Swamedig Prototype: The Integrating Application for Interprofessional Practice of Pharmacists, Nurses, and Midwives

Setiyo Budi*, Prasojo Pribadi, Salsabila Salma Zahrah, Bagus Badrun Tamam, Ayung Damayanti, Khalinda Nur’aini, and Zaleha Rumadi

1 Department of Pharmacy, Faculty of Health Sciences, Universitas Muhammadiyah Magelang, Magelang, Indonesia
2 Center for Digital Pharmacy Studies (Diphars), Universitas Muhammadiyah Magelang, Magelang, Indonesia

Abstract. Related to the participating of midwives and nurses in the self-medication by community outside of pharmacist supervision, since the public is more able to expect improper medication. Instead of efforts to eliminate the involvement of both stakeholders, employing the information system that integrates interprofessional practice with pharmacists will be a suitable deal. After that we carried out a literature review by searching several national publications related to the development of online self-medication applications, flowcharts were compiled using web-based online diagramming software; draw.io. Microsoft Office Power Point version 2019 was used to create the user interface. The prototype outcomes were displayed in a scientific discussion board for pharmacy students, and members granted reviews and feedback. Here in, we show our “Swamedig” prototype, the integrating application for interprofessional practice of pharmacists, nurses, and midwives. Our prototype is an application integrating interprofessional practice of pharmacists, nurses, and midwives. The program connects them in collaboration of expertise to support the community taking self-medication. The core of our menu, pharmacists supervising drug selection and administration based on assessments performed by nurses and midwives. Thus, our project is developed to realize the rational drug use. In addition, our prototype was ready for the next stage on the engine to complete the software development process.

1 Introduction

Every individual has the freedom to choose and take medicines to cure their specific illness [1]. However, the inaccuracy of the self-medication process leads to many more issues, such as incorrect dosage, improper drug use durations, and the inability to reduce adverse effects [2]. According to the communities in which individuals self-medicate, pharmacists as medical specialists play a role in avoiding patients from irrational drug use [3].

© The Authors, published by EDP Sciences. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).
On the other hand, more medical professionals, such as nurses and midwives, commonly participate in the self-medication practice in the community [4], [5]. While treating sick infants and toddlers, health policy allows midwives the possibility to engage in self-medication [6]. Likewise, nurses are responsible for ensuring patient care in the community by practicing proper drug administration to treat patients [7].

Related to the participation of midwives and nurses in self-medication outside of pharmacist supervision, the public is more likely to expect improper medication. Instead of efforts to eliminate the involvement of both stakeholders, employing an information system that integrates interprofessional practice with pharmacists will be a suitable solution. Here, we present our "Swamedig" prototype, an integrating application for the interprofessional practice of pharmacists, nurses, and midwives.

2 Methods and materials

In this study, a literature review was carried out by searching several national articles related to the development of online self-medication applications. The search process was carried out using the Google Scholar search engine with the keywords “Self Medication” AND “application-based learning” the search for similar applications using the Google Play Store application on Android with the keywords "Pharmacy” AND “Self Medication”.

Flowcharts are compiled using web-based online diagramming software; draw.io. The Microsoft Office Power Point version 2019 was used to create the user interface. The prototype outcomes were displayed in a scientific discussion board for pharmacy students, and members granted reviews and feedback.

3 Results and Discussion

3.1 A literatur review prior to swamedig

The development of a self-medication application system has been developed in the form of an "Apotek Keluarga Online" (AKO). This application provides tutorials on rational self-medication practices for common community complaints such as fever, flu, cough, or skin diseases [8].

The “Online Prescription Diagnosis” application is released as an alternative to prescribing services and provides technology-based drug information. In an effort to avoid irregularities in drug use, this application has features that support the health care system, namely doctor consultations, prescription services, providing drug information, and drug interaction checkers [9].

“Siatap”, a digital medium for consultation regarding drugs currently being consumed by patients, aims to minimize the possibility of medication errors. This app is intended to be interaction channel between pharmacists and patients [10].

The “Mitra Apotek Digital” is a specialised application for pharmacy managers to explore the simplicity of operating their pharmacy business in the digital age. This application is designed exclusively for pharmacies. Sales, procurement, inventory, finance, users, consumers, doctors, and suppliers are all included [11].
3.2 The flowchart and user interface design of Swamedig

The main results of this study are the operational step of the Swamedig in the form of flowcharts that confirmed by the user interfaces design. The flowchart shows the workflow of the system in carrying out the consultation process carried out by the user and admin. In this application system, the user is a nurse and midwife who practice independently in the community, while the admin is a pharmacist in charge of the pharmacy (Fig. 1).

The main page includes the option to log in as an administrator or a user (Fig. 2a). A user login displays the page to input a username and password (Fig. 2b), thus the homepage, which includes four main menu options, such as: e-consultation, PIO, procurement, and history (Fig. 2c).

The e-consultation menu, includes a chat room where the user can consult with the admin directly. By clicking the plus button in the lower left corner, users can also add a patient examination result form (Fig. 2d). Display of system database from the patient examination results form that the user reports to the administrator (Fig. 3a).
Display the output data from the inspection result form that the user has already sent. The user may request the administrator immediately through this menu (Fig. 3b). Further, the user allowed to view number of medical informations (Fig. 3c), while the specific information of drug choice was displayed following the name of drug clicked. The user will find the informations among drug names, indications, interactions, contraindications, and warnings of side effect (Fig. 3d).

