

การประเมินคุณภาพและความพอใจต่อแอปพลิเคชันบนมือถือ สำหรับการให้ข้อมูลยาที่มีใน
โรงพยาบาลส่งเสริมสุขภาพตำบลและโปรแกรมการเยี่ยมบ้าน
ในเขตการดูแลของโรงพยาบาลองค์กรักษ์ จังหวัดนครนายก
Development of Mobile Application for Medicinal Information
and Home-visiting Program in Sub-district Health-promoting Hospitals,
Ongkharak Hospital Network, Nakhonnayok

นิพนธ์ต้นฉบับ

Original Article

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บทคัดย่อ

วัตถุประสงค์: เพื่อประเมินความเห็นต่อคุณภาพและความพึงพอใจต่อแอปพลิเคชันสำหรับเป็นแหล่งข้อมูลด้านยาสำหรับบุคลากรทางการแพทย์ และโปรแกรมเยี่ยมบ้าน สำหรับบันทึกข้อมูลผู้ป่วยและปัญหาขณะเยี่ยมบ้าน **วิธีการศึกษา:** ดำเนินการศึกษาในโรงพยาบาลส่งเสริมสุขภาพตำบลในเขตการดูแลของโรงพยาบาลองค์กรักษ์ จังหวัดนครนายก แอปพลิเคชันที่สร้างขึ้นได้รับการประเมินโดยผู้เชี่ยวชาญด้านเทคโนโลยีการศึกษาและเภสัชกร โดยมีคะแนนเต็มด้านละ 5 คะแนน **ผลการศึกษา:** แอปพลิเคชันที่ออกแบบและพัฒนาขึ้นสามารถให้ข้อมูลด้านยาได้อย่างถูกต้อง โปรแกรมการเยี่ยมบ้านแสดงผลได้ตรงตามความต้องการ ผลการประเมินบ่งบอกคุณภาพระดับดี 3 ด้าน ได้แก่ ด้านโปรแกรม (4.08 คะแนน) ด้านความสวยงาม (4.33 คะแนน) ด้านเนื้อหาและองค์ความรู้ (4.14 คะแนน) และบ่งบอกคุณภาพระดับดีมาก 1 ด้าน ได้แก่ ด้านการนำไปใช้ (4.75 คะแนน) ผลการประเมินความพึงพอใจในการใช้แอปพลิเคชันโดยบุคลากรทางการแพทย์บ่งบอกความพึงพอใจมากที่สุด 2 ด้าน ได้แก่ ด้านโปรแกรม (4.67 คะแนน) และด้านการนำไปใช้ (4.75 คะแนน) ส่วนด้านความสวยงามบ่งบอกระดับความพึงพอใจมาก (4.50 คะแนน) **สรุป:** แอปพลิเคชันที่พัฒนาขึ้น สามารถให้ข้อมูลยาได้ถูกต้องและโปรแกรมการเยี่ยมบ้านแสดงผลได้ตรงตามความต้องการ หากพัฒนาต่อไปจะเป็นประโยชน์ต่อการปฏิบัติงานของบุคลากรทางการแพทย์ ทำให้ผู้ป่วยได้รับยาอย่างถูกต้อง ปลอดภัย และช่วยในการติดตามผู้ป่วยจากการเยี่ยมบ้านอย่างต่อเนื่อง

คำสำคัญ: แอปพลิเคชัน, โรงพยาบาลส่งเสริมสุขภาพตำบล, ยา, การเยี่ยมบ้าน

Editorial note

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Abstract

Objective: To determine opinion on quality of and satisfaction on the developed mobile application capable of providing information of medicines available and for recording patient data and medical problems in home-visiting program. **Method:** The research was conducted with sub-district health promoting hospitals under the Ongkharak hospital network, Nakhonnayok. Performance quality and satisfaction of the application was evaluated by experts and pharmacists with questions with a 5-point rating scale. **Results:** The developed application could provide accurate medicinal information and the home-visiting program met the requirements. Excellent quality of implementation was reported to be 4.75 points and good quality of functional software, performance interface and content were reported to be 4.08, 4.33 and 4.14 points, respectively. Additionally, excellent user satisfaction on functional software and implementation were reported to be 4.67, and 4.75, respectively, and good user satisfaction on performance interface was reported to be 4.50 points. **Conclusion:** The developed application is considered a reliable tool for health-care teams in providing correct and instant medicinal information. It is also useful in patient following up in home-visiting program.

