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ORIGINAL ARTICLE

Meta synthesis: Mobile health education to healthy lifestyle for visual impairment[☆]



Mesra Rahayu^{a,b,*}, Muhammad Syafar^c, Razak Thaha^d, Nurhaedar Jafar^d, Sudirman Natsir^c, Intan Sari Areni^e

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^a Post Graduate Students in The Doctoral of Public Health Faculty, Hasanuddin University, Makassar, Indonesia

^b Faculty of Pharmacy, Hospital Technology, and Information Technology, Megarezky University, Makassar, Indonesia

^c Health Nutrition Department, Public Health Faculty, Hasanuddin University, Makassar, Indonesia

^d Health Promotion Department, Public Health Faculty, Hasanuddin University, Makassar, Indonesia

^e Electro Engineering Department, Engineering Faculty, Hasanuddin University, Makassar, Indonesia

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KEYWORDS

Mobile health;
Healthy lifestyle;
Visual impairment

Abstract

Objective: This study aims to identify and explain scientific evidence on mobile health education to healthy lifestyle for visual impairment.

Methods: Literature search using Proquest, PubMed, and Scinapse through databases from various countries in the last 3 years (2017–2019). 207 articles are selected based on inclusion criteria: peer-reviewed articles (Scopus Q1 and Q2).

Results: The results of meta synthesis show that there is a need for prevention of health promotion, blind people need voice recognition applications (without touch) for accessibility, education requires media and community involvement, and healthy lifestyle literacy pays attention to specificity by using the same method when introducing children, especially Visual Impairment beginner.

Conclusions: Theoretical and methodological considerations for further research is creating breakthroughs by developing mobile applications using voice recognition of Visual Impairments so that they can live as healthy as people without Visual Impairment.

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⁸ Corresponding author.

E-mail addresses: rahayum19k@student.unhas.ac.id, pmc@agri.unhas.ac.id (M. Rahayu).

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Introduction

Visual impairment is a global concern due to the complex health issues, such as physical issues (visual impairment), mental issues (depression and mental block), social issues (orientation, mobility daily, and discrimination), and independence which make people with visual impairment are considered unproductive even for maintaining a healthy lifestyle. The highest health problems suffered by visual impairment are personal hygiene 22.3%, less consumption of vegetables and fruit 16.10%, and lack of physical activity 13.56%.¹

There are 2.2 billion people who experience visual impairment worldwide. The visually impaired are divided into 2 large groups, category Total Blind and category low vision. Based on these data 1.1 billion is a total blind and 1 billion of them experience low vision. Visual impairment in Indonesia, occupies the second position in the world.²

Research shows, the importance of blind people accessing information. The information most needed by visual impairment is information that supports their healthy lifestyle.³ *Smartphone* based android has become the primary need of the millennial generation in the Industrial 4.0 era.⁴ Technology-based applications for the visually impaired such as the application let's read to read audio books, the TapTapSee application to identify nominal money, and the Talking Notification Application to tell the name of the caller. Whereas the health application is only a Whatsapp group for disease monitoring or taking medication. There is no specific application of information and health education for the blind.⁵

Methods

This literature review was obtained through an international search journal. Literature search using Proquest, PubMed and Scinapse. Searching for journals through basic data from various countries in the last 3 years (2017–2019). Articles are selected based on inclusion criteria: peer-reviewed articles (Scopus Q1 and Q2). Searching the database used the English keyword "Android based application, Healthy Lifestyle, and Mobile Health For Visual Impairment".

The literature review refers to the guidelines for Preferred Reporting Items for Systematic Reviews (PRISMA) (Fig. 1). Search results only focus on articles that are relevant to the research topic. The author analyzes through the domain to categorize the data obtained (Figs. 2–5). The Qualitative analysis in the review literature is called meta-synthesis (Table 1).