The procurement input display is used by the user to select the drug based on his requirements (Fig. 4a; Fig. 4b). The last menu, display of the inputed self-medication history of patients, which contains the names of patients who taking self-medication (Fig. 4c), and the user may check an example of displaying the history of self-medication results for specific patient.
According to the way for admin log in display, which the admin just input a username and password (Fig. 5a). When the admin click e-consultation menu, will provided a chat room in that can be used to provide consulting services directly to the user. Admins can receive and open patient examination results forms that the user has submitted (Fig. 5b). The admin can view the results of the self-medication that has been performed in this menu. Admins can also upload self-medication results by clicking the + button in the upper right corner of the page (Fig. 5c ; Fig. 5d).

On the PIO menu, the admin may submit drug information data for the the user (Fig. 6a), which he can preview the result on the display for specific drug (Fig. 6b). The last menu for admin is the procurement menu, that admin can view the results of drug orders by the user (Fig. 6c ; Fig. 6d).
3.3 Discussion

“Swamedig”, our prototype is the application integrating interprofessional practice of pharmacists, nurses, and midwives. The programme connects them in collaboration of expertise to support the community taking self-medication. The core of our menu, pharmacists supervising drug selection and administration based on assessments performed by nurses and midwives. By our prototype, the integrated health workers perform each responsibilities in accordance with the legal regulations to restrict malpractice incidents. Thus, our project is developed to realize the rational drug use.

Qualified health workers provides care services based on their field of expertise. [13]. The prototype designed is included in the e-Health Care Application through a health information system [14], which is an application supports the caring and covering of medical health services such as, electronic medical records, clinical decision support systems, telemedicine, telecare, personal health records and others [15]. Health professionals should use technology tools to manage health service networks through health information systems in an integrated way [14].

To the procurement menu. Nurses and midwives allow to carry out the process of ordering and purchasing drugs. The admin (pharmacy) providing is limited to the over-the-counter drugs and the primary available-medicines, with an appropriate maximum amount of purchasing. This restriction is intended to prevent the misuse of drugs that should only be used with a doctor's prescription [16].

In its application, the selection and administration of drugs will be monitored by pharmacists based on examinations carried out by nurses and midwives. The application help nurses and midwives to follow up on the results of the examination and provide appropriate treatment therapy for patients. In addition, this application can also facilitate pharmacists in carrying out their obligations and duties to carry out self-medication [17]. With the swamedig application, health workers can carry out their duties in accordance with their respective authorities, to avoid malpractice incidents. The main purpose of designing the swamedig application is to achieve rational treatment for patients. The use of drugs is referred to as rational if the patient receives the appropriate drug for clinical needs, with the appropriate dose administered in a timely manner, and at an affordable cost for both individuals and the community [9].

In this application, the user is a nurse or midwife who practices independently. While the admin is a pharmacist who works in a pharmacy. The concept of the information system to
be developed is designed simply with four main menus, including the e-consultation, PIO, procurement, and history menus. In the e-consultation menu, users can communicate directly via chat with the admin to perform self-medication [18], [19]. In this menu the user is also provided with a page to be able to upload patient’s examination result form. It is with this menu that the self-medication process is carried out. The admin will send the results of self-medication so that the user can follow up with the administration of drugs that have been recommended by the admin, who is a pharmacist. The results of this consultation will later be stored and archived in the history menu, so that the results of self-medication can still be accessed at any time [20]. This history menu can help admins and users to access self-medication results if needed to monitor the results of treatment given to patients. In this application, users are also provided with a PIO (Drug Information Center) menu which can be used to access drug information data, including drug names, indications, side effects, contraindications, dosages, instructions for use, and warnings [21]. This menu is expected to provide adequate drug information in order to increase patients’ safe, effective, and rational drug use. According to research conducted by Satrio et al, there was a significant difference in the group given drug information services and counseling compared to the group without drug information services and counseling [22].

Afterward, after the user accesses this procurement menu, the user can obtain the ordered drug, along with information and education on how to store it properly [23]–[25]. This is done to ensure the quality and safety of drugs ordered and stored by users. The difference between this study and similar application research that has been developed previously is that this self-medication application can only be used by nurses and midwives, not patients. Furthermore, based on the findings of the literature review, this study did not discover the development of self-medication applications that are specifically used to connect nurses and midwives with pharmacists. Therefore, this self-medication application is a new concept that can be developed to improve rational drug use for patients [26], [27].

4 Conclusions

"Swamedig", the prototype resulting from this research, is an application that integrates the interprofessional practices of pharmacists, nurses, and midwives. The programme connects them in collaboration of expertise to support the community taking self-medication. The core of our menu, pharmacists supervising drug selection and administration based on assessments performed by nurses and midwives. Thus, our project is developed to realize the rational drug use. In addition, our prototype was ready for the next stage on the engineering to complete the software development process.

References


Undang-Undang Republik Indonesia Nomor 36 Tahun 2009 Tentang Kesehatan. 2009.


