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The Health Literacy Level among Adult Patients in Rural and Urban Public Health Centers of Pandalungan Region: A Dual-Center Comparative Study

Sofyan Nurdiansyah¹, Nurfika Asmaningrum^{2*}, Retno Purwandari³ Anisah Ardiana⁴,
Kholid Rosyidi Muhammad Nur⁵

^{1,2,3,4,5} Faculty of Nursing, University of Jember, East Java, Indonesia

*Corresponding Author: nurfika_asmaningrum@unej.ac.id

ABSTRACT

Introduction: Health literacy is an important component to ensure healthy behavior which is a determinant to a person's health and life quality. Health literacy contributes to improving a person's health to make healthy lifestyle choices, prevent disease, seek information about appropriate treatment, and determine the best remedies to treat a disease. **Objective:** This study was aimed to determine the differences in the level of adult patients' health literacy in rural and urban health centers in Pandalungan region in Jember regency, East Java, Indonesia. **Methods:** The study was designed as comparative descriptive research. Purposive sampling was conducted on 216 adults who visited two public health centers (henceforth PHCs) in rural and urban areas which were determined based on the highest visitors of 2019 in each rural and urban region. Data was collected using HLS-EU-16Q. The data analysis were descriptive analysis, Mann Whitney U Test, and chi-square test. The level of statistical significance was set at $p < 0.05$. **Results:** The study found a significant difference in the level of health literacy among adults who visited urban and rural PHCs ($p < 0.001$). The level of health literacy in respondents who visited PHCs urban areas (132.29) was higher than those who visited PHCs rural areas (84.71). The three sub domains of health literacy showed a significant difference between rural and urban areas ($p < 0.001$). The location of PHCs, age, education level, and occupation were the factors associated with health literacy level. **Conclusion:** Our findings highlight the impact of geographical areas as a driving variable to the level of adults' personal health literacy. The role of the rural-urban areas affects the individual skills and abilities as the precursor to health literacy. Thus, reducing health literacy barriers is an essential element for promoting health equity, which further can reduce health disparities and promotes the human rights principles of nondiscrimination and equality.

ABSTRAK

Latar belakang: Literasi kesehatan merupakan komponen penting untuk memastikan determinan perilaku kesehatan dan kualitas hidup seseorang. Literasi kesehatan berkontribusi untuk meningkatkan kesehatan seseorang untuk dapat mempengaruhi pilihan gaya hidup sehat, mencegah penyakit, mencari informasi tentang pengobatan yang tepat, dan cara mengobati penyakit yang dialami. Oleh karena itu, literasi kesehatan diakui sebagai penentu kesehatan dan pendukung yang dapat mengembangkan kesehatan masyarakat pedesaan dan perkotaan. **Tujuan:** Penelitian ini bertujuan untuk mengetahui perbedaan tingkat literasi kesehatan pasien di Puskesmas pedesaan dan perkotaan di wilayah Pandalungan. **Metode:** Desain penelitian deskriptif komparatif dengan menggunakan teknik purposive sampling pada 216 orang dewasa yang mengunjungi dua puskesmas di pedesaan dan perkotaan. Pengumpulan data dilakukan dengan menggunakan kuesioner literasi kesehatan. Teknik analisis data menggunakan analisis univariat dan bivariat. Literasi kesehatan merupakan temuan utama, analisis deskriptif, uji Mann Whitney, dan uji chi-square digunakan untuk menganalisis data. Tingkat signifikansi statistik ditetapkan pada $p < 0.05$. **Hasil:** Studi menemukan perbedaan tingkat literasi kesehatan yang signifikan antara masyarakat yang berkunjung ke puskesmas perkotaan dan pedesaan ($p < 0.001$). Tingkat literasi kesehatan pada responden yang berkunjung ke puskesmas perkotaan (132,29) lebih tinggi dibandingkan responden yang berkunjung ke puskesmas pedesaan (84,71). ketiga subdomain literasi kesehatan menunjukkan perbedaan yang signifikan antara pedesaan dan perkotaan ($p < 0.001$). Jenis wilayah puskesmas, tingkat usia, tingkat pendidikan, dan pekerjaan merupakan faktor yang berhubungan dengan tingkat literasi kesehatan. **Kesimpulan:** Temuan kami menyoroti dampak deliniasi wilayah geografis sebagai variabel pembeda yang secara signifikan mempengaruhi tingkat literasi kesehatan pribadi orang dewasa. Peran daerah pedesaan-perkotaan berpengaruh pada keterampilan dan kemampuan individu yang mempengaruhi literasi kesehatan. Dengan demikian, mengurangi hambatan literasi kesehatan diakui sebagai elemen penting untuk mempromosikan kesetaraan kesehatan yang selanjutnya dapat mengurangi kesenjangan kesehatan dan mempromosikan prinsip-prinsip hak asasi manusia tanpa diskriminasi dan kesetaraan. Literasi kesehatan adalah solusi masalah kesehatan di masyarakat untuk mengendalikan kesejahteraan mereka sendiri dengan membuat pilihan perawatan kesehatan yang baik. Tampaknya perlu untuk merancang dan mengimplementasikan berbagai program pendidikan untuk meningkatkan literasi kesehatan umum.

