Randomized controlled trial of the effectiveness of the social media application “Line” for patch test appointments at Contact Dermatitis Clinic compared to the conventional method

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ABSTRACT:

BUNYAVAREE M, ARUNKAJOHNSAK S, BOONCHAI W. RANDOMIZED CONTROLLED TRIAL OF THE EFFECTIVENESS OF THE SOCIAL MEDIA APPLICATION “LINE” FOR PATCH TEST APPOINTMENTS AT CONTACT DERMATITIS CLINIC COMPARED TO THE CONVENTIONAL METHOD. THAI J DERMATOL 2019; 35: 1-8.

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Background: Patch test (PT) appointments are one of a complicated healthcare appointment due to multiple consecutive visits, pre-patch test preparations or bring culprit products on the first test date. The long duration of PT queue can also make patient forgetful. A complete pre-patch test preparation is essential for the best PT benefit.

Objectives: We aim to find the effectively appointment method by comparing the “Line” messaging application and conventional appointment methods.

Materials and Methods: One hundred and twenty patients were equally randomized into 2 groups: Line appointment group or conventional appointment group. Demographic data, spending time of appointment process and error rate were recorded at the PT appointed date.

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Received : 23 April 2018 Revised : 4 May 2018 Accepted : 11 June 2018

Results: The conventional appointment group had higher overall error rate (16.7%) than those in Line appointment group (10.0%) but it was no statistical difference. However, the Line appointment group significantly showed lower time spending in appointment process with high satisfaction rate of the users.

Conclusion: "Line" mobile messaging application is an effectively healthcare appointment reminder and patient's health educations with no limitation of user by mean of age or level of education.

Key words: Appointment, contact dermatitis clinic, effectiveness, Line application, patch test

Introduction

A patch test is a useful investigational procedure to find culprit allergens responsible for allergic contact dermatitis. However, the patch testing process is time consuming and necessitates multiple hospital visits. Patients who are referred by the General Dermatology Clinic for a patch-testing appointment at the Contact Dermatitis Clinic have to understand the patch-test procedure and make appropriate preparations in advance of the scheduled appointment. In particular, they have to be available to attend the clinic on Days 0, 2, 4 and/or Day 7; abstain from taking oral corticosteroids (>20mg/d for 2 weeks); and bring any culprit products for testing on Day 0. Therefore, providing patients with an appropriate and timely reminder to undertake the pre-patch test preparations is important for the maximization of both the patients' benefits and our clinic's efficiency. The satisfactory completion of those preparations contributes significantly to the keeping of test schedules, a reduction in the level of no-show patients, and the yielding of better patch test readings.

Nowadays, wide ranges of digital communication technologies are in general use. In recognition of this development, the literature contains a number of studies on the use of mobile phone-based interventions to improve health services.[1-3] According to a report in January 2016, 34 million Thais (i.e., 50% of the national population) are active mobile social users.[4] There are also 44 million mobile internet users, 94% of which are Line application users; in fact, Thailand is Line's second-largest global market.[5] Therefore, we decided to find an improved and effective appointment method for patch testing patients at the Contact Dermatitis Clinic, Siriraj Hospital, by studying the feasibility of using the highly popular Line messaging application. The secondary aim of the study was to identify any drawbacks of using a modern mobile application, and which patient factors those disadvantages were related to (such as age or education level).

