

Views and Practice

Mobile application in dermatology: a useful tool for better communication and patient education

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Introduction

Mobile healthcare has recently become popular with the widespread use of wireless devices like smartphones, which is a promising tool due to a wide user base and easy access.¹ Usage of mobile application in medicine depends largely on the country's hardware infrastructure, distribution of the population and medical resources, and user awareness and acceptance of mobile medical applications.² Korea has a high smartphone use rate of 85% and a high preference for mobile application.³ Although most mobile healthcare systems are being developed for emergency care and chronic illness management, consumers using mobile applications for their skin care are also increasing with heightened interests in general skin care and active control of the troublesome skin

conditions.^{1,4,5} However, few studies have evaluated smartphone-based application for skin care in Korea. The objectives of the study were to understand the dermatological patients' needs for easily-accessible knowledge, to see if mobile application is of practical use from the patients' perspective, and eventually to find an appropriate interactive tool to offer personalised feedback to patients.

Methods

We surveyed patients visiting the Dermatology clinic at Gachon University Gil Medical Center in Incheon, South Korea about their awareness and behavioural pattern regarding medical information acquisition via mobile application. Questioned items included perceived causes of skin diseases, desired information available on the mobile application, the degree of reliability of the information acquired on the Internet, and the intention of using skin health care mobile services. The responses among disease groups were compared using Chi-square test. Statistical analysis was performed using GraphPad Prism software (GraphPad Software, Inc., La Jolla, CA). A p-value of <0.05 was considered significant in all statistical analyses.

Results

Among the 87 patients recruited, there were 34 males and 53 females. Twenty-six patients

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(29.9%) had atopic dermatitis (AD), 29 (33.3%) had allergic contact dermatitis (ACD) and 32 (36.8%) had acne. The sociodemographic characteristics of the subjects are detailed in Table 1. The response pattern was similar in all groups, but there were slight differences among disease groups. When asked about what they considered the cause of their skin diseases, food was rated high in all groups (31.0%), while AD patients mostly blamed environmental factors like air pollution (34.6%), and most acne patients thought stress was responsible for their acne (31.25%) ($\chi^2=35.66$, $p<0.0001$, Figure 1a). The most wanted information on the mobile application was the cause of skin diseases in all groups (64.4%). Since AD and acne has a chronic

course with multiple recurrences, patents focused more on preventive measures (19.2% and 21.9%, respectively) and treatment modalities (19.2% and 15.6%, respectively) ($\chi^2=16.32$, $p=0.012$, Figure 1b). They also requested functions such as continuous monitoring of their skin condition (32.2%), self-skin-care methods (32.2%), appropriate care according to weather (9.2%) and information on cosmetic products (14.9%).

Discussion

In our previous study reporting the same survey done in general population of 1000 subjects,⁴ 47.1% used mobile skin care applications. However, in this study, only 8.0% of dermatological patients had used mobile skin care applications; 65.5% replied that they did not know about any mobile skin care applications, and 26.5% did not use them although they were aware of the mobile applications. Regarding the degree of reliability of the information on the Internet, dermatological patients showed a higher rate of negative view than the general population (17.2% vs 2.6%, $p<0.001$), while a similar proportion in both groups showed a positive view (36.8% vs 40.7%) (Figure 1c, the data from general population was not previously reported in ref.4). Neither group "really" trusted the information on the Internet. Patients might find that their knowledge was incorrect after their consultation with a dermatologist, and seemed to realise that a lot of general information was not accurate or not applicable to everyone. However, when asked about their intention to use a mobile app in the future, 62.1% responded "likely" or "very likely." Atopic dermatitis patients were more reluctant to use them (57.7% more than likely), while ACD patients had the highest rate (65.5%) of positive response ($\chi^2=12.14$, $p=0.016$, Figure 1d). Mean score on 5-point scale was 3.64 with 3.73 in AD, 3.66 in ACD, and 3.55 in acne, indicating that AD patients have a stronger intention to use them. The limitation of

Table 1. The sociodemographic characteristics of the subjects

Classification		n (%)
Disease	Atopic Dermatitis	26 (29.9)
	Allergic Contact Dermatitis	29 (33.3)
	Acne	32 (36.8)
Gender	Male	34 (39.1)
	Female	53 (60.9)
Age (years)	Teens	16 (18.4)
	20-30	35 (40.2)
	30-40	24 (27.6)
	40-50	6 (6.9)
	50-60	4 (4.6)
	>60	2 (2.3)
	Occupation	Self-employed
Sales/Service/General		7 (8.0)
Office work/technicalwork		21 (24.1)
Management		
Administration		
Professional		7 (8.0)
Housewife		12 (13.8)
Student		28 (32.2)
Unemployed/other		7 (8.0)
Marital status	Single	56 (64.4)
	Married	30 (35.5)
	Divorced/Bereaved	1 (1.1)