Keywords: application, sub-district health-promoting hospitals, medicines, home-visiting program

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Introduction

Sub-district health-promoting hospitals are located in all sub-districts throughout Thailand to provide highly accessible medical services to patients requiring long-term care. Moreover, health-care teams are responsible to participate in home-visiting program in which medical services are provided to patients at their homes. However, limitation of health-care

teams, especially doctors and pharmacists, has been commonly known. This major problem has resulted in a variety of medication errors. It has been reported that medication dispensing process performed by non-pharmacists led to medication errors, such as wrong indication and drug interaction. Therefore, treatment effectiveness and patient

safety were at risk and work performance was considered low.^{1,2} Additionally, in home-visiting program, transfer of patient data and medical problems among multi-disciplinary teams is one of the key factors making holistic care successful.^{3,4} Thai COC is a web-based software used to record patient data and medical problems in home-visiting program. Nonetheless, regarding to accessibility, it has been suggested that mobile application would be more helpful than web-based software.⁵

Presently, several mobile applications have been developed to provide medicinal information, thereby helping decrease medication errors. However, most applications contain database in foreign languages, need download fee or are not developed for home-visiting program. Therefore, such applications are not fully beneficial to local health-care teams at sub-district health-promoting hospitals.^{6,7} The objective of this research was to determine opinion on quality of and satisfaction on the developed mobile application capable of providing information of medicines available in sub-district health-promoting hospitals, Ongkharak hospital network, Nakhonnayok, and recording patient data and medical problems in home-visiting program.

Methods

Data Collection

List of medicines available in 6 sub-district health-promoting hospitals, Ongkharak hospital network, Nakhonnayok, was made and related information, such as indication, regimen and administration, contraindication, precaution, drug interaction and side effect, was collected from Lexicomp, Micromedex and MIMs. Home-visiting problems were also acquired by interviewing members of health-care teams.

Application Development

Mobile application layout displaying interface details and presentation layers was designed and android-based application was constructed using Thunkable X, Airtable and Firebase.

Application Evaluation and Data Analysis

Developed application was evaluated using evaluation forms designed to evaluate application quality in 4 dimensions which were functional software, implementation, performance interface and content. User satisfaction in 3 dimensions

including functional software, implementation and performance interface was also evaluated. The response format was a Likert-type rating scale ranging from 1-lowest, to 2-low, 3-moderate, 4-high, and 5-highest.⁸ Application quality was evaluated by experts in educational technology and pharmacists. User satisfaction was evaluated by members of health-care teams at sub-district health-promoting hospitals, Ongkharak hospital network, Nakhonnayok.

Mean score and standard deviation of each dimension were calculated and interpreted as quality level and satisfaction level.

Results

Data Collection

List of medicines was composed of 60 items including 43 oral preparations (71.67%), 14 injections (23.33%) and 12 topical preparations (20.00%). Based on interview, lack of pharmacists and appropriate medicinal database was a main cause of medication errors found in sub-district health-promoting hospitals. In addition, non-systematic record and transfer of patient data and medical problems due to improper tools were considered most problematic in home-visiting program.

Application Development

Logo, layout, and login window of application “Hongya Tambon” were shown in Figure 1, 2 and 3, respectively.



Figure 1 Logo of application “Hongya Tambon.”

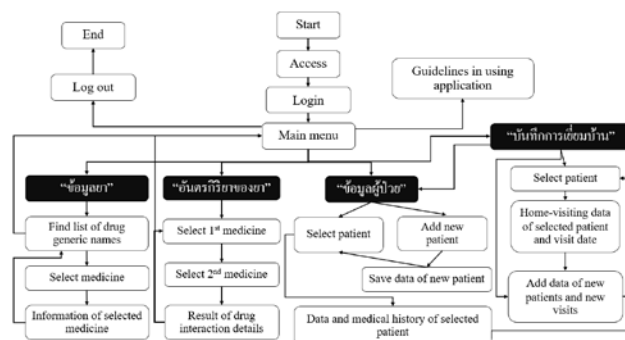


Figure 2 Layout of application “Hongya Tambon.”



Figure 3 Login window of application “Hongya Tambon.”

Main menu of application “Hongya Tambon”, as shown in Figure 4, comprised 5 menus which were “drug information” or “ข้อมูลยา”, “drug interaction” or “อันตรกิริยาของยา”, “patient information” or “ข้อมูลผู้ป่วย”, “home visit record” or “ข้อมูลการเยี่ยมบ้าน” and “how to use” or “วิธีใช้งาน.”



Figure 4 Main menu of application “Hongya Tambon” application.

Menu “drug information” or “ข้อมูลยา” showed the list of drug generic names containing searched letters (Figure 5) and information of selected medicine was displayed by clicking on drug generic name (Figure 6).



Figure 5 List of drug generic names “รายการยา.”



Figure 6 Information of selected medicine “drug information.”

Menu “drug interaction” or “อันตรกิริยาของยา” showed list of drug generic names having interaction with selected medicine (Figure 7) and drug interaction details were displayed by clicking on drug generic name (Figure 8).

