Assessing Health Literacy of Elderly with Chronic Diseases during the COVID-19 Pandemic in Makassar City, Sulawesi Selatan, Indonesia

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ABSTRACT
The elderly are vulnerable to experience health problems and physical deterioration characterized by high rates of chronic diseases among the elderly. Health literacy ability becomes crucial for the elderly with chronic diseases to treat and maintain their health. This study was aimed to describe the literacy levels of the elderly with chronic diseases during the COVID-19 pandemic in Makassar. The method of study was a descriptive survey with a cross-sectional study. The research population is elderly with chronic diseases in Makassar city, and the samples are 124 elderly with age ≥60 years old and suffering chronic diseases more than six months in two selected sub-district. The research was conducted a cross-sectional survey, and descriptive univariate data analysis was used. The instrument was used Indonesia's health literacy short-form survey questionnaire (HLS-EU-SQ10-IDN). The result of this study reveals that the health literacy levels vary: insufficient criteria by 33.99%, problematic criteria by 49.2%, sufficient criteria by 16.1%, and perfect criteria by 0.8%. The results prove that the health literacy level of the elderly with chronic diseases is insufficient. This study concluded that the dominant level of the health literacy of the elderly with chronic diseases is inadequate and problematic. Health education program to improve their literacy is necessarily improved during the COVID-19 outbreak.

Keywords: health literacy, elderly, chronic diseases, COVID-19

INTRODUCTION

It is predicted that the growth of the elderly group progressively increases all over the world. The data show that the elderly's total increased by 901 million in 2015 from 697 million in 2000. It is predicted that the elderly's total will increase by 56% or 1.4 billion in 2030 (1). Furthermore, this trend occurs in Indonesia, and it is predicted that 65-years-old and over elderly increases from 5.0% to 10.6% (2). The latest data shows that in 2014 the total number of elderly in Indonesia was 20.24 million, or 8.03% of the whole Indonesian population (3). The increase of the elderly occurs in Sulawesi Selatan Province and particularly in Makassar City. The data show that the total

number of elderly in Sulawesi Selatan was 8.9% in 2015, while the total number of elderly in Makassar was 9.26 of the whole population in 2016. It shows that the total percentages of elderly in Sulawesi Selatan and Makassar are higher than the national percentage by 7.6 %. (4,5). This high number of elderly indicates that health literacy crucially requires further review.

Elderly face various problems to maintain their health condition and compression of chronic diseases. The role of health literacy is significant for the treatment and medication of the elderly with chronic illnesses. This study reveals that self-management education and health literacy programs can significantly increase medication adherence of elderly

with primer hypertension (6). Furthermore, this study's result reveals that the mental condition of the elderly with diabetes mellitus strongly relates to their health literacy, particularly on several statuses, such as nutrition, physical activities, and treatment adherence in diabetes mellitus (7).

The social phenomena indicate that access to health services for the elderly during the COVID-19 outbreak is nearly difficult because the government appeals to the elderly not to visit health facilities to prevent the spread of COVID-19. It results in the elderly's insufficient comprehension of health and medication information. The condition is worsened by several facts that the elderly cannot access the information on online platforms. Furthermore, society's real condition shows that health staff do not consider the elderly's health literacy level when delivering health education for the elderly with chronic diseases.

A study investigating the health literacy prevalence of the elderly in Indonesia has not been massively conducted. Meanwhile, the investigation on several previous studies shows that a study on health literacy has never been conducted in Makassar. Makassar is a city/regency with the highest number of elderlies in Sulawesi Selatan and on the national average. This study is necessarily conducted to provide data on the health literacy of the elderly to develop literacy media and health education for the elderly with chronic diseases.

