

STUDY PROTOCOL

Health Promotion Interventions Using WeChat Apps in Improving Patient Satisfaction with Primary Health Services in Xian China: Protocol of a Randomized Controlled Trial

Huan Li^{1,2}, Kye Mon Min Swe³, Mohammed Abdulrazzaq Jabbar⁴, Siew Mooi Ching⁵

¹ Shaanxi Energy institute, Xianyang, China.

² M. Kandiah Faculty of Medicine and Health Sciences, University Tunku Abdul Rahman, Malaysia.

³ School of Medicine, Newcastle University Medicine Malaysia, Johor, Malaysia

⁴ MOHAMMED ABDULRAZZAQ JABBAR, Department of Community Medicine, College of Medicine, Gulf Medical University, Ajman, UAE.

⁵ Department of Family Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia.

ABSTRACT

Introduction: Health promotion can effectively help people change their way of life and plays an important role in primary health care. Patient satisfaction is a measure of the effectiveness of healthcare services and has become a key indicator of the comprehensive evaluation of the medical system. WeChat is a social software widely used in China. This study explores the effectiveness of health promotion interventions via WeChat apps in improving patients' satisfaction with primary health services. **Methods:** Patients who volunteered to participate in the study and met sample inclusion criteria were randomly selected from Xian Primary Health Service Centre, Shaanxi Province, China, and Randomized into the intervention group and control group for a Randomized controlled trial. The intervention group will receive health education intervention, the main intervention measures include 1. What is community health service; 2. The rights or benefits enjoyed by patients attending community health service centres; 3. The basic workflow of staff; 4. Introduction of routine physical examination items for patients; 5. Popularizing common medical knowledge; 6. Self-protection and nutrition during COVID-19; 8. Communication skills between patients and medical workers; 9. Discuss. The control group received the usual greeting and care. Outcome Measurements: Social demographic questionnaire and PSQ-18 questionnaire. **Discussion:** This study provides health promotion interventions for patients in primary health centres through WeChat to explore the factors affecting patient satisfaction and effective intervention measures. The research results will provide suggestions for improving primary healthcare services and provide a referential experience for health education research.

Malaysian Journal of Medicine and Health Sciences (2024) 20(2): 374-378. doi:10.47836/mjmhs.20.2.47

Keywords: Health promotion interventions, Patient satisfaction, primary health services, randomized controlled trial, WeChat

Corresponding Author:

Kye Mon Min Swe, PhD

Email: khmoneminswe@gmail.com

Tel: +601-115133799

INTRODUCTION

With the development of the economy and the aggravation of the aging population, people's demand for medical services is increasing. At present, the contradiction between the diversified demands of the people for medical services and the limited health resources in China is becoming more and more intense (1, 2). Under the call of the central government to improve the hierarchical diagnosis and treatment model, China attaches great importance to the construction of community health service, constantly improving the

community health service system, and improving the overall level of community health service (3) Community health service institutions, as the main providers of basic medical and health services for community residents, shoulder the important role of providing comprehensive health management and health care for residents (4–6). The quality of community health service directly affects the accessibility, timeliness, and effectiveness of residents' health management. In the long run, the quality of grassroots health services has a profound impact on the implementation of the Healthy China strategy.

Due to the community health service institutions in China have been not given enough attention for historical reasons, some basic health service agencies have been unable to meet the demand of the people increasing day

by day of basic health services. Therefore, community health service institutions to improve their deficiencies, to meet the needs of people for health services in the new period, to improve their serviceability is imminent (7, 8). Patient satisfaction is a measure of the effectiveness of healthcare services and has become a key indicator of the comprehensive evaluation of the medical system. Health promotion can effectively help people change their lifestyle, achieve the best physical, emotional, and other aspects of health, and play an important role in primary health care (9). The purpose of this study was to improve patients' cognition through health promotion, change some incorrect behaviours of patients, enhance patients' understanding and trust in community health services, and explore effective measures that can effectively improve patients' satisfaction with primary health services.

METHODS

Design and setting

Patients who volunteered to participate in the study and met sample inclusion criteria were randomly selected from Xian Primary Health Service Centre, Shaanxi Province, China, and Randomized into the intervention group and control group for a Randomized controlled trial (10).

The intervention group will receive health education intervention, the main intervention measures include 1. What is community health service; 2. The rights or benefits enjoyed by patients attending community health service centres; 3. Basic workflow of staff; 4. Introduction of routine physical examination items for patients; 5. Popularizing common medical knowledge; 6. Self-protection and nutrition during COVID-19; 8. Communication skills between patients and medical workers; 9. Discuss. The control group received only the usual greeting and care (10–13).

Sampling frame

There were 121 community health service centres in Xi 'an, and 12 community health service centres were randomly selected by computer software to conduct intervention research.

