71–50)	20 (16–34)
		KW:4.38, † $P = .625$	KW:7.44, † $P = .282$
Department	Medicine[1]	27.78 (6,34–50)	22 (14–37)
	Nursing[2]	27.78 (11,25–50)	20 (14–32)
	Teaching[3]	27.78 (6,34–50)	20 (14–35)
	Engineering[4]	27.78 (11.25–50)	21 (16–31)
	* **1–2; 1–3; 1–4**	KW:.971, † $P = .808$	**KW:8.51, † $P = .036$**
Income Level	Less	27.78 (6.34–50)	22 (15–35)
	Equal	27.78 (11.25–50)	20 (14–34)
	More	27.78 (6.34–50)	20 (15–37)
		KW:.621, † $P = .733$	KW:1.78, † $P = .410$

Bold values indicate statistically significant results ($P < .05$).

THLS-32 = Turkey Health Literacy-32, RDUS = rational drug use scale.

†Kruskal–Wallis test.

‡Mann–Whitney *U* test.

*[1–2] Medicine versus Nursing, [1–3] Medicine versus Teaching, [1–4] Medicine versus Engineering (Bonferroni test applied for pairwise comparisons).

Similarly, a study conducted by Rababah et al among university students in northern Jordan showed that health literacy levels were influenced by demographic characteristics and highlighted the essential role of preventive care and health promotion in communities with fewer chronic health issues, such as university populations. The authors advocated for interprofessional education to enhance health outcomes among students and to foster lifelong health literacy competencies.[15]

Taken together, these findings underscore the importance of implementing structured and interdisciplinary health literacy interventions within university settings. Such initiatives may be critical not only for improving the health behaviors of students but also for equipping them to serve as informed professionals who can contribute meaningfully to public health.

A total of 75.6% of participants were found to have inadequate or problematic-limited health literacy. According to the 2025 Ministry of Health report, 54.3% of participants across Turkey were in the same category, while other studies report this figure to be as high as 65%.[2,3] These findings reinforce the importance of developing strategies to strengthen health literacy and support individuals in making informed health-related decisions.

WHO defines rational drug use as providing patients with medications appropriate to their clinical needs, in proper doses, for an adequate period, and at the lowest cost.[5] This study found the mean RDUS score to be 21.65, which is considerably lower than scores reported in other populations: for instance, 34.69 ± 4.60 in a similar study conducted by Duman İ. et al., and a comparable score in elderly outpatients.[16] These differences may be attributed to the younger age and lower prevalence of chronic illness among university students, as well as limited exposure to structured education on rational drug use. International studies also indicate high rates of self-medication among university students, further supporting the notion that irrational drug use is prevalent in this demographic.[17]

Evidence also suggests that structured education improves rational drug use. A study demonstrated a significant increase in students' scores following a rational drug use course, from (35.35) to (37.23).[18] Based on these findings, integrating such courses into university curricula, especially for non-health departments, may contribute to better medication practices.

In terms of gender, our study found no significant difference in THLS-32 scores. This is consistent with some literature.[2,19,20]

Table 4

Comparison of Turkey Health Literacy Scale subdimension levels.

Demographic characteristics		Disease [§] median (min–max)	Treatment [‖] median (min–Max)
Gender	Woman	26.04 (10.42–50)	27.08 (15.63–50)
	Male	28.12 (12.5–50)	28.12 (16.67–50)
		U: 9736.5, [‡] $P = .891$	U: 9003.5, [‡] $P = .251$
Marital	Married	28.64 (16,67–46,88)	31.77 (18.75–50)
	Single	27.08 (10,42–50)	27.07 (15.63–50)
		U: 1299.5, [‡] $P = .081$	U: 1801.0, [‡] $P = .881$
Region	Black Sea[1]	21.87 (17.71–37.50)	27.08 (16.67–41.67)
	Eastern Anatolia[2]	32.81 (31.25–37.50)	28.11 (15.63–50)
	Aegean Region[3]	25.01 (19.79–50)	32.81 (23.96–38.54)
	Southeast Anatolia[4]	24.47 (17.71–50)	23.95 (18.75–47.92)
	Mediterranean[5]	26.56 (16.67–47.92)	21.87 (17.71–50)
	Central Anatolia [6]	28.12 (10.42–50)	20 (14–37)
	Marmara [7]	34.37 (16.67–46.68)	25.01 (19.79–41.67)
	***1–2;1–6;1–7**	KW:9.38, [†] $P = .053$	**KW:19.66, [†] $P < .001$**
Department	Medicine	26.04 (10.42–50)	27.08 (16.67–50)
	Nursing	27.60 (14.58–50)	28.12 (15.63–50)
	Teaching	29.68 (12.50–50)	29.68 (17.71–50)
	Engineering	26,04 (16.67–47.92)	26,04 (16.67–50)
		KW:7.99, [†] $P = .046$	KW:4.66, [†] $P = .201$
Income level	Less	27.60 (12.50–50)	27.08 (15.63–50)
	Equal	26.04 (10.42–50)	27.08 (16.67–50)
	More	28.12 (17.71–50)	28.12 (16.67–50)
		KW:.216, [†] $P = .898$	KW:1.12, [†] $P = .569$

1–2 = Black Sea versus Eastern Anatolia; 1–6 = Black Sea versus Central Anatolia; 1–7 = Black Sea versus Marmara (Bonferroni test was applied for pairwise comparisons). Bold values indicate statistically significant results ($P < .05$).