METHOD

This study employed a quantitative approach with a descriptive survey of a cross-sectional study to describe the literacy levels of the elderly with chronic diseases during the COVID-19 pandemic in Makassar. The population of this study was the elderly with chronic diseases in Makassar, Sulawesi Selatan. Meanwhile, this study was conducted in two Public health centres, Puskesmas Tamalanrea Jaya dan Puskesmas Rappokalling Kota Makassar, from July to June 2020. The samples are 124 elderly which the inclusion criteria were ≥ 60-years-old elderly, suffering chronic diseases more than six months, willing to participate in the

study, and the ability to speak Indonesian and not a person living with Alzheimer's. Meanwhile, the samples of this study's exclusion criteria were not elderly in the research area, elderly with health mental, and elderly who refused to be the respondents. The data were collected by employing a purposive sampling technique. With the assistance of health cadres, the researchers collected the data by selecting elderlies with chronic diseases registered in the Posyandu attendance list in Posyandu (Integrated Healthcare Center) or Puskesmas (Public health centre). The researchers contacted and confirmed the participants to investigate if they were included in the study's criteria and then determined if they could be the research respondents. Meanwhile, to prevent any direct contacts and implement health protocol, the data was collected using google forms and phone interviews. When the number of data was adequate, the data collection was stopped.

This study employed four questionnaire items to collect demographic data consisting of age, address, education, occupation, and gender. Meanwhile, the questionnaire to collect health literacy data was HLS-EU-SQ10-IDN, a short version of the HLS-EU-47Q questionnaire that consists of 10 multiple-choice questions from 47 questions. The questions were selected by employing data mining techniques in the form of feature selection. The feature selection methods with genetic algorithm were used as validation (cross-validation) and classification (k-NN:k-nearest neighbor). The existing short-form models' accuracy was 90.64% with the HLS-EU-SQ16 and 88.67% with the HLS-SF12. The ten questions' results were expected to measure health literacy levels with fewer and more relevant multiple-choice questions for the Indonesian context (7). The questionnaire was distributed via a google form. The data analysis was computerized by employing computer program.

RESULTS DAN DISCUSSION

The results of the demography characteristics of respondents with chronic diseases in Makassar are presented in Table 1. They show that the respondents' mean age is 1.25,

Table 1. The Characteristics of Elderly Respondents with Chronic Diseases during
COVID-19 Pandemic in Makassar (n=124)

Characteristic	Mean	SD	N	%
Age	1.25	0.520		
60-70 years old			98	79
71-80 years old			21	16.9
81-90 years old			5	4
Gender	1.66	0.475		
Male			42	33.9
Female			82	66.1
Marital Status	2.36	0.546		
Unmarried			4	3.2
Married			71	57.3
Widower/Widow			49	39.5
Level of Education	1.19	1.180		
No-education			40	32.3
Elementary School			50	40.3
Junior High School			9	7.3
Senior High School			21	16.9
Bachelor			3	2.4
Master			1	0.8
Watching TV Shows for Health	3.02	1.37		
Never			6	4.8
Rarely			31	25
Sometimes			41	33.1
Frequently			46	37.1
Attaining Health Information from the Internet	1.37	0.781		
Never			98	79
Rarely			9	7.3
Sometimes			14	11.3
Frequently			3	2.4
Chronic Diseases Suffered within the Last Three Months	2.15	1.267		
Hypertension			46	37.1
Gout/hyperuricemia/arthritis			44	35.5
Diabetes Mellitus			14	11.3
Hypercholesterolemia/hyperlipidemia			15	12.1
Asthma			5	4

and the standard deviation value is 0.520. Meanwhile, the ranges of the respondents' age are 60-70 years old for 98 respondents (79%), 71-80 years old for 21 respondents (16.9%), and 81-90 years old for five respondents (4%). Meanwhile, the data on gender reveals the mean score is 1.66, and the deviation standard is 0.475. The total number of male respondents is 42 males (33.9 %), while female respondents are 82 females (66.1 %). Meanwhile, the respondents' marital status shows that the means score is

2.36 and the standard deviation is 0.546. The data consist of 4 unmarried respondents (3.2 %), 71 married respondents (57.3 %), and 49 widows/widowers (39.5 %). Meanwhile, the education data reveals that the means score is 1.19 and the standard deviation is 1.180. The data consist of 40 respondents with no school education (32.3%), 50 respondents with elementary education (40.3%), nine respondents with junior high school education (7.3%), 21 respondents with senior high school (16.9%), three respondents with

Table 2. The Description of Health Literacy Levels of Elderly with Chronic Diseases during the COVID-19 Pandemic in Makassar (n=124)