Participants Selection criteria

The 12 primary health service centres randomly selected are numbered and the survey time is randomly selected. In each research institution, the first 30 patients who met the inclusion criteria and volunteered to participate were included in the study day, and patients with an odd ranking were included in the intervention group, while patients with an even ranking were included in the control group. Patients were single-blinded, meaning they did not know whether they were in the intervention or control group (14).

The inclusion criteria are as follows :1. Patients were

over 18 years old; 2. The patient can read and write Chinese, communicate normally, understand the content of the questionnaire correctly, and use WeChat to view WeChat pictures, videos, and documents on smartphones. Exclusion criteria are as follows: patients with unconsciousness, mental disorders, cognitive disorders, and patients who were unable to cooperate with the study (14, 15).

Sample size calculation

The required sample size of this study is 210, a total of 105 for the intervention group and 105 control group with an effect size of 0.5. The Type I error probability associated with this test of this null hypothesis is 0.05.

Study Instruments

A sociodemographic questionnaire and patient satisfaction questionnaire (PSQ-18) will be used in the study. PSQ-18 consists of a total of 18 items across 7 dimensions, measuring overall satisfaction (2 items) technical quality (4 items) interpersonal attitudes (2 items) Communication (2 items) Financial aspects (2 items) Time spent with doctors (2 items) and access and convenience (4 items) (14, 15).

Cronbach's Alpha coefficient is used to calculate the internal consistency reliability of the PSQ18 scale. The estimation results selected 18 items of the PSQ-18 scale. All PSQ-18 subscales had generally acceptable internal consistency reliability. The Patient Satisfaction Questionnaires-18 questionnaire has the highest matching degree with this study and has good validity and reliability – 0.89 (16,17,18).

Data collection procedure

Health promotion intervention

WeChat is a free social networking App that is widely used in China. Almost everyone has a WeChat app on their smartphone. This App allows people to communicate and share text, pictures, documents, videos, and other information. They can communicate individually, or set up work and study groups, etc., to conduct education and study in various forms (19, 20).

By analysing 7 dimensions and 18 questions of PSQ-18, we know that national policies and regulations, community health services, medical care, and staff, Patients with concerted efforts many aspects are needed to improve patient satisfaction.

This study can only discuss from the Angle of patients' health promotion intervention factors Through research and analysis of related papers, we aimed at PSQ-18 - 18 a series of questions in the questionnaire (including integrated services, trust between doctor and patient, national health preferential policies to patients in the welfare of the community health centres, the introduction of medical experts Visit time Way, the

medical consultation time and waiting time, doctor-patient communication, community health service centre medical tasks, and related knowledge, etc.) targeted intervention data, to strengthen the publicity of community health service, let patients know more about community health service, to understand the welfare of the community health service centres, eliminate blindness patients cognition of CHS, improve patients' trust So that patients can feel the advantages of community health services. Therefore, the health promotion intervention involves the following 9 items: Primary health service centre (what is the community health service centre, the important medical service it provides, the department setting, the position in China's medical system, etc.), your rights (what benefits do you enjoy when you visit the community health service centre? Quick treatment measures related national policies How to ask for help, etc.) the staff's basic working process (doctors, nurses and technicians work tasks and time, etc.) regular medical check project introduction (the effect of various common check The required time and cost, etc.), popular science (common diseases and small clinic knowledge) COVID - 19 during the protection and nutrition Doctor-patient communication skills medical consultation and discussion (21–25) (Table I).

Survey method

Research investigators will be recruited, who underwent unified training, used unified questionnaires according to unified guidelines, and conducted anonymous surveys with the informed consent of the subjects (26). During the planned survey period, randomly selected patients will be recruited to a certain institution on a certain day. Patients will be selected based on inclusion

and exclusion criteria. The odd number of patients will be selected as the intervention group and the even patients will be selected as the control group. Groups will be constructed separately; single blinding will be applied and there will be no association between the two groups of patients.

The patients will be informed about the study verbally that the investigation is voluntary, their personal information will be kept strictly confidential, and informed consent will be taken electronically. To ensure the accuracy and reliability of the research data, strict quality control is implemented at each stage of the research. The intervention group performed 9 health promotion programs, while the control group distributed some health care and health knowledge about COVID-19 in the work group every day and kept in touch with the patients (27–29).

Intervention group: After the patient is confirmed to participate in this study, the patient's personal WeChat account is first added, and the patient is entered into the intervention group and the control group according to the order of treatment (whether the patient is entered into the intervention group, or the control group is kept secret from the patient). Second, explain the study requirements clearly to the patient. Patients need to pay attention to our work group news and complete the learning of intervention materials on time. They can leave questions in the WeChat group to discuss with other patients, or you can interact with the staff individually. Finally, staff members publish information on health interventions at least once a week and contact the people being intervened to ensure that the interventions are effective.