[†]Kruskal–Wallis test.

[‡]Mann–Whitney *U* test.

[§]Disease prevention and health promotion.

[‖]Treatment and services.

*Bonferroni test.

Table 5

Relationship between THLS-32 and RDUS.

Spearman correlation coefficient	*r*	*P*	n
THLS-32 total score	0.02	.771	320

Correlation coefficient strength (*r*): 0.00–0.25 very weak; 0.26–0.49 poor; 0.50–0.69 moderate; 0.70–0.89 high; 0.90–1.00 very high.

RDUS: rational drug use scale; THLS-32: Turkey Health Literacy Scale.

Other research indicates female students are more health literate.[19,20] The lack of difference in our study may be influenced by factors such as equal access to digital health information and similar educational exposure. Similarly, no significant gender difference was observed in rational drug use, consistent with a systematic review,[21] although other studies have reported differing outcomes.[22] This suggests that the gender-health literacy-drug use relationship may vary across contexts and warrants further investigation.

Marital status was found to be significantly associated with health literacy, with married students reporting higher scores. This could reflect increased health-related responsibility or social support. Other studies have also shown higher literacy and rational drug use scores among married individuals,[6] although contrasting findings exist.[23,24] These variations highlight the complexity of sociodemographic influences and the importance of examining such factors across diverse populations.

No significant association was found between income level and health literacy or rational drug use in our sample, aligning with findings by Okyay and Abacıgil.[25] However, other literature suggests that higher income may enhance access to information and healthcare services.[26]

Geographical disparities in health literacy were evident in our study, with students from the Black Sea region scoring higher in the "Treatment and Services" subdimension. The European Health Literacy Survey also reported substantial cross-country variation, with higher literacy levels in countries like Germany and Austria, and lower levels in Bulgaria and Greece, likely due to differences in healthcare access, education, and information availability.[27] Enhanced awareness and health education efforts in the Black Sea region could explain the relatively better outcomes observed.

Findings from Özcan et al further support the notion that rural areas face greater challenges in rational drug use, including limited access to information and higher rates of non-prescribed medication use.[28] These patterns indicate the need for targeted health education and service access strategies in underserved regions.

A significant difference was found in rational drug use scores based on students' academic departments, with medical students scoring higher than peers in nursing, engineering, and teaching. This finding contrasts with a study reporting no significant departmental differences among health sciences students,[29] but aligns with another study showing that nursing students demonstrated greater attention to dosage and timing.[22] These discrepancies suggest that both the depth and delivery of curriculum content may influence outcomes.

A weak, nonsignificant correlation was found between health literacy and rational drug use in this study. This contrasts with other research showing a positive association,[30,31] indicating that improved health literacy can support more informed medication behaviors. The limited association