Criteria	Mean	SD	N	%
Levels of Health Literacy	1.84	0.714		
Insufficient			42	33.9
Problematic			61	49.2
Sufficient			20	16.1
Perfect			1	0.8

a bachelor degree (2.4%), and one respondent with a master degree (0.8%). Meanwhile, the habit of watching health programs on TV shows that the means score is 3.02 and the standard deviation is 1.37. The data consist of several criteria: 98 participants with never (79%), 9 participants with rarely (7.3%), 14 participants with sometimes (11.3%), and 3 participants with frequently (2.4%). The data about the elderly's access to the health information on the internet shows that the mean score is 1.37 and the standard deviation is 0.78. The data consist of 98 participants with never (79%), 9 participants with rarely (7.3%), 14 participants with sometimes (11.3%), and 3 participants with frequently (2.4%). Meanwhile, the data of participants' chronic diseases show 46 participants with hypertension (37.1%), 44 participants with gout/hyperuricemia/arthritis (33.5%), 14 participants with diabetes mellitus (11.3%), 15 participants with hypercholesterolemia/hyperlipidemia (12.1%), and 5 participants with asthma (4%).

The description of the health literacy levels of the elderly with chronic diseases during the COVID-19 pandemic in Makassar is presented in table 2. The results show that the mean of health literacy levels of the elderly is 1.84, and the standard deviation value is 0.714. Meanwhile, the data of health literacy levels show various criteria of health literacy levels: 42 participants with insufficient criteria (33.9%), 61 participants with problematic criteria (49.2%), 20 participants with sufficient criteria (16.1%), and 1 participant with perfect criteria (0.8%).

The Respondents' Demographic Characteristics

This study's results reveal that the most attractive demographic characteristic to investigate further is the elderly's education with chronic diseases. The data show that the significant education levels of the elderly with chronic illnesses are no education or elementary school (72.6% of the total respondents). Meanwhile, other levels of education indicate a low percentage: junior high school (7.3%), senior high school (16.9%), bachelor's degree (2.4%), and master's degree (0.8%).

This study agrees with previous studies' results that most of the elderly in Yogyakarta have no education level and graduate from elementary school (8). Furthermore, a similar result reveals that 20% of the elderly in the United States are illiterate (9). The elderly's cognitive functions consisting of health knowledge and abilities of the memory, speed of processing information, problem-solving, reading, and writing are closely related to the elderly's health literacy levels (10).

This study finds the existence of high-educational gaps among the elderly with chronic diseases in Makassar. This result agrees with previous studies conducted in a developed country, such as the United States. This finding shows that most of the elderly's low educational level becomes a challenge to improve health literacy, particularly in Indonesia. The educational approach and development for the elderly with chronic diseases necessarily consider the elderly's academic levels, and thus, the comprehension of their illnesses can improve. Meanwhile, the finding of the elderly's access to the health information on their chronic condition reveals that most of the elderly have never

watched a health program on TV (79%). Moreover, this study's finding indicates that the elderly have never searched or attained health information on the internet (79%).This study's results agree with previous studies, The elderly with a low level of health literacy requires assistance to fill in the forms, less read a newspaper, and less access to printed or electronic information (11).

The majority of the elderly with chronic diseases in Makassar never access and attain health information on TV and the Internet. It possibly occurs because most of them do not have smartphones that enable them to access the internet to search for information. Furthermore, TV shows for health are rare, and they are usually broadcasted in not prime time when not many people watch the TV. This condition becomes obstacles for the elderly during the COVID-19 pandemic to attain health information because offline health services are limited. This condition and obstruction will lead to any potential for the elderly's inadequate health information, mainly information on care and treatment for the elderly with chronic diseases. Health education media accessible to the elderly is necessary to provide information on their conditions or information on COVID-19 and its prevention.

The Description of Health Literacy Levels of Elderly with Chronic Diseases

This study reveals that the health literacy levels of the elderly with chronic diseases during the COVID-19 pandemic in Makassar vary in categories. The majority of the respondents (33.9%) show an insufficient health literacy level, while 49.2% of the respondents show a problematic health literacy level. These findings indicate that 83.1% of the elderly with chronic diseases in Makassar have a low health literacy level. Meanwhile, 16.1% of the respondents show a sufficient health literacy level, and 0.8% of the respondents indicate a perfect level of health literacy. This study's findings agree with those of the previous research proposing that most elderly with pre-hypertension (61.9%) in Bone Regency, Sulawesi Selatan, have a low level of health literacy (12). Low literacy levels strongly relate to low patient satisfaction, insufficient disease prevention services, and high use and cost of health services (13).