Control group: Maintain regular contact with patients entering the control group, protect patients' privacy, and respect their legal rights and interests. Regularly post some common disease prevention, family emergency treatment, and prevention methods for COVID-19 (wearing a mask method is a safe distance from dietary advice to wash your hands Recommended daily exercise, etc.), immunization (vaccination matters needing attention Time interval between vaccination way Possible side effects of vaccination contraindications) in the WeChat group. Patients in the control group can also leave questions in the WeChat group, discuss with other patients, and interact with staff alone (20,30).

Data Management and analysis

The responses will be uniformly coded, and the data will be entered and checked to ensure the accuracy of data entry and consistency. Statistical analysis is performed using IBM SPSS version 28 with a significance threshold set at $p < 0.05$. The normality test of Kolmogorov-Smirnov tests will also be examined. Descriptive analysis is used to describe the characteristics of the study respondents. Continuous variables (age, monthly household income)

Table 1: Health Promotion Intervention project

Project	Examples of intervention data
Community health service	What are the community health service centres, the important medical services they provide, the department Settings, their status in China's medical system, etc.
The rights and welfare of patients	What benefits did you enjoy when you visited the community health service centre? Relevant national policy rapid treatment measures how to seek help
Basic workflow of staff	Work tasks and hours of doctors, nurses, and technicians, etc
Introduction of routine medical examination items	The results of various common tests require time and cost, etc
Popularization of science	Common diseases and medical tips
Protection and nutrition during COVID-19	Social distancing, hand hygiene, protein eating, etc
Doctor-patient communication skills	Perspective-taking uses positive words and so on
Medical advice	Improve medical consultation services
discussion	Patient free discussion

were expressed as mean [standard deviation (SD)] or median [interquartile range (IQR)], depending on the normality test results, whether the data is normal or not normally distributed. Categorical independent variables (ethnicity, education, employment, marital status) were expressed as frequencies and percentages. Pair T-test will be used to compare the results of before and after interventions (29).

Ethics approval and consent to participate

The study was authorized by the University Tunku Abdul Rahman (UTAR) Ethical and Scientific Review Committee (2018 Ethics Approval No. 010). The study will be conducted under the Declaration of Helsinki on 2 January 2019 participants after thoroughly reading and understanding the contents of the file, will receive a file of informed consent, and are required to sign at the end of the form electronically, and return it will receive all the participants' informed consent Before recruitment, each participant will understand the purpose of research programs and measuring method of potential risks and benefits Participation will be entirely voluntary they can unsubscribe our WeChat account at any time Contact information for the Study Coordinator will be provided to all participants to address their future questions and concerns.

Strength of study

At present, there is no similar research in China. Beside, this study will summarize effective health education interventions and provide practical recommendations for the development of primary health care services. This study also will provide useful and reliable experience for future health promotion education research.

Study limitations

The limitations of the study can be selection bias (In this study, randomly selected patients voluntarily participated in the survey on the same day, and the results depended on the subjective factors of the patient on that day). Secondly, there may be concealment and blindness of distribution order when sampling. Thirdly, in phase II of the study, patients in the individual intervention group may know each other patients in the control group, which may lead to the disclosure of intervention information, but that cannot be avoided.

Registration

The study has been registered at ClinicalTrials.gov (Identifier: NCT05383638, website: <https://classic.clinicaltrials.gov/ct2/show/NCT05383638>).

DISCUSSION

At present, we haven't found a similar study, there is some research on patient satisfaction, mainly analyses the factors influencing patient satisfaction, not health intervention to promote the research This research will be based on the principle of cognitive behaviour

and empirical evidence to evaluate health promotion intervention effect of RCT, however, some considerations should be considered First of all, most of the intervention data make the patients in the study, different patients may have intervention data understanding, learn the serious degree of difference, the difference may cause interference effect Therefore, we encourage all the participants in the discussion bar or WeChat group of questions will discuss our intervention written materials as far as possible simple, attractive Secondly since participants in the control group were less involved in the trial, we assumed that the control group would have a higher drop-out rate than the intervention group. Therefore, we will keep in touch with all participants, and they will give some WeChat red envelopes during the middle and later stages of the study. Finally, to improve patient satisfaction, not only for patients to carry out health promotion intervention, through this study we can understand where the problem is, who should be responsible for it, through the investigation can find out the cause of patient dissatisfaction, so as to explore measures and countermeasures to improve satisfaction In the evaluation and utilization of satisfaction results, the evaluation work is also extended to the comprehensive management of the hospital, including environmental equipment, technology, quality, price and efficacy, etc., such as strengthening the hospital infrastructure construction to beautify the internal and external environment of the hospital, leaving a good impression on the public appearance of the hospital At the same time to create and adopt measures to make patients satisfied, strictly implement the medical technical standards and operating procedures, to provide patients with high-quality medical services: actively carry out new medical technology projects, to maximize the health needs of patients: improve the hospital logistics support system, to provide patients with satisfactory life services; Pay attention to regular communication with patients, timely understand the needs of patients, from a small point of view, practical convenience for patients to see a doctor, let them feel that the hospital is always everywhere for the sake of patients

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