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Potential Of Psychoeducation Media Based On The Internet Of Things For The Optimization Of Hypertension Management In The Elderly

Dewi Fitriani[1], Lukman Handoyo[2]*, Heri Setiawan[3], Fery Ferman Syah[4]
Program Studi Ilmu Keperawatan, Sekolah Tinggi Ilmu Kesehatan Widya Dharma Husada Tangerang, Tangerang Selatan, Banten, Indonesia[1,2,3,4]

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ABSTRACT

Elderly people with hypertension are a group that often do not comply with disease management. Psychosocial problems are one of the variables that contribute greatly to this non-compliance. In the current era of technological development, psychoeducation using Internet of Things-based media can be one of the interventions provided for the elderly. However, the use of this media has never been applied with the principle of being sensitive to changes in the elderly's sensing system, so it is necessary to explore the perceptions and experiences of health service providers for hypertensive elderly in the community. The aim of this research is to explore the perceptions of elderly health service providers in community settings regarding the implementation of education for hypertensive elderly. This research is a qualitative descriptive study involving five participants. Participants came from elements of the NCD Program, the Elderly Program and Community Health Nursing Program Coordinator at the Community Health Center as well as Community Health Workers. Data collection was carried out using the Focus Group Discussion technique and the results were analyzed thematically. The research results showed three themes: 1) Interventions Not Yet Diverse; 2) Limitations of Educational Media; 3) Technology Considerations in Elderly Education/Psychoeducation. Primary health services that create and apply Internet of Things-based psychoeducational media need to pay detailed attention to the principles and content so that they are easy to read and understand by the elderly.

Email :
lukmanhandoyo@wdh.ac.id

1. INTRODUCTION

The elderly population with hypertension is one of the populations at risk of neglecting disease management [1]. The neglect of hypertension management in the elderly is influenced by various factors, such as a lack of social support, insufficient knowledge and skills in disease management, and a decline in bodily functions, making it difficult for the elderly to adhere to recommended therapy [2] [3] [4] [5]. Poor hypertension management in the elderly ultimately leads to continuous high blood pressure, causing recurrent symptomatic complaints [2] [6] [7]. Ultimately, this may impact the decline in the quality of life for the elderly.

Optimal healthcare services in the community setting need to be implemented for elderly individuals with hypertension to better manage their condition. Services for clients with hypertension must be carried out in accordance with the Minimal Service Standards (SPM) set by the Republic of Indonesia Ministry of Health. The hypertension SPM includes routine blood pressure measurements, providing education on lifestyle changes and medication adherence, and making referrals as needed [8]

Of these three standards, education is a service that is still rarely developed by healthcare professionals, especially nurses. Education is often provided conventionally, with no difference in educational media compared to other age groups. However, the needs of the elderly are significantly

different [9]. The elderly may experience sensory-perceptual changes that make it difficult for them to receive information if the methods and media used are not suitable.

Education provided to the elderly should also consider psychological aspects, making psychoeducation strategies suitable [10]. Psychoeducation is an education that not only teaches the process and management of the disease but also addresses the psychosocial aspects experienced by clients during their struggle with the disease [11]. For example, a nurse provides education about a low-sodium diet for the elderly, but the nurse must also explore the obstacles and challenges faced by the elderly in complying with the diet. The nurse may discover that the elderly person is non-compliant because they feel neglected by their family members or are experiencing a decrease in motivation. These aspects are then addressed by the nurse for intervention.

The implementation of psychoeducation requires adequate media, such as those based on the Internet of Things (IoT). A study [12] demonstrates that education for the elderly is more effective when integrating IoT aspects into the education process. Through technology, visualization, and educational messages can be vividly portrayed, easily remembered, and can guide the elderly towards healthier behavior [12]. A study by [13] shows that psychoeducation can improve medication adherence in elderly individuals with hypertension. However, Sepulveda et al.'s study did not use IoT as the basis for media. Psychoeducation was still conducted conventionally. Subsequently [14] reports on the qualitative evaluation of the implementation of group-based IoT psychoeducation on the elderly, which turned out to provide emotional satisfaction. Harned's study utilized existing mobile apps to support the psychosocial well-being of the elderly, such as relaxation guide apps and anxiety-reducing audio applications. However, the target of the study was not specific to the elderly with hypertension, so it cannot be seen that IoT-based psychoeducation has an impact on disease management.

The need for IoT-based psychoeducation media for the elderly needs to be explored further among healthcare providers in the community setting. This is important to do because there has been an increase in the number of elderly individuals with hypertension at the national level [15] [16]. The consequences of the high number of elderly individuals with hypertension must be accompanied by the availability of adequate and accessible healthcare services. This includes the implementation of education media that are sensitive to the conditions of the elderly. The aim of this research is to explore the perceptions of community healthcare providers regarding the implementation of education for elderly individuals with hypertension.

