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Individuals' health literacy level and their knowledge and practices with respect to rational drug use

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ABSTRACT

This descriptive study aimed to identify individuals' health literacy level and their knowledge and practices with respect to rational drug use. The study was conducted with 405 individuals aged 18 and above who applied to a hospital. Data were collected by using an introductory information form and the Adult Health Literacy Scale (AHLS). Data were analyzed by using the Mann–Whitney *U* test for comparing two groups and the Kruskal–Wallis *H* test for comparing the mean total scale scores of more than two groups. We found that participants' average age was 34.25 ± 14.8; 55.5% of them were female; 50.5% had university education or higher; 51% were married. Their mean AHLS score was 14.03 ± 4.32 over 23. Our study found that individuals that used non-prescribed drugs had a lower mean AHLS score (12.16 ± 4.00), and the individuals that read the drug prospectus (p = 0.000) and expiry date (p = 0.000) had higher mean AHLS scores. For those who changed the drug dose prescribed by a doctor (p = 0.001) and those who stopped medication when the disease symptoms were gone (p = 0.031), the mean AHLS scores were lower at a statistically significant level. We found that participants had a moderate level health literacy and there was a negatively significant relation between age and health literacy scores. The study results indicated that there was a significant relation between their knowledge and practices with respect to rational drug use and health literacy level. Our suggestion is to assess individuals' health literacy and to plan initiatives for increasing their awareness regarding rational drug use and health literacy.

Introduction

Today, individuals are expected to have the skills to access health-related information, use health services accurately and take responsibility for their own health to protect and promote health [1]. In order to realize this expectation, individuals need to have an adequate level of health literacy so that they access and understand health information and communicate with health service providers in the processes of diagnosis, treatment and rehabilitation and health protection [1, 2]. Health literacy includes individuals' skills needed to understand and process health information such as knowing how to use health services, developing health behaviors, increasing treatment adherence, using drugs accurately, understanding the given information, and

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making decisions on self-care and disease management [1.3]. Regardless of the development level of countries around the world, reports indicate that the health literacy level is low. A study in Turkey found that 64.6% of our people had an "inadequate" (24.5%) or "problematic" (40.1%) health literacy level [4].

Low health literacy is an important public health problem that affects individuals' overall health and increases disease-related problems. Inadequate health literacy can cause many problems such as an increased number of hospitalizations, increased use of emergency care services, receiving less preventive health care, failure to use drugs accurately or regularly, insufficiency in managing chronic diseases, inability to understand health-related messages, and the waste of limited sources for health expenditure [5–7]. In addition to those problems, the literature reported that inadequate health literacy had undesirable health outcomes such as lower medication adherence, increased medication errors and irrational drug use [7, 8, 9]. Jin et al. [10] reported that a high level of health literacy contributed to therapeutic compliance. Marvanova et al. [11] reported that people with lower health literacy had lesser understanding of medication regimen. Zhang et al. [8] found a significant relationship between health literacy and medication adherence. The study by İncesu [9] found that individuals' health literacy and awareness regarding rational drug use were inadequate.

According to the World Health Organization, drug use is rational "when patients receive the appropriate medicines, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost both to them and the community" [12]. In this respect, irrational drug use causes patients not to get sufficient benefits from drugs, which leads to medication errors and places a big burden on national economy [13]. The study by Yapıcı et al. [14] found that 26% of their participants took drugs without medical advice, 15% took the drugs they had at home, and 43.7% stopped the medication before the prescribed period. While irrational drug use, which is considered to be a habit that is hard to fix, is more common in less developed and developing countries, it stands out as a serious health problem for all countries [13]. Increasing individuals' health literacy is crucial for changing this habit.

Higher health literacy is effective in promoting community health, and individuals must improve their health literacy starting from the childhood period [15]. Nurses have an important task in promoting health literacy as they provide health service for all age groups in society and play an active role in promoting community health. Nurses are the health professionals who spend the longest time with the individuals in protective, curative and rehabilitative services. In this scope, nurses provide health education in many subjects so that individuals can understand and manage their chronic diseases, use their medication properly, adopt healthy life-style behaviors, and have the diet suitable for their diseases. It is doubtless that individuals' health literacy level is important in attaining desirable outcomes with health education. In that case, the nurses must first determine the health literacy level of the community they serve and then plan and apply the health education programs that aim to improve health literacy accordingly [15, 16]. This is expected to increase people's medication adherence and rational drug use by increasing their health literacy awareness, and ensure more effective disease management and effective communication with health professionals. For obtaining those positive health outcomes and shaping the nursing education services, it is very important for nurses to assess individuals' health literacy and their knowledge and practices regarding rational drug use. However, our country has a limited number of studies assessing health literacy level and the knowledge and practices regarding rational drug use [9]. Therefore, we planned this study with the aim of assessing individuals' health literacy level and the knowledge and practices regarding rational drug use.