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Introduction:

The potential for gaining health and well-being across the people's lifespan is the vision of healthy people 2030. Healthy people 2030 is the fifth edition of 10-year healthy people goals after 2000, 2010, and 2020. To maintain health and well-being for all, one of its overarching goals highlights the values of "eliminating health disparities, achieving health equity, and attaining health literacy. Of these components, health literacy (HL) is a central focus of healthy people 2030 (Office of Disease Prevention and Health Promotion, 2021). Thus, to increase health equity and reduce health disparities, an essential element in the effort is eliminating health literacy barriers (Logan et al., 2015).

HL is an important component to ensure healthy behavior which is a determinant to a person's health and life quality (Nurjanah & Mubarokah, 2019). Health literacy is the extent to which individuals attain, manage, and understand health information and apply that information in health decision making (Parker et al., 2003; Fleary et al., 2018). Health literacy has been described as both a 'risk factor' and an 'asset'. On the other hand, as an asset, health literacy can be seen as a means to empower individuals and communities to exert greater control over their health and over a wide range of social and environmental determinants of health. Health literacy has a big role in improving one's health. If an individual has a fairly good health literacy, it can influence the choice of a healthy lifestyle on a daily basis, prevent a disease, and seek information about appropriate treatment and medical care for treating a disease (Berkman et al., 2011).

HL is also seen as an important policy issue as it is central to public healthcare quality, cost, safety, and informed decision making. Equally relevant to health disparities are the human rights principles of nondiscrimination and equality. Health disparities are differences in health status when compared to the population overall, often characterized by such indicators as

higher incidence of disease and/or disability, increased mortality rates, lower life expectancies, and higher rates of pain and suffering.

One of the factors affecting the level of health literacy is demographic conditions. Based on the density of population, development, amenities, employment opportunities, education, etc., human settlement is majorly divided into two categories i.e., urban and rural areas. Based on demographic conditions, in the eastern part of East Java province there are Pandalungan region which are divided into three groups, West Pandalungan (Pasuruan and Probolinggo), East Pandalungan (Situbondo and Bondowoso), and South Pandalungan (Lumajang, Jember, and Banyuwangi). Among the Pandalungan region, Jember is the most attractive city for growth among others (Zoebazary, 2017). The term "Pandalungan" is a form of cultural assimilation between Javanese and Madurese as local community identity, which has high level of kinship and potential of social cohesion.

According to the data from the Central Bureau of Statistics of Jember regency in 2014 there were 49 Public Health Centers (PHCs) in the working area of Jember regency, East Java, Indonesia. Of these public health centers, 6 PHCs were located in urban areas, and the remaining of 43 PHCs located in rural areas. According to data from the most visitors on PHCs in 2019, the PHC of Tanggul represented the highest visitors in rural areas, incorporating 176.326 people. Meanwhile, the urban areas were represented by the PHC of Patrang with the number of visitors incorporated 93.073 people. People in rural and urban areas tend to have different characteristics. People in rural areas are relatively calm and gentle, and they tend to be communal; while those in urban areas have a mentality and personality type that is more dynamic, materialistic, and individual (Zoebazary, 2017). Such demographic conditions

contribute to the differences between rural and urban communities. Thus, the comparison between the two is worth further investigation. When the level of health literacy in rural and urban communities is low, they will face more challenges in their health problems, one of which is the issues in accessing various kinds of information and using the health service system. This proves that health literacy still remains problematic. Literacy is an important component to ensure healthy behavior which is a determinant to a person's health and life quality (Nurjanah & Mubarokah, 2019). Thus, predicting a person's ability to understand basic health information calls forth appropriate health decisions, and that requires a satisfactory health literacy level. Therefore, this study aimed to determine differences in the level of patient health literacy in rural and urban health centers in Jember regency.