Results

Mobile health application

Mobile application technology eases people with disabilities to live like people see. Hence, it is necessary to design applications accessible to facilitate disability. PEN (Phone + Embedded board + Neural compute stick) is an application to detect images, sound, and process information for the visually impaired. Therefore, a needs analysis

is necessary before developing an application for the visually impaired. Primary healthcare medical practices have invested substantial information technology; the Electronic Medical Record (EMR) System effectively improves innovation and clinical performance in hospitals.^{5–8}

Mobile application for visual impairment

The literature review results that the most appropriate mobile application for the visually impaired is applications that implementing voice recognition, for instance, effective voice recognition for health education and voice recognition to facilitate doctors in recording clinical procedures.⁹

Health education

Good education and economy will have an impact on good health too. Conversely good health can increase education/school productivity and the economy. Blind people need partners or peers, both blind and looking to support their development. Video feedback successfully educates parents to be closer positively to their children so that children are independent.¹⁰

Healthy lifestyle

Personal hygiene

Personal hygiene and environmental hygiene must be taught from elementary school age to become a habit until adulthood. For example, the intervention to get children to wash their hands with soap for five consecutive months will become a habit.¹¹

Physical activity

The visually impaired physical activity is much lower compared to the people with normal vision in terms of duration. Visually impaired people do not do physical activities since they think the environment is not safe for them and do not understand the benefits of physical activity. The lower the visibility, the lower the physical activity undertaken by the visually impaired, and they tend to be more settled in one place without physical activity.¹²

Consumption of vegetables and fruit

Nutrition learning must be encouraged from childhood. Simultaneous nutrition intervention is necessary for children's health. Nutrition learning needs to be in the school curriculum. For example, vegetable and fruit gardening education while explaining its benefits to teaching the gardening process is a fundamental thing that should be taught at school.¹³

Discussion

Mobile health application is necessary for the millennial generation in the Industrial 4.0 era. Mobile application users are

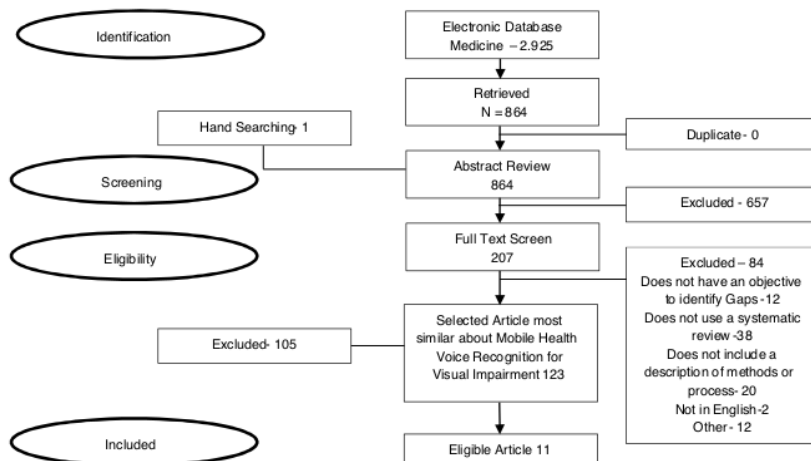


Figure 1 Systematic stages of review.

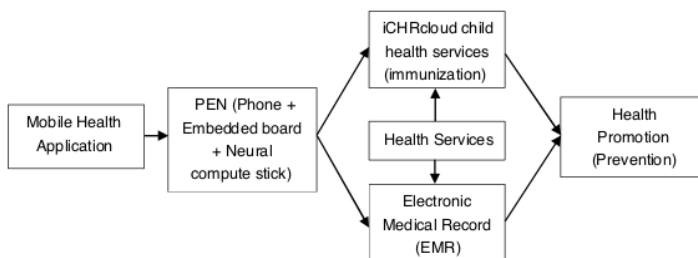


Figure 2 Domain mobile health application.

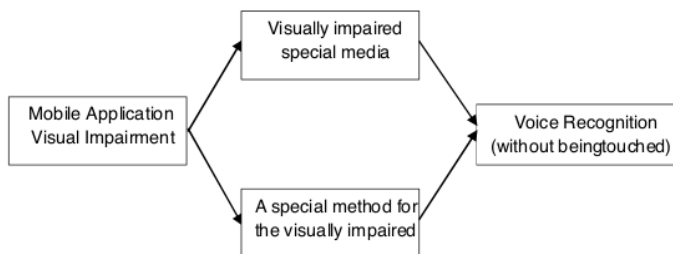


Figure 3 Domain mobile application for visual impairment.