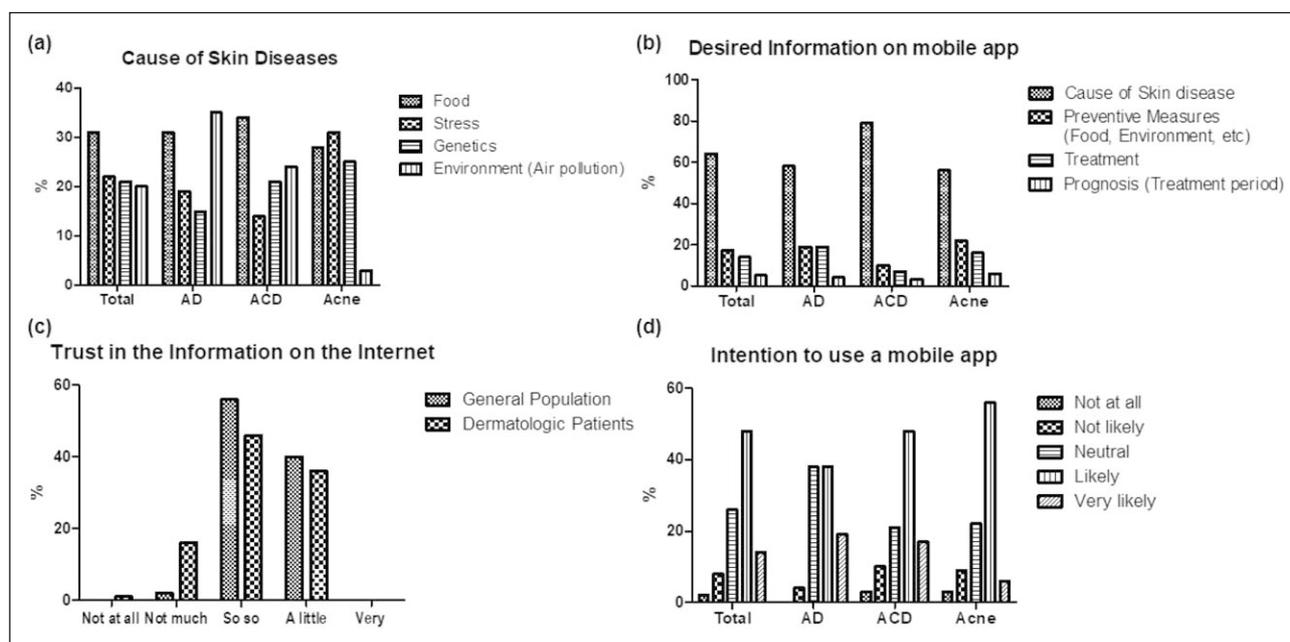


Figure 1. (a) Perceived cause of skin diseases in all recruited patients (87 subjects) and among diseases groups (atopic dermatitis, AD: 26 subjects; allergic contact dermatitis, ACD: 29 subjects; and acne: 32 subjects). (b) Desired information from the mobile skin healthcare applications in recruited patients and among diseases groups. (c) The degree of reliability of the information acquired via mobile application or Internet in general population of 1000 subjects and 87 dermatology patients. (d) The respondents' willingness to use a mobile skin healthcare application in the future in all patients and among diseases groups.

this study is that the survey was done in a single tertiary dermatology clinic with a small subject population of 87 patients. Therefore, further nationwide multicentre studies are required on this issue.

Conclusion

Mobile applications cannot completely replace a personal consultation with a doctor. However, this study showed that smartphone-based applications for skin healthcare have a potential in Korea as an effective window to educate and continuously monitor patients with active intervention and provide updates on disease-specific information fulfilling the patients' demands from the doctor. The result of this study provides a basis for developing skincare mobile service according to the needs of both patients and dermatologists.

In conclusion, it is important for the dermatologists to be actively involved in developing and managing mobile applications to provide evidence-based information and detailed medically-correct feedback to the patients.

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Conflict of Interests

The authors state no conflict of interest.

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