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Research Article

EFFECTS OF E-HEALTH LITERACY ON RATIONAL DRUG USE: THE MEDIATING ROLE OF HEALTH PERCEPTION

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Abstract: *Rational drug use can make important contributions to treating diseases. Many factors affect rational drug use. This research was undertaken to define the mediating role of health perception (HP) in the effect of e-health literacy (eHL) on rational drug use (RDU). The research presented here was performed between March 11 and April 29, 2023, in the Istanbul and Kocaeli provinces and their districts in Türkiye. Data were collected from individuals residing in Istanbul and Kocaeli provinces or their districts aged 18 and over by online survey method. A total of 520 questionnaires were collected in this process. The findings revealed that eHL positively affects HP. Moreover, eHL and HP positively affect RDU. Finally, it was determined that HP has a mediating role in the effect of eHL on RDU. The research presented here has confirmed that eHL and HP are determinants of RDU. According to these results, some suggestions are presented.*

Keywords: *Internet, e-Health Literacy, Health Perception, Rational Drug Use*

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1. Introduction

While drugs help prevent and treat diseases when used rationally, the irrational use of drugs can lead to serious dangers that threaten human health and may even result in death [1]. Factors such as population growth increase in the prevalence rates of chronic diseases, epidemics, income inequalities, problems in accessing health services, easier access to drugs, increases in both the number and variety of available drugs, and lack of sufficient knowledge and awareness of individuals about drugs have made the rational use of drugs an issue of crucial importance worldwide [2]. Rational drug use (RDU) has been defined as "patients receive medications appropriate to their clinical needs, in doses that meet their requirements, for an adequate period of time, and at the lowest cost to them and their community" [3].

RDU helps achieve positive treatment outcomes, prevent adverse drug effects, reduce drug treatment costs, increase individuals' quality of life, and improve public health [4, 5]. However, individuals may engage in irrational drug use for reasons such as easy access to drugs, availability of some drugs without a prescription, problems in accessing health services, lack of social security, lack of awareness, lack of education, and economic hardships [6, 7]. Individual behaviors such as self-medication, not taking all of the drugs prescribed, not utilizing drugs at the time or in the dose suggested by the physician, and interrupting drug treatment are behaviors of irrational drug use [8, 9]. Irrational drug use may lead to decreased adherence to treatment, adverse drug interactions, increased resistance

to certain drugs, the prolongation or recurrence of the disease, and increased treatment costs [10, 11]. RDU is associated with sociocultural factors, economic conditions, legal regulations and policies, the demographic characteristics of individuals, income and education levels, and the general health literacy level of society [12, 13].

Another factor associated with RDU is e-health literacy (eHL). Developments such as the advancement of information technologies, widespread adoption of internet usage, and increased access to the internet have led to the concept of eHL [14]. eHL may be described as "the ability to seek, find, understand, and appraise health information from electronic sources and apply the knowledge gained to addressing or solving a health problem" [15]. Today, huge amounts of information of all types can be accessed quickly and easily on the internet [16]. However, accurate information is not always available on the internet. Information obtained from internet sources may be inaccurate, misleading, or of low quality [17]. eHL is very important in being able to access the right health-related information on the internet and interpreting it correctly [18]. High levels of eHL allow individuals to access accurate information about health issues online, make better-informed health decisions, and engage in positive health-related behaviors [19].

Another factor associated with RDU is health perception (HP) [20]. The concept of HP includes individuals' assessments and beliefs about their health [21, 22]. HP is subjective and differs from person to person. People may perceive themselves as being healthy despite having a chronic disease, or they may perceive themselves as being ill despite having no symptoms of any disease [23]. The HPs of individuals who live in different conditions and have different characteristics in society may also differ [24]. Many variables including age, gender, education and income levels, marital status, and beliefs affect HP [25, 26]. HPs have a significant influence on the ability of an individual to change his or her own behaviors [27]. HPs are also important in protecting health, deciding to adopt and exhibit healthy life behaviors or avoid risky behaviors, and improving health [28, 29].

In the relevant body of literature, the number of studies conducted to date to determine the relationships between eHL HP and RDU is low. It is thought that determining the relationships between these variables will contribute to the literature. With that in mind, the present research was planned with the aim of determining the mediating role of HP in the effect of eHL on RDU. The hypotheses developed for that purpose were as follows:

H_1: eHL positively affects HP.
H_2: eHL positively affects RDU.
H_3: HP positively affects RDU.
H_4: HP has a mediating role in the effect of eHL on RDU.