2. METHOD

The design of this research is a qualitative study with a descriptive design. The research was conducted in June 2023 in the Working Area of the Community Health Center (Puskesmas) Benda Baru, South Tangerang City, Banten. Participants in this study were selected using purposive sampling. The main criteria set for participants were individuals with roles as healthcare service providers for the elderly. There were 5 (five) individuals selected at the research location, namely: one Coordinator of the Non-Communicable Disease Program at Puskesmas Benda Baru, one Coordinator of the Elderly Program at Puskesmas Benda Baru, one Coordinator of the Public Health Nursing Service Program (Perkesmas) at Puskesmas Benda Baru, and two Health Cadres in the Benda Baru Working Area.

Instruments and Data Collection Methods

The research instrument in this study is the research team itself. The researchers collected data using the Focus Group Discussion (FGD) method. In conducting FGD, the researchers were guided by a list of questions containing information about the general health conditions of hypertensive elderly individuals in the working area, barriers and challenges in caring for hypertensive elderly individuals, education strategies and processes carried out so far, as well as barriers and challenges in providing education to the elderly. FGDs were conducted for 1 session lasting 60 minutes. Each participant had the opportunity to express their opinions and comment on the opinions of other participants. During the FGD process, the researchers recorded the discussion and took notes on important points that needed attention.

Data Analysis

The collected data were analyzed thematically using the Colaizzi method. After the FGD process was completed, the researchers transcribed the verbatim data from the recorded discussions. The verbatim data were then carefully and thoroughly analyzed, and the results were cross-checked by other members of the research team. The verbatim results were analyzed both textually and contextually, and if there were similar keywords, they were formulated into a single theme.

Data Validity

The verbatim data were rechecked with the participants by seeking clarification on whether what was said accurately represented their statements (participants were provided with verbatim texts). In addition, the researchers also conducted source triangulation by interviewing an expert in community, family, and gerontic nursing research from Airlangga University to obtain their perspective on the need for IoT-based psychoeducational media for hypertensive elderly individuals. The interview results were then compared with the analyzed data based on participant responses. If there were discrepancies in the data, the researchers needed to seek clarification from the participants.

Ethical Considerations

This research was conducted with full attention to ethical principles and guidelines. The researchers did not coerce participant participation, provided explanations before the study, including the purpose, benefits, and the right to withdraw, obtained signed informed consent from potential participants, and committed to maintaining the confidentiality of participants' identities.

3. RESULTS AND DISCUSSION

This research has been conducted involving five healthcare providers for the elderly with hypertension, as listed in Table 1.

Table 1. Research Participants

No	Unsur Partisipan	Jumlah
1	Koordinator Program PTM Puskesmas	1 orang
2	Koordinator Program Lansia Puskesmas	1 orang
3	Koordinator Program Perkesmas Puskesmas	1 orang
4	Kader Kesehatan di Lingkungan Wilayah Kerja Puskesmas	2 orang
	Total	5 orang

Based on the FGD results, three themes were formulated: 1) Undiversified Interventions; 2) Limitations of Educational Media; 3) Considerations of Technology in Elderly Education/Psychoeduc ation.

Undiversified Interventions

Participants stated that efforts have been made to monitor the health conditions of the elderly through home visits, Posbindu activities, and direct services at Puskesmas. However, participants admitted that interventions for the elderly are still undiversified. Interventions are limited to conventional education, blood pressure monitoring, and medication.

> *"...yes...what has been done for elderly hypertension is mostly just checking blood pressure when we go to the field or with cadres during Posbindu activities. Education and medication are sure to be done. But there hasn't been much done."*

Coordinator of the Public Health Nursing Service Program -

> *"We often inform the elderly, especially during check-ups at Puskesmas. Oh, sir, you shouldn't eat salty foods, like that. But, it's limited to educating them. If there are innovative education methods, it hasn't been done much."*

Coordinator of the Elderly Program -

Participants also mentioned the need for a formulated approach to help elderly individuals with hypertension manage their condition well (adherence to therapy). This statement indicates that there has been no consistently implemented intervention strategy.

> *"...the elderly are hard to instruct, Sir. It's a bit difficult to change their behavior to be obedient to taking medication. We should find a way to make the elderly obedient. Sometimes their families don't listen to them. It takes extra effort for the elderly."*
> Coordinator of the NCD Program -

Additionally, cadres acknowledged that non-compliance of the elderly with hypertension management can be influenced by psychological factors. This indicates that education alone is not enough; there needs to be psychoeducation applied to address the psychological problems of the elderly.

> *"Sometimes, if I observe, the elderly not only don't know what they shouldn't eat, but they also seem resigned and lazy. It seems like no one pays attention to them. There are a lot of thoughts, maybe there should be someone paying attention to them."*
> Health Cadre 1 –

Limitations of Educational Media

The educational media used by nurses for elderly individuals with hypertension still relies on one medium, namely, leaflets. This medium is also considered not very effective for presenting information to elderly individuals with hypertension.