Materials and methods

This study aimed to determine the health literacy level and the knowledge and practices regarding the rational drug use of individuals aged 18 and above. This descriptive study was conducted in the Aksaray Training and Research Hospital of Aksaray University. Study universe consisted of individuals aged 18 and above who had applied to the hospital between December 2017 and March 2018. The study sample covered 405 individuals who applied to the clinics during the study period and consented to participate in the study.

Data collection

Study data were collected by using the Adult Health Literacy Scale and an introductory information form, which was prepared by the researcher by reviewing the literature and which included questions for identifying the participants' socio-demographic features and rational drug use behaviors [9, 13]. Researchers collected the study data through the face-to-face interview technique in approximately 20 min in a suitable environment. First, the researchers explained the study objectives and then applied the survey to the individuals who agreed to participate.

Introductory information form: This form included 22 questions; 6 questions were about the participants' demographics and medical status (age, gender, marital status, education status, chronic diseases, medication) and 16 questions were about rational drug use.

Adult Health Literacy Scale (AHLS): This scale was developed by Sezer and Kadıoğlu [17] and its validity and reliability was tested. It includes 22 items on drug use and health information for identifying adult health literacy level, and 1 figure which requires knowing organs' place in the body. 13 items in the scale are yes/no questions; 4 items are for filling in the blanks; 4 items are multiple-choice questions; and 2 items are for matching. The scoring was made separately for each question type. For the yes/no questions, those who marked the positive answer received 1 point, while those who marked the negative answer received 0 points. For filling in the blanks questions, the correct answers received 1 point, while the wrong answers

received 0 points. For the multiple-choice questions, those who marked two and more correct answers received 1 point, while those who gave wrong answers or those who gave both correct and wrong answers received 0 points. For the matching questions, those who made two or more correct matches received 1 point, while the rest received 0 points. The scores one can get from the scale varied between 0 and 23. As one's health literacy level increased, one's score from the scale increased [17].

Data analysis

Study data were evaluated using the SPSS statistics program. The descriptive features of study participants were evaluated by using number, percentage, mean and standard deviation. Since the data did not have a normal distribution, the Mann–Whitney *U* test was used for comparing two groups, and the Kruskal–Wallis *H* test was used for comparing the mean total scores of more than two groups, $p < 0.05$ was the level of statistical significance.

Results

Participants' average age was 34.25 ± 14.8, 55.5% of them were female; 50.5% had university education and higher; 51% were married; 24.4% had at least one chronic disease. We found that as participants' age increased, their mean AHLS scores decreased ($r = -0.377$, $p = 0.000$); and as their education level increased, their mean AHLS scores increased. Married individuals had a lower mean AHLS score (13.07 ± 4.45) than single ones (15.08 ± 3.93). When we compared the mean AHLS scores according to socio-demographic features, we found a statistically significant difference between age ($p < 0.001$), education level ($p < 0.001$) and marital status ($p < 0.001$) and the mean AHLS scores (Table 1).

We found that 31.2% of participants went to a doctor promptly in case of any sickness. According to the assessment of drug use behaviors; 47.2% of participants answered "yes/sometimes" to the question "Do you use non-prescribed drugs without consulting a doctor"; the most common drugs used without consulting a doctor were common cold and influenza drugs (65%) and analgesics (45.8%); 10.9% of participants recommended drugs to others (Table 2). The participants who used non-prescribed drugs had a lower mean AHLS score (12.16 ± 4.00), and the difference was statistically significant ($p = 0.008$, Table 3).

Table 1 – Comparison of participants socio-demographic features and mean AHLS scores (*N* = 405)

Variables	*N*	%	AHLS mean scores			Statistical value *Z/p*
			Mean	*SD*	Min–Max	
Age						
18–34 years	238	58.8	15.52	3.72	6–23	$Z = -8.129$
35 years and above	167	41.2	11.92	4.24	1–21	$p = 0.001$
Sex						
Female	225	55.5	14.22	4.37	1–23	$Z = -1.251$
Male	180	44.5	13.83	4.26	4–23	$p = 0.211$
Education level						
Not literate	40	9.9	8.79	3.40	1–16	$\chi^2 = 53.33$
Literate	79	19.5	11.56	3.91	4–21	$p = 0.000$
Elementary	81	20.1	12.55	3.36	7–20	
University and above	204	50.5	16.01	3.50	7–21	
Marital status						
Married	207	51	13.07	4.45	2–23	$Z = -4.796$
Single	198	49	15.08	3.93	1–21	$p = 0.000$

SD = standard deviation.