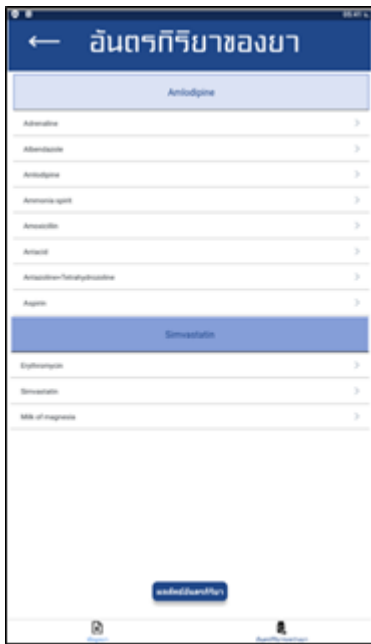


Figure 7 List of drug generic names having interaction with selected medicine “อันตรกิริยาของยา.”



Figure 8 Drug interaction details “คู่ยาที่เกิดอันตรกิริยา.”

Menu “patient information” or “ข้อมูลผู้ป่วย” showed list of patient names in database (Figure 9) and data and medical history of selected patient were revealed by clicking on patient name (Figure 10). Moreover, location of patient home could be displayed on Google Map as shown in Figure 11. Data of

new patients could be added and data correction could be done in this menu.

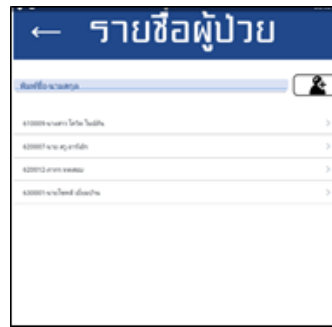


Figure 9 List of patient names in database.



Figure 10 Data and medical problems of selected patient “ข้อมูลผู้ป่วย.”

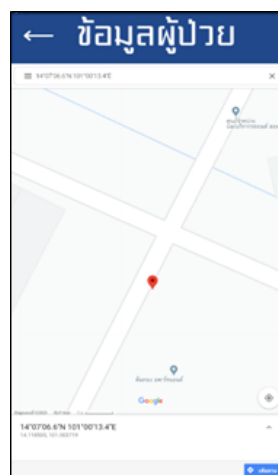


Figure 11 Location of patient home on Google Map.

Menu “record of home visit” or “บันทึกการเยี่ยมบ้าน” showed home-visiting data of selected patient and visit date (Figure 12). Data of new patients and new visits could be added in this menu.



Figure 12 Home-visiting data of selected patient and visit date “record of home visit” or “บันทึกการเยี่ยมบ้าน.”

Menu “how to use” or “วิธีใช้งาน” contained comprehensive guidelines in using application “Hongya Tambon” for new users.

Application Evaluation and Data Analysis

Application “Hongya Tambon” was evaluated for quality and user satisfaction. The results demonstrated that application quality was at excellent level in 1 dimension which was implementation while user satisfaction was at excellent level in 2 dimensions which were functional software and implementation, as shown in Tables 1 and 2, respectively.

Table 1 Quality evaluation scores of the application “Hongya Tambon”

Dimension	Quality score, mean (± SD)	Quality level
Functional software	4.08 (±0.52)	Good
Implementation	4.75 (±0.45)	Excellent
Performance interface	4.33 (±0.49)	Good
Content	4.14 (±0.79)	Good

Table 2 User satisfaction evaluation scores.

Dimension	Satisfaction score, mean (± SD)	Satisfaction level
Functional software	4.67 (±0.49)	Excellent
Implementation	4.75 (±0.45)	Excellent
Performance interface	4.50 (±0.46)	Good

Discussions and Conclusion

Based on the interview, lack of pharmacists at sub-district health-promoting hospitals and non-systematic record and transfer of patient data and medical problems in home-visiting program have been considered most severe problems resulting in medication errors and failure of patient following up. Application “Hongya Tambon” was developed to solve the problems and ease tasks specific to sub-district health-promoting hospitals in Thailand. Medicinal database implanted in the application is in Thai language and relatively small as it contains information of only 60 medicines which are available in sub-district health-promoting hospitals. Therefore, it is user friendly and able to respond quickly, thereby helping reduce service time. All medicinal contents are from reliable tertiary data sources and, thus, the application can help increase treatment effectiveness and patient safety. Besides, the application is substantially useful in home-visiting program as patient data, medical problems and other information, such as photographs and home address, can be systematically recorded and transferred among multi-disciplinary teams.

According to the evaluation by experts in educational technology, pharmacists and application users, mean quality and user satisfaction scores of application “Hongya Tambon” were not less than 3.51 in 4 dimensions including functional software, implementation, performance interface and content. This indicates the validity and reliability of the application in routine use.

However, the validity and reliability of the application should be confirmed by larger population using evaluation forms subject to Item-Objective Congruence Index (IOC) assessment. Also, the extent of reduced medication errors and improved patient following up in home-visiting program cannot be shown in this research as no previous relevant data are available.

Conclusion

Application “Hongya Tambon” was developed to solve problems and improve effectiveness of medical services,

including home- visiting program, in sub- district health- promoting hospitals, Ongkharak hospital network, Nakhonnayok. It could decrease the impact caused by lack of pharmacists which is still an unsolved problem. The application was considered to be a valid, reliable, task-specific and user friendly tool for routine use in sub-district health- promoting hospitals throughout Thailand.

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