Digital Health Intervention of Healthy Indonesia Program with Family Approach: Does it Work?

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ABSTRACT

Background: The digital age holds out the promise of innovative technology. Along with the development of technology, healthcare management has been changing. Indonesia was implementing The Healthy Indonesia Program with a Family Approach (PISPK) that aimed at increasing access of families and their members to comprehensive health services, promotive, preventive, curative, and basic rehabilitative. Every household data related to 12 health indicators was digitally recorded and analyzed on a specific website to provide a database for determining suitable health and empowerment programs according to health problems experienced by the community. **Objectives:** This study aimed to assess the performance of The Healthy Indonesia Program with a Family Approach website in East Java Province, Indonesia. **Method:** The study design is cross-sectional with a descriptive exploratory study. Data was collected through an online survey utilizing Google Forms service and *analyzed descriptively with a thematic content approach. Result: Respondents of this research involving 232 health workers from community health centers in East Java Province that running Healthy Indonesia with a Family Approach. This research result found that the PIS-PK website met the criteria of a digital health monitoring tool recommended by WHO with the score of Functionality (70.54%), Stability (62.89%), Fidelity (58.17%), Quality (73.81%), Implementation (77.41%), and Judgement (67.92%). Conclusion: Healthy Indonesia with Family Approach Website was beneficiary to be used as the baseline in designing and developing a community empowerment program targeting specific indicators at the community health center level. However, several issues were noticed including, stability, fidelity, privacy, and data governance that should immediately take into account to improve the website's performance.*

Keyword: *Digital, Empowerment, Health, Innovative, Monitoring.*

INTRODUCTION

In the recent century, digital health intervention could connect healthcare systems and deliver health services to promote health outcomes for people in easy manner (Wootton and Bonnardot, 2015) The digital age holds out the promise of innovative technology and business models. Along with the development of technology and the competition in the business environment managing health care has been changing (Deloitte Indonesia, 2019). Digital health transformation is a critical agenda to encourage the realization of a Healthy Indonesia through the use of data and technology.

The Healthy Indonesia Program with a Family Approach (PISPK) is implemented by health centers by conducting family visits in their working areas (Indonesia Ministry of Health, 2016). This program aimed at increasing access of families and their members to comprehensive health services (promotive, preventive, curative, and basic rehabilitative). The implementation of PISPK is guided by Ministry of Health Decree No. 39 of 2016, carried out in stages starting in selected areas (9 provinces). In 2017, the target achievement was accelerated so that in 2019 all provinces, districts, or cities reached 9754 health centers.

After the family visit, the health workers then record the family health status based on 12 indicators including family planning, mother giving birth in a health facility, complete basic immunization, exclusive breast milk, growth monitoring for toddlers, hypertension, tuberculosis, severe mental disorders, the National Health Insurance participation, smoking, and access to clean water, and sanitary latrines to determine their health status namely Healthy Family

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(>0.8), Pre-Healthy Family (0.5 – 0.8), and Unhealthy Family (<0.5).

All of the recorded data should be input on The Healthy Indonesia Program with a Family Approach (PIS-PK) website. The use of the website helps monitor the family's health status and health problems faced by specific areas, families, and even individuals. As the health problem noticed by the health center, it will assist the health center and stakeholders to scheme adequate intervention to eliminate the problem. Health workers are also able to revise, add, and remove if there is an update from a family member such as newborns, deaths, and health status changes. The change in the indicators will also affect their health status. Prior studies reported the obstacles faced by health centers during the implementation of the PIS-PK (Novianti *et al.*, 2020; Trisna, 2021; Marta Nia, 2022) but limited information was available about the utility of the website of PIS-PK. This study aimed to assess the performance of The Healthy Indonesia Program with a Family Approach website in East Java Province, Indonesia.

METHODS

The study design is cross-sectional with a descriptive exploratory study. Data was collected through an online survey utilizing Google Forms service and analyzed descriptively with a thematic content approach. The total respondent involved in this study was 232 respondents from community health centers in East Java Province, Indonesia. The monitoring component was assessed following the guideline of WHO, namely functionality, stability, fidelity, and quality (WHO, 2016b). The researcher then included two more components implementation and judgment to assess the attitude and practice of the respondent related to the website. This study obtained ethical exemption from the Faculty of Public Health University of Jember No 283/KEPK/FKM-UNEJ/I/2023 on January 3rd, 2023.