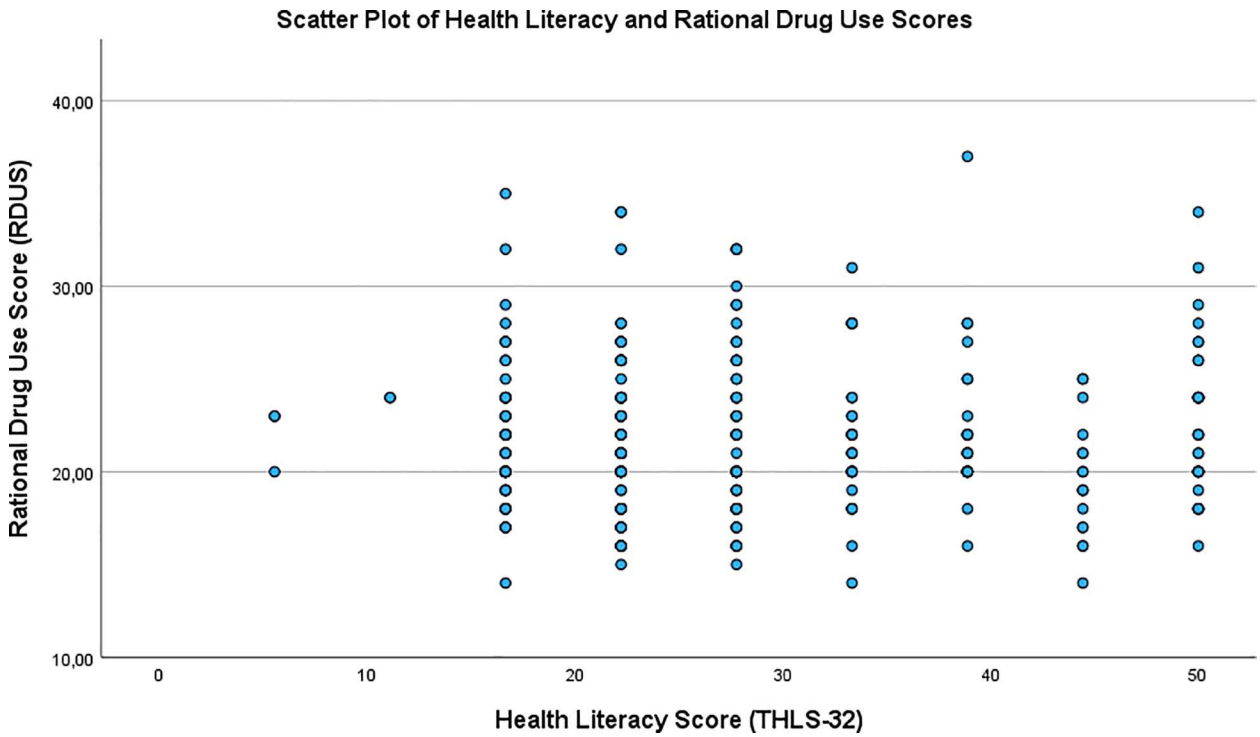

Figure 1. Scatter plot showing the relationship between health literacy (THLS-32) and rational drug use (RDUS) scores among university students (n = 320). There was no significant correlation between THLS-32 and RDUS scores (Spearman's $\rho = 0.02$, $P = .771$). RDUS = rational drug use scale, THLS-32 = Turkish Health Literacy Scale-32.

observed here may reflect the need for more comprehensive health education among young adults.

5. Conclusions

This study revealed that most university students demonstrated inadequate levels of health literacy and rational drug use. Although access to information is widespread among young adults, informed decision-making about medication remains insufficient.

While no gender-based differences were observed, marital status was associated with higher health literacy. Additionally, students from the Faculty of Medicine exhibited more appropriate drug use behaviors, suggesting that targeted health education influences outcomes. Regional disparities were also noted, with students from the Black Sea region displaying higher health literacy in some subdimensions.

The findings underscore the importance of integrating health literacy and rational drug use education into university curricula, particularly for students in nonmedical programs. Tailored interventions addressing regional and sociodemographic differences are also recommended. Future research should evaluate the impact of such educational programs and further investigate the relationship between health literacy and medication behaviors in diverse populations.

6. Limitations

This study has several limitations. It was conducted at a single university, which may limit the generalizability of the findings to other regions or institutions. The cross-sectional design prevents the establishment of causal relationships between health literacy and rational drug use. Additionally, self-reported measures are subject to response biases. Future studies with longitudinal designs and broader samples are recommended to validate and expand upon these findings.

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References

[1] Çopurlar Kendir C, Kartal M. What is Health Literacy? How to measure it? Why is it important? Turkish J Family Med Primary Care. 2016;10:40–5.
[2] Özkan S. Turkey Health Literacy Level and Related Factors Survey: Ministry of Health Press, Ankara, 2018.
[3] Ozdemir H, Alper Z, Uncu Y, Bilgel N. Health literacy among adults: a study from Turkey. Health Educ Res. 2010;25:464–77.
[4] Özdemir S, Akça HS, Algın A, Kokulu K. Health literacy in the emergency department: a cross-sectional descriptive study. Health. 2020;19:94–7.
[5] Sisay M, Mengistu G, Molla B, Amare F, Gabriel T. Evaluation of rational drug use based on World Health Organization core drug use indicators in selected public hospitals of eastern Ethiopia: a cross sectional study. BMC Health Serv Res. 2017;17:1–9.
[6] Akyol Güner T, Kuzu A, Bayraktaroğlu T. The relationship between health literacy and rational drug use in individuals with diabetes. Turk J Diab Obes. 2020;4:214–23.
[7] Health TMo. Health Statistics Yearbook 2023 (English edition) of the Turkish Ministry of Health. 2024. https://ekutuphane.saglik.gov.tr/Ekutuphane/kitaplar/SİY2023_İngilizce(31.01.2025).pdf.