Methods:

The study was a descriptive comparative analysis gathered from dual centers of PHCs, each of which represented the rural and urban area of Pandalungan region in Jember regency, East Java, Indonesia. The research sample was conducted by purposive sampling on 216 adults who visited two public health centers as representative of rural and urban areas which were determined based on the data on the most visitors in each region. The samples were determined using inclusion and exclusion criteria. The inclusion criteria were: 1) aged >20 years, 2) willing to participate in the study, 3) registered at Public Health Centers in urban areas or rural areas of Pandalungan region in Jember regency, 4) Adult patients with vision or hearing impairments and pediatric patients were excluded.

The research employed a questionnaire on public health literacy (HLS-EU 16Q), which consists of three indicators: health care, disease prevention, and health promotion, with a total of 16 questions with the following choices: very difficult, fairly difficult, easy, and very easy. The results of

the validity and reliability test documented Cronbach's Alpha of 0.77 and item total correlation ranging from 0.432 to 0.640 with r Alpha value >0.3. These statistics implied that the HLS-EU 16Q were valid and reliable (Nurjanah et al., 2016). The data collection was carried out from September to October 2020 and the second was carried out in August-September 2021 at Tanggul Health Center and Patrang Health Center, Jember regency. The data was obtained by distributing public health literacy questionnaires and visiting both PHCs. Statistical analysis was operated by a computer system. Univariate analysis was presented in the distribution frequency table (f) and percentages. Data were also presented as mean and standard deviation (SD) as well as a median and interquartile range (Q1-Q3) for each subdomain of health literacy. While bivariate analysis a non-parametric test was operative, the Mann Whitney U Test was used to determine the difference between 2 independent groups. A chi-square test was used for analyzing the type of area Public Health Center, gender, age level, education level, and occupation to determine the contributing factors toward health literacy level. Value of $p < 0.05$ was the threshold to identify significant differences.

Prior to collecting data, the first author approached patients who met the inclusion criteria by visiting them at the Public Health Center and explained the objective and nature of the study. Participants were assured of confidentiality and anonymity. If the patient agreed to participate in the study, they signed a written informed consent form. Ethical approval for this study was obtained from the Faculty of Nursing, Jember University with reference number 26/UN25.1.14/KEPK/2020.

Results:

The study involved 216 respondents who visited the PHCs in rural and urban areas which were divided proportionally between each area as shown in Table 1. Most of the respondents who visited rural PHC

were aged 21-27 years (31.5%), predominantly female (66.7%), gained high school education (37%), and worked as entrepreneurs (27.8%). Some participants revealed that they rarely used the access to health information from TV, internet and radio. Meanwhile, the characteristics of respondents who visited the urban PHC's

were mostly 21-27 years old (39.8%), mostly female (51.9%), and earned high school education (45.4%). Some respondents indicated that they often used the access to health information from TV, internet, and radio.

Table 1. Demographics of participants visiting rural and urban PHCs in Pandalungan region (n=216)

Urban (n=108)		Demographic characteristics	Rural (n=108)	
Frequency	Percentage		Frequency	Percentage
Age (years)				
43	39.8	21 – 27	34	31.5
20	18.5	28 – 32	24	22.2
21	19.4	33 – 39	23	21.3
24	22.2	40 – 65	27	25.0
Gender				
52	48.1	Male	36	33.3
56	51.9	Female	72	66.7
Education level				
0	0	Not completed	11	10.2
1	0.9	Elementary school	10	9.3
5	4.6	Junior high school	23	21.3
49	45.4	High school	40	37.0
13	12.0	Diploma	7	6.5
40	37.0	Bachelor	17	15.7
Occupation				
6	5.6	Unemployed	11	10.2
3	2.8	Farmer	27	25.0
28	25.9	Entrepreneur	30	27.8
25	23.1	Civil servant	16	14.8
18	16.7	Private employee	16	14.8
28	25.9	Student	8	7.4
Health Information Access (TV)				
36	33.3	Often	25	23.1
50	46.3	Sometimes	39	36.1
22	20.4	Seldom	43	39.8
0	0	No answer	1	0.9
Health Information Access (Internet)				
62	57.4	Often	36	33.3
31	28.7	Sometimes	35	32.4
14	13.0	Seldom	32	29.6
1	0.9	No answer	5	4.6
Health Information Access (Radio)				
3	2.8	Often	2	1.9
5	4.6	Sometimes	13	12.0
70	64.8	Seldom	75	69.4
30	27.8	No answer	18	16.7