RESULTS

Table 1. Respondent Characteristics

Characteristics of Respondent	**n**	**%**
Account Type		
Head of Health Center	11	4.74%
Admin of Health Center	149	64.22%
Supervisor	23	9.91%
Surveyor	49	21.12%
Age of Respondent		
21-30	71	30.60%
31-40	119	51.29%
41-50	34	14.66%
51-60	8	3.45%
Health Center Location		
Urban	47	20.26%
Rural	180	77.59%
Remote	5	2.16%
Data Collection Status		
Total Coverage	144	62.07%
Partial Coverage	88	37.93%
Education Level		
Diploma	102	43.97%
Bachelor	118	50.86%
Graduate	12	5.17%
Sex		

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Characteristics of Respondent	**n**	**%**
Male	54	23.28%
Female	178	76.72%
Profession in Health Center		
Medical Doctor	7	3.02%
Public Health	81	34.91%
Midwifery	49	21.12%
Nurse	89	38.36%
Other Health Profession	4	1.72%
Non-Health Profession	2	0.86%

According to the table 1, most of the respondents were the admin of the website in the community health center (64.22%) while the least was head of health center (4.74%). The majority of respondents were in the thirties age group (51.29%) and the least was in the fifties (3.45%). As for the location of the health center, the majority of respondents were serving in rural areas (77.59%) and the least was serving in remote areas (2.16%). The data collection status was mostly already total coverage or already survey all of the families in health center work areas (62.07%) and the rest still partially surveyed the family. Most of the respondents already hold a bachelor's degree (50.86%), followed by diplomas (43.97%), and graduate degrees (5.17%). The majority of the respondents originally work as nurses in health centers (38.34%), followed by public health practitioners (34.91%), and the least was from non-health-related professions (0.86%).

Table 2. Monitoring Components of Digital Health Intervention

Aspect of Monitoring	**Score**
Functionality	71.54
Stability	62.89
Fidelity	58.17
Quality	73.81
Implementation	77.61
Judgment	67.92

Figure 1. Monitoring Components of Digital Health Intervention

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The score of each monitoring component was categorized into four categories following the quartile, worst, bad, enough, and good. According to Table 1, the functionality score of the website is in the third quartile (71.54) categorized that the website has enough function. The stability score was 62.89, categorized as stable enough. The fidelity score of the website was the lowest compared to other components with only 58.17 but it was categorized as enough. The quality of the website was categorized as enough (73.81), Implementation was good (77.61), and the judgment of the website from all of the respondents was categorized as enough (67.92).

Functionality

Functionality means the ability of digital health to perform the intended intervention (WHO, 2016b). The functionality of the PIS-PK website was assessed to measure whether the website could provide the intended intervention design including the user convenience, provide the 12 indicators result, provide a health status map, and provide the target data for specific health problems.

User convenience is one of the main functions that should be taken into account to develop digital health (Matenga-Ikihele *et al.*, 2022). The convenience helps the user to optimize the utility of digital health tools. The PIS-PK website provides 12 indicators result that could project the family status in a specific area, it is really helpful for the health center to design and consider health efforts that should be enforced to solve the health problem faced by the community. Even so, some inconveniences were also stated by the respondents.

> *"… It is an inconvenience because it is a website, to open on the mobile a bit stressful due to the screen display being a bit difficult to read compared to the mobile application."*
>
> *"Health status map is perfectly displayed but the data used to create the map isn't the updated data."*
>
> *"The website needs menu improvement, it is difficult to track people with the same name and address."*
>
> *"The analysis function is great but it is complicated for me"*

Stability

The stability of digital health means the ability of digital health to perform consistently during use in normal conditions (WHO, 2016b). The research result reported that the stability score was 62.89 because the website was reported to have several problems. The data was not updated regularly and the website was reported facing several times errors or downtimes. Technical stability is one of the components that should be taking consideration to make sure that digital health tools are performed as intended especially in clinical effectiveness (Mathews *et al.*, 2019)

> *"The error almost occurred every month, it is such a wasting time"*
>
> *"I already entry some of family data but it got lost without notice and cannot be tracked"*
>
> *"Too much time spent for maintenance, I cannot open the website when I need to."*

Fidelity

The fidelity of digital health means the ability of digital health to deliver the intended goal (WHO, 2016b). High fidelity of digital health tools is critical to generate and providing effective evidence(Guo *et al.*, 2020). However, the fidelity score of the PIS-PK website was the lowest among the other monitoring component at 58.17. It was reported that the user faced several problems while using the website, from the data changing after entry, to sudden errors during entry data, and another application was needed to assist the analysis.

> *"I got really frustrated with the sudden error"*
>
> *"I need to use INARATA to analyze the updated data, the website was not updated regularly*
> *"I entry almost five hundred family data but one of the indicators is suddenly changing from*

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what I had an entry, such a wasting time for me"

Quality

Quality means the ability of digital health to meet or exceed user expectations (WHO, 2016b). Data quality has been the main issue in big data operationalization (Kruse *et al.*, 2016). Prior research reported that there was a gap in evaluating the quality of digital health software and the available research was not satisfactory enough to address the existing gap (Kokol *et al.*, 2022). This research only assessed the quality of the PIS-PK website based on the ability of the website to provide maps of the community based on health status, provide data related to family-facing health family and the data availability to be used as based data in designing community empowerment or health intervention program.

"The website provides base data for future program planning and design which is beneficial for us who worked in health centers"

"The available raw data was really beneficial but unfortunately it was not updated regularly which made us need to keep in contact with the Ministry of Health to update our data"

"The PIS-PK program was unuseful, wasting time, and the data was not matched with the other program. This program should be stopped."