Our study found that 55.3% of participants took medication regularly; 50.3% read the prospectus of their drugs; 64.1% checked the expiry date of drugs; 84% got drugs only from pharmacies, 44% checked whether the drug they got was the one prescribed; 27.2% had information on the foods not to be taken with drugs. However, 46.8% stopped medication when the disease symptoms were gone, and 8% changed drug dose without consulting a doctor. While taking medication, study participants paid attention to being hungry or full (84.8%), medication times (44.7%), drug doses (43.7%), drug interactions (14.1%) and alcohol interaction (9.4%). When drugs caused adverse effects, the majority of individuals applied to the doctor (83.6%) but 15.1% either stopped the medication or changed the dose on their own (Table 2).

We found that participants' mean AHLS score was 14.03 ± 4.32. When we compared participants' mean AHLS scores according to their rational drug use behaviors, we found that the ones who read the drug prospectus ($p = 0.000$) and expiry date ($p = 0.000$), the ones who checked whether the drug they got was the one prescribed ($p = 0.000$) and the ones who had information on drugs' food interactions ($p = 0.000$) had higher mean AHLS scores, and the difference between the mean AHLS scores was statistically significant. We found that the mean AHLS scores of the individuals who changed the drug dose advised by a doctor ($p = 0.001$) and stopped the medication

Table 2 – Individuals' rational drug use characteristics (*N* = 405)

Variables	*N*	%
What is your first action when you get sick*		
Go to a doctor promptly	126	31.2
Go to a doctor if I do not get better	206	51.0
Take a drug	32	7.9
Take a herbal remedy	76	18.9
Do you use non-prescribed drugs without consulting a doctor?		
Yes	48	11.9
Sometimes	142	35.3
No	214	52.8
What drugs do you use without consulting a doctor*		
Analgesics	178	45.8
Common cold drugs	253	65.0
Dermatologic drugs	81	20.8
Allergy drugs	53	13.6
Eye drops	104	26.7
Do you recommend drugs to others?		
Yes	44	10.9
Sometimes	124	30.7
No	236	58.4
Do you take your drugs regularly?		
Yes	223	55.3
Sometimes	123	30.3
No	59	14.4
Do you read the drug prospectus?		
Yes	201	50.3
Sometimes	103	25.8
No	96	23.9
Do you read the expiry date of drugs?		
Yes	260	64.1
Sometimes	55	13.7
No	90	22.2
Do you stop the medication when disease symptoms have gone?		
Yes	189	46.8
Sometimes	114	28.1
No	102	25.1
Do you change drug doses without consulting a doctor?		
Yes	35	8.7
Sometimes	66	16.3
No	304	75.0
Do you buy drugs from non-pharmacy sources?		
Yes	37	9.2
Sometimes	28	6.8
No	340	84.0
Do you check whether the drug you get is the one written on the prescription?		
Yes	178	44.0
Sometimes	87	21.4
No	140	34.6
Do you have information on the foods that should not be taken with drugs?		
Yes	110	27.2
Sometimes	118	29.0
No	177	43.8
What are the things you consider while taking drugs*		
Being hungry or full	339	84.8
Medication times	179	44.7
Drug dose	175	43.7
Drug interactions	56	14.1
Alcohol interaction	37	9.4
What do you do when a drug has an adverse effect*		
Consult a physician	336	83.6
Consult a nurse	14	4.0
Consult a pharmacist	27	7.2
Stop the medication or change dose without consulting anyone	59	15.2

* Participants can mark more than one answer.