Table 2. Sub-domain of Health Literacy across two PHCs in rural and urban areas

Urban (n=108)								Sub Variable	Rural (n=108)							
Mode	Median	Q1	Q3	Min-Max	SD	Mean		P	Mean	SD	Min-Max	Q3	Q1	Median	Mode	
7	7	6	7	3-7	1.131	6.31		Health Care (<i>p</i> <0.001)	5.33	1.658	0-7	7	4	6	7	
5	5	3	5	1-5	1.285	4.05		Disease Prevention (<i>p</i> <0.001)	3.08	1.692	0-5	5	2	3	5	
4	4	3	4	1-4	0.815	3.49		Health Promotion (<i>p</i> <0.001)	2.78	1.285	0-4	4	2	3	4	
16	15	12.2	16.00	7-16	2.872	13.84		Health Literacy	11.19	3.631	3-16	14.00	8.00	15.00	16	

The measures of HL consist of three sub-domains: health care, disease prevention, and health promotion. Of three sub domains, the respondents in urban areas tend to have higher HL mean scores than those in rural areas. The overall mean score of HL shows that mean score of HL of adults visiting urban PHC is 13.84, which is classified as adequate, meanwhile adults visiting PHC in rural areas mark a mean score of 11.19, classified as problematic. The three sub domains of health literacy document a significant difference between rural and urban areas (*p*<0.001) (Table 2).

Table 3. Health Literacy Levels across two PHCs in rural and urban areas (n=216)

Urban (n=108)		Health Literacy	Rural (n=108)	
Frequency	Percentage		Frequency	Percentage
9	8.3	Inadequate	28	25.9
18	16.7	Problematic	34	31.5
81	75.0	Adequate	46	42.6

Table 3 displays the HL levels among respondents who visited PHCs in rural and urban areas. In majority, the respondents in urban PHC have adequate HL, and less than 10% respondents have inadequate HL.

Although a similar pattern is evident among those in rural PHC, nearly a half of rural respondents have adequate HL and a quarter (25.9%) of respondents have inadequate health literacy.

Table 4. Comparative Analysis of Health Literacy between Rural and Urban PHCs (n=216)

	N	Mean Rank	P-Value
Rural Health Literacy	108	84,71	< 0.001
Urban Health Literacy	108	132,29	

In comparative analysis, HL among those visiting the urban and rural PHCs is marked with a significant difference. The Mann Whitney U Test documented average rural health literacy level at 84.71 and urban health literacy at 132.29. According to the non-parametric test (*p* < 0.001), there was a significant difference in the health literacy scores between Rural and Urban Public Health Center (Table 4).

Table 5. Contribution of demographic factors to health literacy level

Characteristics	Options	Health Literacy				X ²	p- Value		
		Inadequate		Problematic				Adequate	
		N	%	N	%	N	%		
Area	Urban	9	8.3	18	16.7	81	75.0	24.326	<0.001
	Rural	28	25.9	34	31.5	46	42.6		
	Total								
Gender	Male	14	15.9	22	25.0	52	59.1	.184	0.912
	Female	23	18.0	30	23.4	75	58.6		
	Total								
Age (years)	21 – 27	5	6.5	14	18.2	58	75.3	28.153	<0.001
	28 – 32	10	22.7	11	25.0	23	52.3		
	33 – 39	4	9.1	12	27.3	28	63.6		
	40 – 65	18	35.3	15	29.4	18	35.3		
	Total								
Education level	Not completed	9	81.8	1	9.1	1	9.1	108.491	<0.001
	Elementary school	8	72.7	3	27.3	0	0.0		
	Junior high school	9	32.1	14	50.0	5	17.9		
	High school	8	9.0	25	28.1	56	62.9		
	Diploma	3	15.0	4	20.0	13	65.0		
	Bachelor	0	0.0	5	8.8	52	91.2		
	Total								
Occupation	Unemployed	1	5.9	5	29.4	11	64.7	87.415	<0.001
	Farmer	19	63.3	9	30.0	2	6.7		
	Entrepreneur	10	17.2	23	39.7	25	43.1		
	Civil servant	3	7.3	5	12.2	33	80.5		
	Private employee	3	8.8	8	23.5	23	67.6		
	Student	1	2.8	2	5.6	33	91.7		
	Total	37	17.1	52	24.1	127	58.8		

To explore the factors toward health literacy level among adults who visited rural and urban PHCs in the Pandalungan region, all variables were included in the analysis as independent variables using chi-square test. The results displayed on Table 5 showed that the location of PHC, age, education level, and occupation were statistically significant differences ($p < 0.05$). Hence, these variables were associated with health literacy level among adults who visited rural and urban PHCs in Pandalungan region.