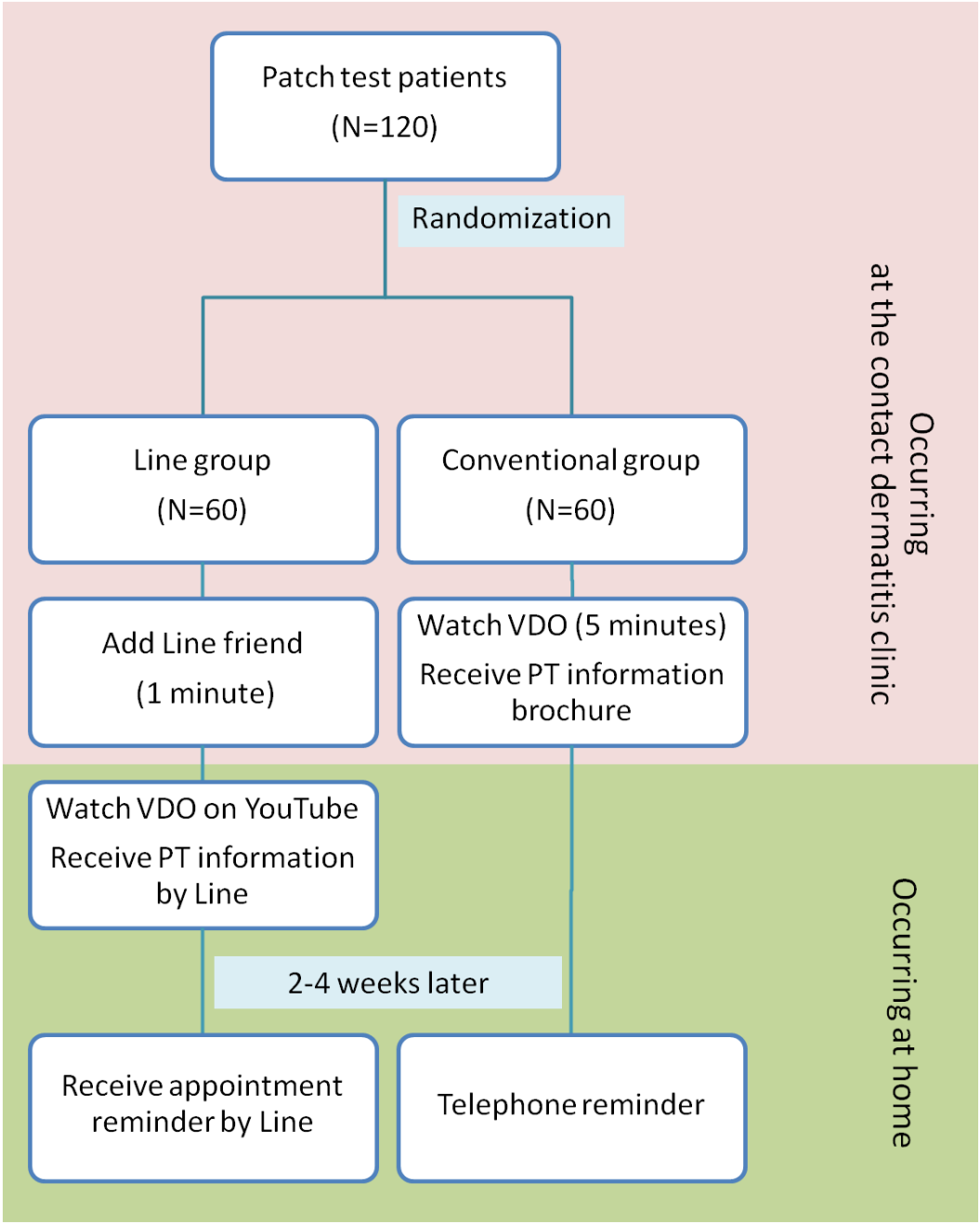

Figure 1 Patient allocations to Line and conventional groups

Table 1 Comparison of appointment methods

	Conventional group N=60	Line group N=60	*P*-value
Demographic data			
Gender, n (%)			0.11
Male, n (%)	11 (18.3)	5 (8.3)	
Female, n (%)	49 (81.7)	55 (91.7)	
Age (years), median (min, max)	42 (7,18)	38 (7,18)	0.72
≤60 years	55 (91.7)	57 (95.0)	
>60 years	5 (8.3)	3 (5.0)	
Educational background			0.82
< Bachelor degree, n (%)	12 (20.0)	11 (18.3)	
≥ Bachelor degree, n (%)	48 (80.0)	49 (81.7)	
Accuracy of patch test preparation			
Rightness of pre-patch test preparations			0.28
Complete, n (%)	50 (83.3)	54 (90.0)	
Incomplete, n (%)	10 (16.7)	6 (10.0)	
Bringing of culprit products or substances			0.57
Complete, n (%)	52 (86.7)	54 (90.0)	
Incomplete, n (%)	8 (13.3)	6 (10.0)	
Prohibited medicines			0.50
Complete the cessation period, n (%)	58 (96.7)	60 (100)	
Incomplete the cessation period, n (%)	2 (3.3)	0 (0.0)	
Time spent (minute) on making appointment median (min, max)	10 (5,25)	5 (2,10)	0.00*
Attendance rate	60 (100)	60 (100)	

*, statistical significance $p< 0.05$

Materials and methods

This randomized controlled trial was carried out at the Contact Dermatitis Clinic, Siriraj Hospital. The study was conducted from January to November 2017.