Table 3 – Comparison of the mean scores of AHLS according to some drug use characteristics of individuals (*N* = 405)

Variables	AHLS mean scores			Statistical value *Z*/*p*
	Mean	*SD*	Min–Max	
Do you use non-prescribed drugs without consulting a doctor?				
Yes	12.16	4.00	1–20	$\chi^2 = 9.578$
Sometimes	14.40	3.65	6–22	$p = 0.008$
No	14.20	4.69	2–23	
The use of analgesics without consulting a doctor				
Yes	13.86	4.70	1–23	$Z = -0.228$
No	14.04	4.07	4–22	$p = 0.820$
Use of cold medicines without consulting a doctor				
Yes	14.37	3.89	4–22	$Z = -1.893$
No	13.36	4.88	1–23	$p = 0.058$
Do you recommend drugs to others?				
Yes	13.72	4.26	4–21	$\chi^2 = 4.647$
Sometimes	14.81	3.92	7–22	$p = 0.098$
No	13.64	4.51	1–23	
Do you read the expiry date of drugs?				
Yes	15.15	4.06	4–23	$\chi^2 = 55.843$
Sometimes	13.25	3.78	6–21	$p = 0.000$
No	11.19	4.03	1–21	
Do you take your drugs regularly?				
Yes	14.08	4.44	1–23	$\chi^2 = 2.316$
Sometimes	14.33	3.97	4–21	$p = 0.314$
No	13.07	4.53	4–21	
Do you stop the medication when the disease symptoms have gone?				
Yes	13.53	4.24	1–23	$\chi^2 = 6.967$
Sometimes	15.04	4.09	4–21	$p = 0.031$
No	13.78	4.59	4–21	
Do you read drug prospectus?				
Yes	15.65	3.82	7–23	$\chi^2 = 85.01$
Sometimes	14.04	4.02	4–21	$p = 0.000$
No	10.62	3.68	1–20	
Do you change drug doses without consulting a doctor?				
Yes	11.02	4.40	1–19	$\chi^2 = 14.811$
Sometimes	14.01	3.94	5–21	$p = 0.001$
No	14.36	4.27	2–23	

SD = standard deviation.

when disease symptoms had gone ($p = 0.031$) were lower at a statistically significant level. In addition, there was a statistically significant difference between individuals' mean AHLS scores according to their attention to being hungry or full, medication times, doses, drug interactions and alcohol interaction while taking medication ($p = 0.000$, Table 3).

Discussion

Today, health literacy level stands out as a key factor for using health care services accurately and efficiently and ensuring that individuals can protect and sustain their health and manage their diseases. In this aspect, health literacy is very important in treatment adherence, the accurate use of recommended drugs and rational drug use practices, hence in the successful treatment of diseases. Therefore, our study aimed to identify individuals' health literacy level and their knowledge and practices with respect to rational drug use.

The studies in the literature reported that the health literacy level decreased in parallel with increased age and lower education level [4, 18, 19]. Similarly, our study found that there was a negatively significant relation between ($r = -0.377$, $p = 0.000$) age and the mean AHLS score, and as education level increased, the mean AHLS score also increased. Durusu Tanrıöver et al. [4] reported that health literacy decreased with increased age, and the individuals with a lower education level had inadequate health literacy. Another study reported that advanced age and low education level caused inadequate health literacy [18]. Gazmararian et al. [20] reported a significant relation between age and education level and inadequate health literacy level. It was considered that advanced age and low education level had a negative effect on the individuals' understanding and learning performances, reasoning skills, problem solving, communication and self-care, hence causing inadequate health literacy [21, 22].

Our study found that married individuals had a lower mean AHLS score than single ones. Similarly, the study by Kaya and Uludağ [18] found that married individuals

had a lower mean health literacy score compared to single ones. In contrast to those results, there were studies in the literature reporting that married individuals had higher health literacy levels compared to single ones [23, 24]. Çimen and Bayık Temel [24] reported that married individuals, compared to single ones, had higher health literacy scores, and it might be because spouses shared their health information and supported each other.

In our study, the participants' mean AHLS score was 14.03 ± 4.32. In our country, one study, which took the European Health Literacy (HLS-EU) scale as a basis, reported that 64.6% of the community were in the "problematic or inadequate" health literacy category, and the mean overall health literacy index score was 30.4 (4). In the study by Çaylan et al. [23], the mean AHLS score was 13.26 (max. 23) and this figure might be considered low. In the study by Nesbitt et al. [25] made with 612 patients over the age of 18 with cardiac failure, the mean health literacy score was 25.5 (max 36). The study by Ozdemir et al. [26] reported that the inadequate health literacy level was 41% in adults. In the literature, since the studies evaluating health literacy used different scales, the values given for health literacy level seemed to differ. However, it can be said that individuals' health literacy levels varied because factors such as age, gender, education level, occupation, socio-economic status, cultural characteristics and social factors affected health literacy [18, 27]. Therefore, it is important to prepare the nursing education programs for promoting health literacy by considering the individuals' socio-cultural features.