2. Materials and Methods

The research presented here was performed between March 11 and April 29, 2023, in the Istanbul and Kocaeli provinces and their districts in Türkiye. Data were collected from individuals residing in Istanbul and Kocaeli provinces or in their districts aged 18 and over by online survey method. A total of 520 questionnaires were collected in this process.

While 61% (n=317) of the respondents were female, 39% (n=203) were male. The average age of these participants was 33.50±10.95 years. Among all participants, 21.5% (n=112) had received high school education or below, 22.5% (n=117) had an associate degree, 42.9% (n=223) had an undergraduate degree, and 13.1% (n=68) had received postgraduate education. While 48.7% (n=253) of the participants were not married, 51.3% (n=267) were married. Finally, 71.9% (n=374) of the participants were employed and 28.1% (n=146) were unemployed.

2.1. Measurements

The initial section of the questionnaire form that was administered for the collection of study data was designed to gather information regarding the demographic characteristics of the respondents. The following scales constituted the remainder of the questionnaire:

- *The e-Health Literacy Scale (e-HEALS):* Norman and Skinner developed the e-HEALS, which includes a single dimension and 8 items [30]. Coşkun and Bebiş confirmed the scale's validity and reliability in the Turkish context [31]. The scale is structured as a 5-point Likert-type scale, with items being assigned scores that range from 1 ("Strongly Disagree") to 5 ("Strongly Agree"). The scale was confirmed to be reliable for the purposes of the present study (α=0.761).
- *Perception of Health Scale (PHS):* Diamond et al. developed the PHS, which includes 15 items distributed across a total of 4 dimensions that include the center of control with 5 items, self-awareness with 3 items, certainty with 4 items, and importance of health with 3 items [32]. Kadıoğlu and Yıldız conducted the Turkish validity and reliability study of the PHS [33]. The statements of the PHS are evaluated with a 5-point Likert-type scale, with items being assigned scores that range from 1 ("Strongly Disagree") to 5 ("Strongly Agree"). Of the 15 items, 6 items are evaluated with positive statements and 9 items with negative statements. The items evaluated with negative statements are subsequently reverse-coded by the researchers. The scale was confirmed to be reliable for the purposes of the present study (α=0.672).
- *Rational Use of Drugs Scale (RUDS):* Cengiz and Ozkan [34] developed the RUDS, which constitutes a single dimension containing 21 items that are evaluated with a 5-point Likert-type scale that ranges from 1 ("Never") to 5 ("Always"). The 17th item of this scale is reverse-coded. In its application in the present study, the RUDS was found to possess a high level of reliability (α=0.845).

2.2. Statistical Analysis

IBM SPSS Statistics 22.0 and Process Macro v4.0 were applied in the present work for all statistical analysis. In this process, calculations of descriptive statistics were performed and correlation and effect analyses were utilized in evaluating relationships between variables. The findings of these analyses were evaluated within the framework of 95% confidence intervals at a significance level of 5%.

2.3. Ethical Statement

All procedures undertaken in the research described here were approved by the Human Research Ethics Committee of Yalova University, which confirmed that the study was ethical (Protocol No: 2023/46, Date: 10.03.2023).

3. Results

Based on the findings obtained from the correlation analysis of the study data, a positive correlation exists between eHL and HP (r=0.530). In addition, correlations of a positive nature were observed to exist between both eHL and RDU (r=0.544) and HP and RDU (r=0.517) (Table 1).

Table 1. Correlation Analyses

Variables	$\bar{X}$	SD	1	2
1. e-Health Literacy	3.670	0.455		
2. Health Perception	3.601	0.403	0.530*	
3. Rational Drug Use	3.956	0.458	0.544*	0.517*

*p<0.001

The results of the analysis confirmed that eHL positively affects HP (β=0.470, p<0.001). Moreover, eHL (β=0.379, p<0.001) and HP (β=0.360, p<0.001) positively affect RDU. These results supported hypotheses H_1, H_2, and H_3 (Table 2).