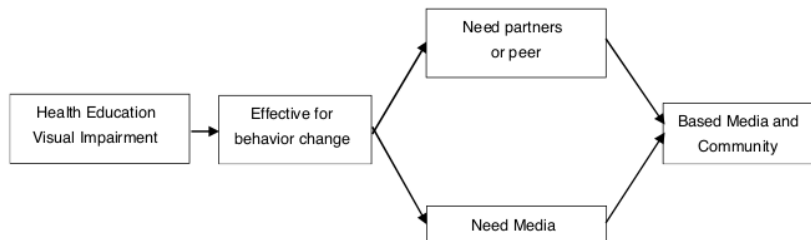


Figure 4 Domain health education.

Table 1 Research synthesis table (journal of scopus) on "mobile health education of healthy lifestyle for visual impairment" in the last 3 years.

No	Author	Title	Quality	Name	Year	Subject	Characteristics		Finding
							Instrument	Method / design	
<i>Mobile health for visual impairment</i>									
1.	Singh, H., Mallalah, R., Yadav, G., Verma, N., Sawhney, A., &Brahmachari, S. K.	5 iCHRcloud: Web & Mobile based Child Health Imprints for Smart Healthcare	Q2	Journal of Medical Systems	2017	16,490 child health records of 256 bit HTTPS	Website and CelulerCH cloud	Detailed analysis	iCHRcloud child health services (immunization information)
2.	Raymond, L., Pare, G., &Maillet, É.	15 IT-based clinical knowledge management in primary health care: A conceptual framework.	Q2	Knowledge and Process Management	2017	Health workers	Interview Guidelines and Electronic Medical Record (EMR)	Kualitatif	Electronic Medical Record (EMR) Information Technology System that effectively improves innovation in clinical performance in hospitals
2	Elmannai, W., &Eleithy, K.	Sensor-Based Assistive Devices for Visually-Impaired People: Current Status, Challenges, and Future Directions.	Q1	Sensor-Based Assistive Devices for Visually-Impaired	2017	Article collection	Synthesis table	Literature survey/meta analysis	The literature review results are the most appropriate application for the visually impaired using voice recognition
4.	16 Wu FM., Shortell SM, Rundall TG, Bloom JR.	10 A fog computing model for implementing motion guide to visually impaired.	Q1	Sensor-Based Assistive Devices for Visually-Impaired	2019	Visual impairment	6 Phone, Embedded Board, Neural Compute Stick (PEN) test system guide	Eksperiment	6 PEN (Phone + Embedded board +Neural compute stick) is an application to detect images, sound, and process information for the visually impaired.
<i>Mobile applications for visual impairment</i>									
5.	Aguiar de Lima, T., & da Costa-Abreu, M.	A Survey on Automatic Speech Recognition Systems for Portuguese Language and its Variations	Q1	Elsevier	2019	Portuguese based language	101 Papers from 2012 to 2018	Survei	Voice recognition is effective for health education

Table 1 (Continued)

No	Author	Title	Quality	Name	Year	Characteristics		Finding	
						Subject	Instrument		Method/design
6.	Health Education Matei, R., Broad, S., Goldbart, J., & Ginsborg, J.	Health education for musicians. <i>Frontiers in Psychology</i> , 9(JUL).	Q1	<i>Medical Sciences</i>	2017	4777 participants and 2244 pig owners in three villages	Interview guidelines	Interview	Education using the media both videos, comics, etc. is more effective than education without the media or education using the lecture method
7.	Healthy lifestyle Persons Chard, A. N., & Freeman, M. C.	Design, intervention fidelity, and behavioral outcomes of a school-based water, sanitation, and hygiene cluster-randomized trial in Laos	Q2	<i>International Journal of Environmental Research and Public Health</i>	2018	Laotian Primary Schools	Literature	Intervensi Wins	Personal hygiene and environmental hygiene must be taught from elementary school age to become a habit until adulthood
8.	Physical activity Smith, L., Jackson, S. E., Pardhan, S., López-Sánchez, G. F., Hu, L., Cao, C., ... Yang, L	Visual impairment and objectively measured physical activity and sedentary behavior in US adolescents and adults: a cross-sectional study	Q2	<i>Disability and Health Journal</i>	2019	1536 15-year-olds in the United States	National Children's Health Survey 2011e2012 (NSCH)	Cross-sectional	Visual Impairment people lack physical activity because they think the environment is not safe for them and they don't understand the benefits of physical activity
9.	Fruit and vegetable consumption Savoie-Roskos, M. R., Wengreen, H., & Durward, C.	Increasing Fruit and Vegetable Intake among Children and Youth through Gardening-Based Interventions: A Systematic Review.	Q2	<i>Journal of the Academy of Nutrition and Dietetics</i>	2017	891 articles	Synthesis table	Literatur Riview	Vegetable and fruit gardening education while explaining the benefits of teaching to the processing stage is the most basic thing that should be taught at school