[8] Consortıum H. Comparative Report on Health Literacy in Eight EU Member States. The European Health Lıteracy Survey Hls-Eu, Onlıne Publıcatıon: https://centreforliteracy.ie/wp-content/uploads/2012/09/HLS-EU_report_Final_April_2012.pdf. 2012. Accessed September 5, 2025.
[9] Abacigil F, Beşer E, Baran Deniz E, et al. Türkiye sağlık okuryazarlığı ölçekleri güvenilirlik ve geçerlilik çalışması. 2016.
[10] Demirtaş Z, Dağtekin G, Sağlan R, et al. Akilci ilaç kullanimi ölçeği geçerlilik ve güvenilirliği. ESTÜDAM Halk Sağlığı Dergisi. 2018;3:37–46.
[11] Vozikis A, Drivas K, Milioris K. Health literacy among university students in Greece: determinants and association with self-perceived health, health behaviours and health risks. Arch Public Health. 2014;72:15.
[12] Health literacy of nursing students and its effective factors. Nursing forum; 2019. Wiley Online Library.
[13] Bánfai-Csonka H, Bánfai B, Jeges S, Betlehem J. Understanding health literacy among university health science students of different nationalities. Int J Environ Res Public Health. 2022;19:11758.
[14] Budhathoki SS, Pokharel PK, Jha N, et al. Health literacy of future healthcare professionals: a cross-sectional study among health sciences students in Nepal. Int Health. 2019;11:15–23.
[15] Rababah JA, Al-Hammouri MM, Drew BL, Aldalaykeh M. Health literacy: exploring disparities among college students. BMC Public Health. 2019;19:1401.
[16] Duman I, Karadağ S. Rational drug use in older adults and the influencing factors: a cross-sectional study. Geriatrik Bilimler Dergisi. 2024;7:117–25.
[17] Malli IA, Hubayni RA, Marie AM, et al. The prevalence of self-medication and its associated factors among college students: cross-sectional study from Saudi Arabia. Prev Med Rep. 2023;36:102457.
[18] Aslan S, Çinar E, Ertürk NE, Baysal P. Investigation of the relationship between rational drug use and healthy lifestyle behaviours of university students. Global Health Promotion. 2023;30:23–30.
[19] Ozkaya B. Investigation of health literacy levels of nursing students and affecting factors. Int J Caring Sci. 2019;12:270–79.
[20] Kühn L, Bachert P, Hildebrand C, et al. Health literacy among university students: a systematic review of cross-sectional studies. Front Public Health. 2022;9:680999.
[21] Fetensa G, Tolossa T, Etafa W, Fekadu G. Prevalence and predictors of self-medication among university students in Ethiopia: a systematic review and meta-analysis. J Pharm Policy Pract. 2021;14:107.
[22] Kuyifatih A, Yenimahalleli Y, Günaltay M. Rational drug use: an application in Ankara University Faculty of Health Sciences. Fsecon. 2022;6:251–77.
[23] Gül I, Yeşiltaş A, Şahin S. The relationship between healthy life style behaviors and health literacy: a study on university students. J Int Health Sci Manag. 2019;5:26–43.
[24] Yılmaz E, Çimen M. Health literacy, healthy lifestyle behaviours and physical activity in sports sciences faculty students: a mediation analysis. Turkish Journal of Sport and Exercise. 2025;27:167–76.
[25] Okyay P, Abacigil F. Sağlık okuryazarliğinin ölçülmesi. Turkiye Klinikleri Public Health-Special Topic. 2019;5:10–5.
[26] Göde A, Öztürk YE, Kuşcu FN. Examining the relationship between E-Health literacy and rational drug use: a study on university students. J Int Health Sci Manag. 2023;9:8–16.
[27] Sørensen K, Pelikan JM, Röthlin F, et al; HLS-EU Consortium. Health literacy in Europe: comparative results of the European health literacy survey (HLS-EU). Eur J Public Health. 2015;25:1053–8.
[28] Özcan FY, Koçoğlu-tanyer D. Kırsal Alanda Yaşayan Bireylerin Akılcı İlaç Kullanım Özellikleri. Hemşirelikte Araştırma Geliştirme Dergisi 2023;25:1–20.
[29] Gözen EB, Saydamlı S, Er MN. Sağlik bilimleri fakültesinde öğrenim gören öğrencilerin akilci ilaç kullanim durumlarinin değerlendirilmesi. Tıp Fakültesi Klinikleri Dergisi 2022;7:97–117.
[30] Yılmaz CK, Kıl A. Individuals' health literacy level and their knowledge and practices with respect to rational drug use. Kontakt. 2018;20:e401–e07.
[31] İskender MD, Özcan E, Gülsoy A, Uyan Y. Yetişkin bireylerde akilci ilaç kullanimi öz farkindaliği ile sağlik okuryazarliği arasindaki ilişki: kesitsel bir araştirma. Turkish J Family Med Primary Care 2023;17:512–20.