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Perceived Effects of Usage of Mobile Phone Applications for Nutritional Benefits and Factors Affecting the Usage

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Abstract

Mobile applications for nutritional benefits are effective in improving the quality of health, though factors exist as to their usage. The study sought to investigate the perception of the effects of the applications and the factors affecting the use of the applications in the Kingdom of Saudi Arabia. More than half of the studied patients (52.48%) reported not using the applications. The effectiveness of the applications, however, is held among majority of clients, users and non-users of the applications, and dietetics professionals, with perceived effects such as helping to find sought information and improving health. The applications, perceived usefulness of the applications and the need for personalized care, however, are factors affecting their use. Moderating the factors to support use of the applications can improve quality of health in the Kingdom.

Introduction

The Theory of Dependent Care, under the umbrella Self-Care Deficit Theory, provides for the role of social dependence in the realization of care needs under self-care deficit **[1]**. Self-care deficit, a situation in which a person cannot meet care needs through self-care initiatives, may exist, and this necessitates the need for assistance from other people, including from nursing professionals. Nursing roles, according to the Self-Care Deficit Theory, become necessary when a self-care deficit exists **[1]**. The professional caregiver role, as a result, is necessary when a patient and social agents around a patient are not able to meet a patient's care needs. Technological developments, through mobile applications, have improved the concept of dependent care by integrating the reliance on the applications in the provision of care **[2]**. Mobile applications exist with integrated statistics that determine a person's needs and develops plants for meeting the needs **[2].** The applications, as a result, play the role of the dependent care agent and can facilitate the realization of self-care needs. The significance of nutrition to lifestyle diseases and weight management, together with the possible roles of mobile applications in designing diets and reminding patients about medications and appointments **[2]**, establish the importance of diet-based mobile applications.

Empirical literature on the use of mobile applications for nutritional purposes supports the significance of the application in the agency role under the self-care deficit theory. Mobile applications for the management of diet-related complications have been associated with changes in dietary intake and behavior for the effective self-management of health conditions **[3]**. An intervention to support healthy eating using mobile technology has also been identified as having the capacity to promote healthy eating among college females from minority ethnic groups **[4]**. The effectiveness of mobile applications in improving health outcomes through changes in nutritional behavior, however, does not guarantee the use of the applications. The effects of some factors on the use of the application have been reported. Usefulness and enjoyableness of an application are some of the significant factors to the reliance on a mobile application for nutritional benefits **[5]**. People are likely to rely on a mobile application if it offers utility about nutritional needs and if its use involves

fun. Social norms around an individual, such as cultural values about the use of technology, also influence the use of mobile applications for nutritional use. Individuals' innovativeness also influences the use of mobile applications for nutritional benefits with innovative people more likely, than are non-innovative people, to use the applications **[5].**

The use of mobile applications when ordering food from restaurants also identifies the significance of factors to the reliance on the application in nutritional decision-making. Social influence affects people's intention to use mobile applications in the decision to order foods from restaurants **[5]**. The influence is consistent with the effects of social norms on the use of mobile applications to inform nutritional behavior **[5]**. Anticipated usability of a mobile application, anticipated ease of use of an application, and an individual's level of innovativeness, which also influence the decision to use mobile applications to make decisions on diets **[5]**. Anxiety has also been associated with the avoidance of the applications **[6]** and this consistent with the significance of expectations on usefulness and ease of use of applications **[5, 7].** Mobile applications for nutritional benefits, therefore, are significant to the realization of the quality of health through enhanced self-care **[1, 2]**.

Background of the Study

A dearth of knowledge, however, exists on the perceived effects of the applications among the Saudi population and factors affecting use of the applications, which are important to the realization of the health benefits of the applications. An understanding of the perception of the effects of the application as well as factors that could affect the use of the applications in the Kingdom of Saudi Arabia, therefore, is necessary.

The study, based on the knowledge gap on the effects of the usage and factors to the usage of mobile applications for nutritional benefits in Saudi Arabia, seeks to establish the perception of the effectiveness of the mobile applications and determinants of the usage in the Kingdom. The following are the specific objectives of the study.

- To establish the perceived effects of mobile applications in realizing nutritional benefits in the Kingdom of Saudi Arabia
- To identify factors influencing the use of mobile applications for nutritional benefits in the Kingdom of Saudi Arabia
- The following research questions were explored to bridge the knowledge gap in the usage and effects of the usage of mobile applications for nutritional benefits.
- What are the effects of the use of mobile applications for nutritional benefits in the Kingdom of Saudi Arabia?
- What factors influence the use of mobile applications for nutritional benefits in the Kingdom?