Source: Review literature.

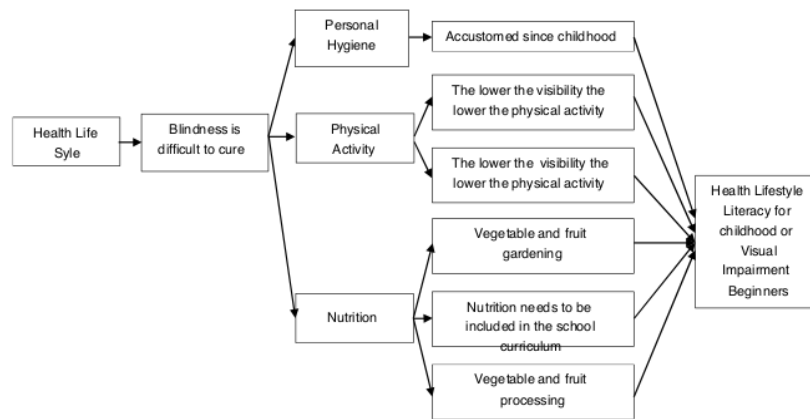


Figure 5 Domain healthy lifestyle.

not only people who have normal vision (normal) but also people with visual impairments (visually impaired).¹⁴ Technological advances are vastly developing, forcing visually impaired people must adapt quickly.⁵ Most healthy lifestyle are covered in smartphones so that the health sector will significantly benefit in facilitating and accelerating the dissemination of information.⁵

The results of literature review related to mobile health: (1) mobile application models for appropriate learning media on the competence of operating an electronic control system include preparation, subject of the operation of an electronic control system, and the evaluation model of pre-posttest exercises to assess the understanding of the material presented using the application; (2) testing the functionality of a mobile application for appropriate learning media on the competence of operating an electronic control system including ease of navigation, application performance, and operational ease; (3) the feasibility of a mobile application. Application for appropriate learning media on the capability of operating an electronic control system.¹⁵

Applications that are accessible and easy to use are essential. Therefore, a needs analysis before developing an application for the visually impaired is necessary. Many mobile applications are accessible and effectively solve the problem of Visual Impairment. Mobile health applications accessible for the Visual Impairment are still rarely found and primarily focused on the preventive shutter; most of the research focuses on therapeutic use in health service management. Counseling applications and family support are effective solutions for psychological problems, Image Modification application is an effective sound for object orientation, effective navigation system for mobility, etc.¹⁶

The literature review results that the most appropriate application for the visually impaired is applications that implement voice recognition. Based on the research collection, Voice Recognition is necessary for people who have physical disabilities who are unable to do data entry through the keyboard or mouse or have an inability to see what they input. Hence, mobile-based applications using voice recognition are highly suitable for visually impaired.¹⁷

Personal hygiene, physical activity, and consumption of vegetables and fruits must be taught from the early stages, at least from the elementary school stage, to become a habit until adulthood. Behavioral intervention for five consecutive months will become a habit.¹⁸

Conclusion

This article can be concluded as follows:

1. There is still a lack of health applications for health education in the context of health promotion.
2. Voice recognition application is very accessible for the visually impaired. Need to think about the design without touching the mobile phone.
3. Health education will be successful for the visually impaired if it uses media and involves social community groups in their environment
4. Health lifestyle literacy is very much needed for the Visual Impairment.

Conflict of interest

The authors have no conflict of interest to declare.

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