Discussion:

The study investigated personal health literacy differences across the two groups of adult patients who sought health care at PHCs in rural and urban areas in Jember. The selected PHCs represented the regional characteristics with regard to the first layer

of each rural and urban area on the site. Personal HL refers to the degree of individuals having the ability to find, understand, and use information and services to make health-related decisions and take necessary measures for themselves and others (Office of Disease Prevention and Health Promotion, 2021).

The findings showed that there are differences in health literacy between rural and urban PHCs. This finding was supported by Golboni et al., (2017) who found that health literacy was lower among rural people, compared to their counterparts in urban areas. Another study by Wang et al., (2020) stated that health literacy status was different between urban and rural areas. Higher levels of comprehensive health literacy in urban areas are commonly acknowledged in previous works. The level

of health literacy in rural and urban communities is affected by multiple determinants. In terms of personal characteristics, health literacy is predicted by age, race, gender, socioeconomic status, education, occupation, and income. The determinants of society and the environment including demographic conditions, culture, language, and community systems as well as social determinants (Sorensen et al., 2012).

Univariate results in this study indicate that health literacy in urban areas is higher than that in rural areas. This is related to the demographic conditions in urban areas characterized with plenty of access to health information. The use of adequate media is crucial in the course of various information, especially health information. As such, urban communities have high health literacy. High health literacy makes people have greater control in improving and maintaining their health (Marinda, 2019). This study is supported by Wang et al., (2020) mentioning that health literacy status has a clear difference between urban and rural areas which shows a higher level of comprehensive health literacy in urban areas.

On the other hand, this study indicates that health literacy in rural areas tends to be lower than that in urban areas. This study is consistent with the research by Zahnd et al., (2009), which points out that rural residents have lower literacy rates for all literacy types. Low health literacy can be a barrier to accessing and receiving safe and effective healthcare. Those with low health literacy are also more likely to make medication errors, for example, due to misinterpreting labels and health messages, being unable to identify medication and misunderstanding instructions. Low health literacy therefore has negative impacts on the implementation of health management plans, self-management of disease and individual health behaviors, and health outcomes. Low health literacy is associated with higher use of the emergency department, more hospitalizations, and lower rates of preventive health service. Furthermore, those

with lower health literacy are more likely to hesitate to seek remedies when sick, resulting in delayed diagnosis and treatment even at more advanced stages of disease. This results in higher morbidity and mortality rates.

The health literacy in urban and rural areas is believed to have a significant relationship with the differences in demographic characteristics between these areas, especially on inequalities in socioeconomic levels and geographical conditions, namely the distance to health care centers and remote population settlements (Golboni et al., 2017). Health literacy is a solution to health problems in the community to take control of their own well-being by making good healthcare choices. The study suggests various designs and implementations of educational programs to improve general health literacy. Culturally appropriate interventions, using principles of health literacy in community-based settings, can result in improved health literacy at the population level.

Health literacy is intrinsically linked to both individuals and a community's socioeconomic context and is deemed a powerful mediator to the social determinants of health. Of other evidence-based strategies, health literacy interventions are viable options to address social adversity and environmental health determinants to reducing health disparities, which fosters health equity and social justice (Logan et al., 2015). Health literacy has been used to describe the ability of individuals to locate, interpret, and apply health information for decision making. In seeking appropriate and relevant health information, one should have the ability and skills in obtaining information, such as how to access, search, identify, find, read, understand, evaluate, and utilize the information obtained. In the healthcare system, there are still some people with inadequate health literacy in dealing with disease problems, such as chronic diseases.

As the study was conducted during the first wave of pandemic COVID-19, a previous study in China found that rural residents were less likely to perform preventive behaviors, more likely to hold a negative attitude toward the effectiveness of performing preventive measures. In addition, they had lower levels of information appraisal skills than urban residents. We identified information appraisal as a significant factor that might contribute to the rural/urban differences in preventive behaviors against COVID-19 (Chen et al., 2019).

The study was limited in several ways. As the data collection occurred during the early wave of the COVID-19 pandemic, it impacted on decreased adult patients who visited the public health centers in both areas. Thus, the study samples could not be carried out using random sampling techniques which affected generalization.

Conclusion:

The study has confirmed that the HL of adult patients in urban PHC are significantly higher than those in rural PHC of Pandalungan region. Rural communities have inadequate health literacy compared to urban communities who have adequate health literacy. Meanwhile, the ratio of health literacy in urban communities is higher than those in rural communities. To reduce health disparities, it is important to manage the HL differences across the rural and urban communities, which further improves health equity. The healthcare organization plays a role in providing health-related information to improve health literacy. Thus, the health professionals have a key role for creating health-literate communities.

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