Moreover, health literacy strongly relates to the elderly's MCI (Mild Cognitive Impairment) (14). The elderly's health literacy has a significant role in encouraging their participation in campaigning against heart failure disease in Korea (15). A prolonged treatment period will then stimulate grief among the elderly with chronic diseases that potentially make them more stressed and depress (16). Furthermore, the elderly who forget the treatment regimen closely relates to their insufficient levels of health literacy.

Meanwhile, the elderly's fair medication process strongly relates to sufficient health literacy levels (17). The data indicate that 80% of the elderly with chronic diseases in the United States require assistance to attain health services and systems (18). Meanwhile, the elderly with hypertension, high cholesterol, and diabetes have twice as low the possibilities of achieving health literacy (19).

Many factors affected the health literacy level of the elderly. The research shows that the factors associated with the health literacy of the elderly in Vietnam were occupation, age, and various activities such as looking after children, social activity, doing exercises, watching TV, and using the internet and social activity (20). Based on a study in Korea, age, basic literacy, health status, gender and number of suffering chronic diseases were various factors of health literacy on elderly individuals (21). Various factors include age, marital conditions, education level, gender, race, household income, and former occupation associated with health literacy of the elderly (22). Also, observing and taking care of children and grandchildren was one of the activities of elderly with chronic diseases. It is one factors that can trigger and stimulate the elderly health literacy (23).

This study finds that the literacy level of the elderly with chronic diseases in Makassar is categorized low as their educational levels are low. This finding indicates that the elderly

with chronic conditions require health information and education. Furthermore, several study findings suggest that a low level of health literacy closely relates to the elderly's chronic diseases, insufficient health prevention services, medication and treatment process of the elderly, severe health condition, and death risks. One of the findings of this study proposes that the intervention to improve health literacy levels must prioritize elderly with chronic diseases, male elderly, elderly with a low level of education, and elderly with a severe chronic illness (13). This study's findings reveal that the elderly's low literacy level demands further educational handling and health promotion. Furthermore, during the current condition of COVID-19, the elderly with chronic diseases vulnerably contracted COVID-19. Thus, comprehensive prevention and handling, particularly the improvement of health literacy for the elderly, is significantly required.

LIMITATIONS

This study has several limitations. First, due to the COVID-19 pandemic, the respondents' data were collected through online tools, and thus, it requires a longer time. Second, most of the elderly are unable to operate smartphones and do not have one. Consequently, they required their family's assistance to fill in the google form, or the researchers switched the method by directly calling the respondents.

RESEARCH ETHICS

This study received the consent of research ethics from the ethics and health development commission of Sekolah Tinggi Ilmu Kesehatan Sint Carolus (STIK SC) number: 094/KEPPKSTIKSC/VIII/2020.
Furthermore, this research is considered ethically appropriate according to seven 2011 WHO standards, they are 1) social values, 2) scientific values, 3) distribution of expenses and benefits, 4) risk and benefits potentials, 5) exploitation, 6) confidentiality, and privacy, and 7) consent after the explanation. The standards refer to the 2016 CIOMS guideline and are indicated by the fulfilment of each standard.

CONFLICTS OF INTEREST

This study does not have any conflicts of interest.

GRATITUDES

CONCLUSION

During the COVID-19, the elderly with chronic diseases in Makassar dominantly have a low education level: no education level or elementary level. Meanwhile, access to health information reveals that the elderly with chronic diseases never watch TV shows for health or access the internet for information. The condition leads to the low health literacy level of the elderly with chronic diseases in Makassar, and the criteria of this condition are insufficient and problematic. It is expected that the results of this study can be fundamental data to develop health education and promotion for the elderly with chronic diseases in Makassar. Further investigation on the health literacy of the elderly with a chronic condition and the correlation between chronic diseases with health education services on primer health services is necessarily conducted.

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