It was reported that health literacy affected individuals' rational drug use, treatment adherence, and information and practices with respect to drug use [7–10]. While there are many studies in the literature assessing individuals' rational drug use behaviours, there was only one study examining the relation between rational drug use and health literacy [9]. Studies in the literature mainly examined the effect of health literacy on medication adherence and medication errors. In our study, 47.2% of participants answered "yes/sometimes" to the question of "Do you use non-prescribed drugs without consulting a doctor", and their mean AHLS score was lower than other groups (p = 0.008). The study by İncesu [9] reported that 48.6% of patients took the drugs at home without visiting a doctor and had inadequate awareness regarding rational drug use. Noureldin et al. [28] found that patients with adequate health literacy had better medication adherence compared to those without it. The results of our study were similar to the ones in the literature. Improving health literacy helps individuals to understand their drugs' effects (and adverse effects) and to use their drugs regularly in the correct doses and for the proper periods. In this sense, it is essential to improve individuals' health literacy level to change the habit of using drugs randomly without consulting a doctor.

Our study found that 50.1% of participants read the drug prospectus; 64.1% checked drugs' expiry date; and the ones who read the drug prospectus (p = 0.000) and expiry date had higher (p = 0.000) mean AHLS scores. The study by Haney and Kudubeş [29] reported that 44.3% of participants read the drug prospectus and 49.2% checked drugs' expiry date. Another study found that the majority of patients read the drug prospectus (69.9%) and checked the expiry date (79.5%) [9]. This can be explained by the high education level of study participants. Being able to understand and interpret the information in a drug prospectus is effective in making people read it. We might expect a good level of health literacy from the individuals who can understand the information in a drug prospectus and the risks that may occur when expired drugs are used.

Our study found that the mean AHLS scores of the individuals who changed the drug dose prescribed by the doctor (p = 0.001) and who stopped medication when disease symptoms were gone (p = 0.031) were lower than other participants. On the other hand, the mean AHLS scores of the individuals who paid attention to being hungry or full, medication times, drug dose, drug interactions and alcohol interaction were higher than the ones who did not pay attention to these (Table 3). Topuz and Özkan [30] reported that there was a negative relation between parents' health literacy level and medication errors, and parents with lower health literacy made more medication errors. Another study reported that individuals with inadequate health literacy could not understand the information given on their disease and misused their asthma drugs, and did not administer inhaler drugs [31]. The literature reported that limited health literacy was associated with medication non-adherence, medication errors, higher medical expenses and increased hospitalization [32]. Identifying health literacy level and planning initiatives to improve on the low health literacy will extend rational drug use by individuals and improve the treatment of diseases by ensuring that individuals understand the drug information correctly and by increasing treatment adherence. Therefore, it is crucial to increase the awareness of all individuals providing or receiving health care with respect to health literacy and rational drug use.

This study indicated that individuals' health literacy level is important for ensuring rational drug use. In that respect, it is important to promote a community's health literacy starting from childhood. We think that nurses will contribute to promoting health literacy and rational drug use by increasing the community's health literacy to the desirable level by incorporating the interventions that will increase health literacy level into the health education programs that they prepared for health promotion [15].

Limitations of the study

The limitation of this study was that the study sample consisted of individuals that applied to a hospital so the results could not be generalized.

Ethical considerations

Before beginning this study, we received written approval from the Non-invasive Human Researches Ethics Council of Aksaray University (2018/18) and from the institutions where we conducted the study. Before applying the data collection tools, the researchers informed the participants of the study objectives and stated that participation in the study was on a voluntary basis. Informed written

consents were received from the individuals who agreed to participate in the study.

Conclusion

In this study, we found that individuals' health literacy was at a moderate level and there was a negatively significant relation between age and the mean health literacy score. The majority of participants did not promptly consult a doctor when they got sick, used non-prescribed drugs without consulting a doctor, changed drug dose, and stopped the medication when the disease symptoms were gone. There was a significant relation between individuals' knowledge and practices with respect to rational drug use and their health literacy level. Therefore, all health professionals working in preventive and curative health institutions, particularly the nurses, who play a role in the safe administration and monitoring of drugs, should assess individuals' health literacy, and initiatives should be planned for improving health literacy. In addition, we recommend including the topics of health literacy and rational drug use in the health education programs with the purpose of building awareness regarding rational drug use and health literacy.

Conflict of interests

The authors declare no conflict of interests regarding this paper.

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