Table 2. Effect Analyses

Effect	β	S.E.	t	p	LLCI	ULCI
Constant	1.875	0.122	15.347	0.000	1.635	2.115
eHL → HP	0.470	0.033	14.237	0.000	0.405	0.535
Constant	1.266	0.157	8.060	0.000	0.958	1.575
eHL → RDU	0.379	0.042	9.128	0.000	0.298	0.461
HP → RDU	0.360	0.047	7.689	0.000	0.268	0.452

eHL: e-Health Literacy, HP: Health Perception, RDU: Rational Drug Use

The results of the analysis confirmed that HP has a mediating role in the effect of eHL on RDU (β=0.169) and also creates further increases the positive effect of eHL on RDU (β=0.549, p<0.001). These findings supported the fourth hypothesis (Table 3).

Table 3. Analysis of the Mediating Role of Health Perception

Effect		β	S.E.	t	p	LLCI	ULCI
Direct Effect	eHL→RDU	0.379	0.042	9.128	0.000	0.298	0.461
Indirect Effect	eHL→HP→RDU	0.169	0.023			0.126	0.216
Total Effect	eHL→RDU	0.549	0.037	14.770	0.000	0.476	0.622

eHL: e-Health Literacy, HP: Health Perception, RDU: Rational Drug Use

4. Discussion

The research presented here has revealed that eHL has a positive impact on HP. Previous studies in the relevant body of literature have confirmed the existence of a positive relationship between health literacy and HP [35, 36]. Kıbrıs and Kızılkaya showed that eHL positively affects HP [37]. Individuals can access virtually endless amounts of information about health on the internet. However, they must have sufficient eHL levels to understand and apply that information correctly. High levels of eHL will positively affect individuals' perceptions of health and lead them to be more conscious about health and exhibit more positive health-focused behaviors.

Another important finding of this research was the positive impact of eHL on RDU. Tosun and Hoşgör showed a positive relationship between eHL and awareness of RDU [38]. Yalman and Tosun

showed that health literacy positively affects RDU [13]. The results of the mentioned studies support the findings of the present work. Low levels of health literacy may cause individuals to experience problems and make mistakes in drug use [39]. The present work has demonstrated that individuals with high levels of eHL have appropriate attitudes toward RDU.

Another finding of this work was the positive impact of HP on RDU. Çifçi et al. showed a positive relationship between HP and RDU [40]. HP is one of the factors affecting individuals' positive attitudes about and behaviors to support their own health and their willingness to take responsibility [41]. It can be said that individuals with high HP levels will likely show the necessary care and sensitivity in their use of drugs. The present study has likewise demonstrated that individuals with positive HP exhibit behaviors appropriate for RDU. According to the results obtained in this study, HP has a mediating role in the effect of eHL on RDU. Adequate eHL levels support the development of positive HPs on the individual level. In turn, positive individual HPs indirectly increase the positive effect of eHL on RDU.

5. Conclusion

The research presented here has confirmed that eHL and HP are determinants of RDU. According to these results, some suggestions are presented. To increase the level of eHL, courses should be given in schools, and training sessions should be organized for the community. Trustworthy websites should be created to increase the eHL of the public. Mechanisms should be established to monitor the accuracy of the health information available online. Additionally, institutional websites should be created where the public can access accurate and safe health information. To foster the public's positive perceptions of health, awareness of the importance of health should be raised through training, news, and television programs. Efforts should be made to make individuals sensitive to health issues. It should also be ensured that individuals take responsibility for their own health. Social awareness should be raised to increase the prevalence of appropriate attitudes toward RDU. The public should be informed about RDU. Health policies should be developed and legal regulations should be established for RDU. Health professionals should inform patients in detail about how, when, and at what dose they should take their drugs.

6. Limitations

The fact that this study was carried out only in two provinces and the districts of these provinces is a limitation of the study. Another limitation is that the feasibility of comparing the results of this study with the findings of previous research is relatively limited due to the low number of studies conducted to date to describe the relationships between eHL HP and RDU.

Ethical Statement:

All procedures undertaken in the research described here were approved by the Human Research Ethics Committee of Yalova University, which confirmed that the study was ethical (Protocol No: 2023/46, Date: 10.03.2023).

Conflict of Interest:

The author declared that there is no conflict of interest.

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Authors' Contributions:

The study has been prepared by the author.

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