Data provided by the PIS-PK website was initially to be used as the base data for designing community empowerment programs or health interventions to improve community health status (Indonesia Ministry of Health, 2016). The result of the research reported that the implementation score according to the website users was good by 77.61. The data available from the website was used to design future health interventions, the website was used to monitor the health status improvement of the community, and the health worker in the health center could easily decide the program target using raw data from the website. The judgment criteria were added to understand the attitude of website users related to the PIS-PK website. The score was reported as 67.92, the majority of the respondents agree that the website performance is satisfactory and beneficial however, the menu available on the website was not meeting their needs.

"The program is great but it would be better if an intervention menu was added to track the total family that has been receiving the intervention."

"The website would be really great if the data was updated regularly and not facing much maintenance and errors. As a health worker, I need to open the website anytime and anywhere but the encounter errors really not helping."

DISCUSSION

The Healthy Indonesia Program with Family approach was upheld with the implementation of three main pillars, healthy paradigm enforcement, strengthening health services, and implementation of national health services. It was implemented to improve the health services access of the community. The family was chosen as the focus of the Healthy Indonesia Program because the family has five functions, the affective function, socialization, reproduction, economics, and health care (Indonesia Ministry of Health, 2016).

The family was visited by a health worker then the health status was recorded on the PIS-PK website to know the family health status and map the health problem according to the 12 indicators faced by the family. The available of PIS-PK website aims as a database to map health problems and evaluate the health effort impact addressed to the specific family.

The website itself has several menus that are really complex from the recording data of the family after the visit,

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updating data of the family, intervention received by the family, to the data analysis that can produce graphs and figures. The available website was really beneficial to accelerating the public health degree in Indonesia if it was meeting the criteria of good digital health including functionality, stability, fidelity, and quality (WHO, 2016b). Several previous types of research have been done mostly highlighting the difficulties of the PIS-PK program implementation in the field such as insufficient human resources, infrastructures, financing (Afrianti and Pujiyanto, 2020), server capacity (Trisna, 2021), lack of socialization, and delays in reporting (Nia, 2021). Not much data is available addressing the utility or performance of the PIS-PK website.

An initial study done in Nepal reported that there were several challenges, opportunities, and benefits while implementing digital health. nize healthcare delivery and may improve the quality of health intervention (Guo *et al.*, 2020; Kuwabara, Su and Krauss, 2020; Butcher and Hussain, 2022; Kokol *et al.*, 2022)there are numerous challenges that hinder the rapid adoption of these technologies, including data quality and robustness, patient safety, ease of use, privacy concerns, and accessibility, and ethical challenges (Novillo-Ortiz *et al.*, 2018; Cummins and Schuller, 2020; Iyamu *et al.*, 2022; Parajuli *et al.*, 2022).

Privacy and data security have emerged as some of the most contentious issues in the conversation regarding digital health technologies (Sharma *et al.*, 2018; Cummins and Schuller, 2020). The usage of the PIS-PK website was really helping health centers to design an appropriate health intervention to address health problems faced by the community, however, the privacy issues have been growing since the family data contain sensitive information that the health worker could easily access and share, it is such a challenge to keep the information confidential. The lack of privacy protection could deliberate family fears of revealing private information about themselves (Fahey and Hino, 2020). That could lead to false information provided by the family members to prevent their information from being shared. It is necessary to develop family trust and confirm a commitment to take care of However, the most challenges were inadequate technical facility and shortage of skilled workforce (Parajuli et al., 2022). That was also faced by Indonesia during the implementation of PIS-PK. The sudden of errors indicating that the technical facility to run PIS-PK program was inadequate and the late update data also showing that there was shortage in skilled workforces. Study that has been done in America reported that 57.9% of the countries surveyed have a national eHealth policy or strategy, but among them only 26.3% have an entity that supervises the quality, safety and reliability regulations for mobile health applications (Novillo-Ortiz et al., 2018). The result of the study indicates that challenges in implementing digital health not only occurred in developing countries also in developed country as well.

Digital health technologies have significant potential to revolutio
their privacy. Another challenge that is faced by digital health is data governance (Manteghinejad and Javanmard, 2021). It is noticed that almost all government agencies shifting to digitalization, however, a lack of privacy policy to protect the data has been noticed(WHO, 2016a). It is critical to set up a data governance policy to enforce the safety of data governance in digital health.
Evaluation of digital health impact entails a multidimensional approach employing mixed methods study to analyze health worker perspectives, patients or subject perspectives, the health system, cost-benefit, and cost-effectiveness of service delivery (Greaves *et al.*, 2018). The cost-effectiveness and sustainability of digital health should be noticed by the related stakeholders.

CONCLUSION

The utility of PIS-PK website is really helpful to assist health center in designing and developing appropriate health intervention to improve community health status and already serving four components of good digital health. However, several shortages were noticed by the users that hinder the optimal performance of the website to reach its goal in providing accurate data to plan or improve community health program or health intervention that targeting specific health indicators. The shortages should be resolved in timely manner to accelerate

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the improvement of public health status in Indonesia. This study only highlighted the user perfective to monitor the performance of PIS-PK website. Further research still needed to assess other aspect of PIS-PK website in order to provide rounder evaluation of the PIS-PK impact improving community health status in Indonesia.

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