Study population and design

The patients recruited were those who had a patch testing appointment, were willing to participate in the study, were aged ≥18 years, and possessed a smart mobile phone with the Line application. The sample size was calculated to be 120 subjects; this was based on the overall appointment error rate (11.1%) for the currently-used conventional appointment method. A randomization sequence was generated prior to the start of the study using the Research Randomizer website (https://www.randomizer.org). Patients were enrolled sequentially and were assigned an appointment method in accordance with the randomization sequence. The subjects were equally randomized into two groups: 60 were in the "Line group", while the remainder were in the "conventional group" and received appointments by the usual method (Figure 1). The following were recorded: demographic data; the time spent on the appointment-making process; and the error rates for pre-patch test preparations, the bringing of culprit products for testing, and the cessation of prohibited medications (Table 1).

The making of appointments and giving of advice was performed by an experienced technician (M.B.). The patients in the conventional appointment group spent time with M.B. in the clinic watching a computer-based video on how to perform patch testing, and received brochures for review at home. They were later reminded by phone of the test date and the need to bring their culprit product(s) with them on the first day of the patch test. In contrast, the patients in the Line appointment group only needed to add the clinic as a Line friend before they departed the clinic. They subsequently received the following via the Line application: information on the patch test, a YouTube link to the video on how to perform patch testing, and a reminder of the test date and the need to bring their culprit product(s) on the first day of the patch test.

The patients of the conventional and the Line groups were able to have 2-way communications with clinic staff, if and as needed, via phone and Line, respectively. In addition, the patients in the Line group filled out a satisfaction survey that comprised 4 brief questions graded by 4 levels