> *"When in the service, if it's unclear, I give them a leaflet. There are causes of hypertension, foods to reduce, exercises to do, right? But, honestly, the elderly sometimes find it hard to read. The writing is small..."*
> Coordinator of the Public Health Nursing Service Program -

> *"It seems like there's information on the back of the health promotion officer. But usually, I use leaflets. The important thing is that I've already informed them. Even though I also think it's not effective."*
> Coordinator of the NCD Program -

Participants explained that elderly individuals often have difficulty reading leaflets due to low contrast coloring or small font size.

> *"I once gave a leaflet, and the elderly immediately seemed confused. Then, the paper was taken outside where it's brighter, and they read it there. Maybe the color or something wasn't clear enough."*
> Coordinator of the Public Health Nursing Service Program -

> *"Most cadres just measure using a digital blood pressure monitor. After measuring, sometimes we give advice if the blood pressure is high. Don't eat this or that. Sometimes I write it down. Sometimes, if there are leftovers from Puskesmas, I give it. But I find it difficult to read. There's a lot of writing, small writing."*
> Health Cadre 2 -

Considerations of Technology in Elderly Education/Psychoeducation

Participants are aware that the national health transformation program includes the utilization of health technology as one of its pillars. Participants do not deny that this could become important and should be realized.

"We did get socialization from the Health Office about health transformation. There is, if I'm not mistaken, something about technology. Ideally, if possible, it's good to use it for the elderly. Technology isn't just about laboratory blood tests, but it can also be a website, right?"
Coordinator of the NCD Program –

"Yes, actually, what we use for education should be redesigned. It's quite a homework if the elderly read it. If there's a mobile app, we can just show it. It's actually practical. But, when they take it home, there still has to be something for them to read."

Coordinator of the Elderly Program -

Another participant added that when there is an element of technology application in the implementation of education or psychoeducation, it needs to be reconsidered whether it is really suitable for the readiness of the elderly. Because the elderly are considered to be generally difficult to adapt to technology.

"...I even, Sir, showed some pictures on Google. The elderly seemed confused, like they looked like not familiar with technology. We can do counseling and education using the web or apps. But it really has to be something comfortable for the elderly to look at."
Coordinator of the Public Health Nursing Service Program -

Discussion

The results of this study highlight that real interventions at the community level for the elderly with hypertension are still not varied. Interventions for elderly hypertension are dominated by conventional education, medication, and blood pressure monitoring. Although these can be considered as fulfilling the Minimum Service Standards (SPM), they may not necessarily address the root problem. The issues with the elderly with hypertension are not only about their blood pressure but also about the struggle of the elderly to be compliant with disease management. Various factors can affect the elderly, leading them to face new problems that make them non-compliant. For example, if the family support is low, the elderly may experience stress, which leads to demotivation for therapy adherence. Even a study by [17] reinforces this by explaining that elderly individuals with hypertension tend to experience stress and depression due to multifactorial causes. This indicates the need for psychoeducational interventions for elderly hypertension. By providing psychoeducation, the elderly are taught how to recognize and regulate emotions [18], which can help address their psychosocial problems, thus improving disease management.

This research also reveals that in primary healthcare services (Puskesmas), the media used for education is still very limited and not sensitive to the needs of the elderly. The elderly are more often presented with leaflets as the primary medium. However, leaflets are designed as supplementary educational media intended for self-learning at home. The elderly need media that are more sensitive to their conditions because there have been changes in sensory perceptions that affect vision and hearing in the elderly [19]. Furthermore, a study clearly states that font size must be considered for the elderly to be comfortable and easily readable according to their conditions [20]. This fact suggests the need for educational media applied to elderly hypertension with friendly and sensitive principles to the changes in the elderly.

The need for the development of technology-based psychoeducational media, especially IoT, is also highlighted in this study. The development and utilization of technology, which is part of the national health priority program (health transformation), are considered essential, including for elderly hypertension. The application of technology, such as a website as a psychoeducational medium, may be implemented. However, the use of technology needs to be carefully and wisely prepared because many elderly individuals are still not proficient in operating technology [21][22]. Therefore, IoT-based psychoeducational media seems to have the potential to become the main medium that must

always be accompanied by healthcare professionals/nurses as facilitators. It is not a medium used independently by the elderly.

4. CONCLUSION

This study produces three main themes: Undiversified Interventions; Limitations of Educational Media; and Considerations of Technology in Elderly Education/Psychoeducation. Interventions that do not accommodate many problems of elderly hypertension in the community need to be further developed by primary healthcare services, especially interventions involving psychological problems of elderly hypertension such as psychoeducation. In its development, psychoeducation also needs to be applied using appropriate media that are friendly and sensitive to changes in the sensory perceptions of the elderly. IoT-based psychoeducational media that considers color, brightness, font size, font type, and large images that can be easily understood by the elderly seem to be a breakthrough that can be considered for development. If implemented, this media should be accompanied by healthcare professionals/nurses to avoid difficulty for the elderly in its operation. We express our gratitude to the Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia for providing a grant for the Basic Research Beginner (PDP) to the research team. In addition, we also extend our thanks to the Working Area of Puskesmas Benda Baru and STIKes Widya Dharma Husada Tangerang for facilitating many aspects and providing opportunities for researchers to conduct the study..

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