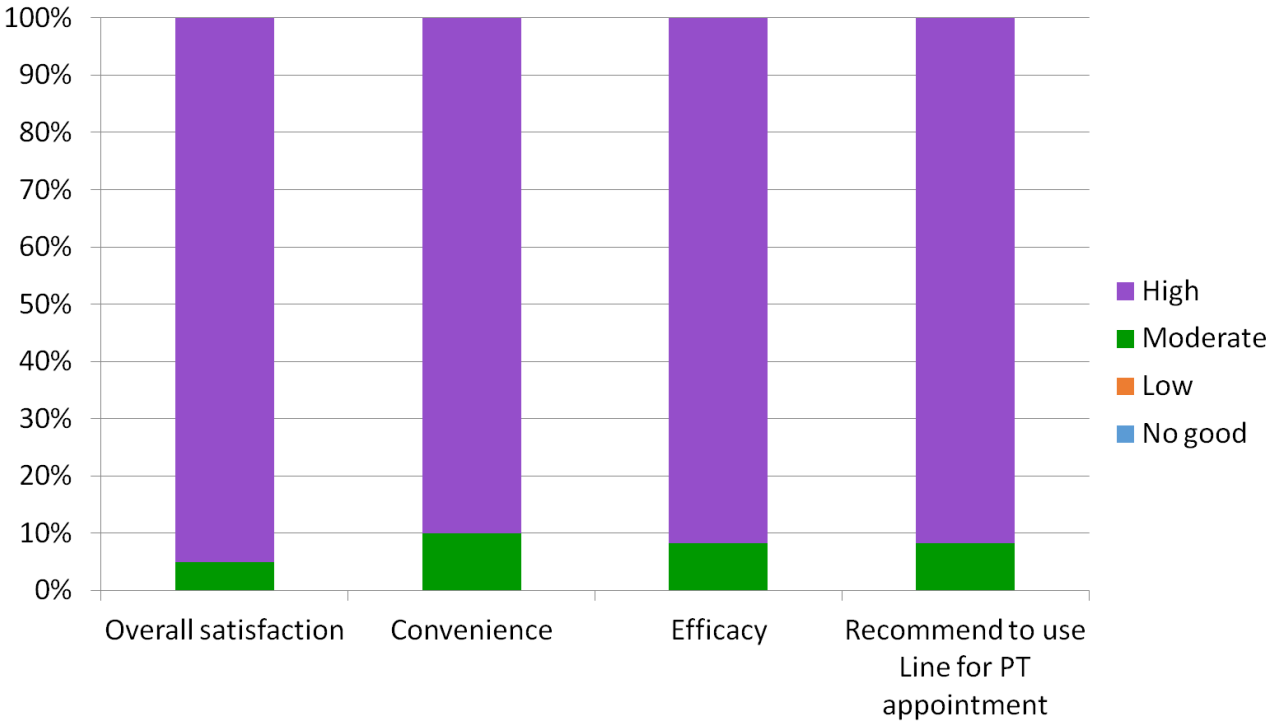

Figure 2 Satisfaction survey of patients with Line appointments

Statistical analysis

The data was statistically processed by describing quantitative data (age) as mean and standard deviation, and describing qualitative data as number and percentage. Two qualitative data groups were compared with the Chi-square test; statistical significance was set at a *p*-value of <0.05.

Results

The demographic data of both study groups were comparable (Table 1). Females predominated in the patch test population, as per our previous study.[6] The lowest educational background was primary school (1.7%) but literate. Most of the patients possessed a bachelor degree. The patients in the conventional group had higher error rates than those in the Line group for pre-patch test preparations (16.7% vs 10.0%); the bringing of culprit products for testing (13.3% vs 10.0%); and the cessation of prohibited medications, namely, systemic corticosteroid intake (3.3% vs 0.0%). However, there was no statistical difference.

There was a significant difference, however, in the time needed by the technician to make an

appointment: a median of only 5 minutes for members of the Line group, which was half that required for the conventional group.

As for the satisfaction survey for the Line method of patient education and appointment reminders, more than 90% of participants expressed satisfaction with the method in terms of its convenience and its high efficacy for reminding them of appointments. The patients highly recommended using the Line method for patch test appointments.

Discussion

An effective appointment method system reduces a clinic's workloads and operating expenses while improving patients' accessibility to the clinic's services. Using a mobile communication application is both modern and in the best interests of stakeholders. We intend to utilize mobile messaging applications not only to improve doctor-patient communications relating to appointment reminders but also to educate patients. There are many mobile messaging applications nowadays, such as WhatsApp, Facebook Messenger, KakaoTalk, Skype, Viber and Line. The popularity of such applications differs from country to country; in Thailand's case, the Line application is used extensively.

We developed an appointment reminder infographic to draw the interest of Line users, and a YouTube video clip containing patch test information for use by members of the Line appointment group. The advantage of this approach is that the patients can replay the clip as often as they like to gain a full understanding. Furthermore, our findings showed that the Line method allowed appointments to be made in half the time of the conventional method, which represents a significant time reduction.

We had been concerned that older or lower-educated patients might find using a smart-phone based application to be perplexing or frustrating. However, our results showed that there were no gender, age or educational limitations related to the use of Line in an appointment method system compared to the conventional appointment process.

A Cochrane review of mobile phone messaging reminders for healthcare appointments showed no difference in the attendance-to-appointment rates of a mobile phone message reminder group (78.6%) and a phone call reminder group (80.3%), both of which were significantly better than the no reminder group.[2] In addition, no adverse effects were found during the study period, such as loss of privacy, data misinterpretation, or message delivery failure[2], which was identical to our study's findings.

In the case of the error rates for the pre-patch test preparations, the bringing of culprit

products for testing, and the cessation of prohibited medications, similar results were achieved for both appointment groups. Their attendance rates were also identical. The overall satisfaction of the Line users with the new system's convenience and efficacy was very high (95%). Most of the Line users recommended continuing its use for Contact Dermatitis Clinic appointments.

Limitation of the study was small sample size therefore the changes were not obvious.

In conclusion, the Line mobile messaging application can be effectively used for both healthcare appointment reminder systems and patient health education. We suggest using the most popular application in the region concerned to capitalize on patients' feelings of familiarity and hence increase their likelihood of accepting a technologically-based appointment and health-education system.

Acknowledgements

We thank Assistant Professor Chulaluk Komoltri, Ph.D., Division of Clinical Research, Faculty of Medicine, Siriraj Hospital, Mahidol University, for advice on the statistical analyses and the R2R, Faculty of Medicine, Siriraj Hospital, for funding the study.

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