Methods

The mixed research method, based on the pragmatic assumptions, was used for the study. The pragmatic paradigm of knowledge development assumes a pluralistic approach in the application of research procedures **[8]**. This paradigm focuses on the problem to be solved, instead of the methods for solving the problem, and uses applicable measures in data collection and analysis. Best methods, as a result, can be combined to aid the solution of an identified research problem. In our case we used both a survey to obtain the quantitative data required to produce generalizable results and test the influence of the factors affecting adoption of the apps, as well as interviews (were these 'semi-structured interviews'?) to produce the qualitative data needed to provide more in-depth information from the dietetic professionals' perspectives'. The questionnaire was constructed using questions that had been used in other surveys, thus their reliability had already been tested. The survey and interview schedule were both piloted with participants from the two target populations and minor adjustments made in line with recommendations.

Patients using an online system to obtain healthcare information in the Kingdom of Saudi Arabia and professionals in the field of nutrition in the Kingdom form the population of the study. A sample of 423 patients and 19 dietetics professionals was used. An online questionnaire was used to collect survey data from the patients while interviews, based on participants' experiences in the delivery of care to patients with dietary needs, were used to collect qualitative data. Participants in the survey were recruited from an online platform, from which the participants sought care information, and links were offered to the participants for the completion of the questionnaire on an online data collection platform. Random sampling was used to generate the final sample from the developed sample frame and acceptance to participate in the study, following the disclosure of information on the study and the provision of informed consent.

The care professionals were sampled conveniently, based on the ease of access to their care facilities, and informed consent was obtained before interviews were conducted within the professionals' facilities. Autonomy and anonymity were the significant ethical issues to the study and the provision for informed consent, the respect of participants' views and the restricted scope of the targeted data to personally non-identifiable information addressed related concerns to the issues.

Results

The study sought to investigate the perceptions of the effects of mobile applications for nutritional benefits and factors affecting the use of the applications in the Kingdom of Saudi Arabia. Data from a survey and interviews were used.

Four hundred and twenty-three people completed the questionnaire and 47.52 percent of these were male. The age

of the participants ranged from 18 years to 65 years, though a majority was aged 18 to 29 years (49.41 percent) and 30 to 39 years (31.68 percent). Participants aged 50 to 59 years only accounted for 5.44 percent of the sample and those aged 60 to 65 years accounted for 0.71 percent of the sample. Nineteen dietetics professionals participated in the interviews. The professionals were from different areas of specialization and a range of years of experience. Three of the participants had less than a year of experience in dietetics, six of the participants had one to two years of experience, three of the participants had three to four years of experience, and two had five to six years of experience. Five of the professionals had more than seven years of experience.

Effectiveness

About 47 percent of the survey participants reported using mobile applications for nutritional benefits, with 23.17 percent reporting occasional use of the application and 24.35 percent reporting the use when a need arises. A majority of the respondents who reported the use of the applications noted the applications help in finding sought information (67.23 percent) and improving health (62.18 percent). More than half of the non-users of the applications (52.27 percent) reported positive perceptions of the applications and about half of the non-users (50.57 percent) believed the applications helps improve health, compared to only 10.23 percent that believed the applications are not useful. A greater percentage of the non-users (28.98 percent), however, reported the unreliability of the applications than the percentage that reported the reliability of the applications (25.57 percent).

The interviews with the dieticians also identified the role of the applications in providing useful information. Reasons for the professionals' support for the applications, such as provisions of needed information, suitability for illiterate people, and effectiveness in promoting health, also identify the effects of the applications. The applications also promote an understanding of diet. The effectiveness, however, and according to the professionals, should not substitute the need to attend clinics or have follow-ups. A majority of the professionals, 13 out of 19, also reported the effectiveness of the applications in promoting understanding of diet and health, through 17 of the 19 professionals noted the insufficiency of the applications to ensure good health.

Factors Affecting Use of the Applications

The ability to operate the mobile applications is one of the factors of their usage and this undermines the usage among patients. A majority of the non-users (70.45 percent) reported difficulties with using mobile applications. The usefulness of the applications and the need for personalized interventions were reported among the professionals as factors to the usage of the applications.

Discussion

The results identify perceived effects of the applications, among a majority of patients (users and non-users) and professionals, to the realization of nutritional benefits. Some of the participants, however, reported non-effectiveness of the applications and factors such as the ability to operate the applications, perceived usefulness of the applications and the need for personalized care explain the variation in perceptions of the usefulness of the apps. The reported effectiveness is consistent with the role of the applications in aiding self-care **[1, 2]** through the provision of the necessary information for informed dietary decisions. The reported effects of dietary applications in changing people's nutritional behavior **[3]** also support the established effectiveness in the current study. The significance of a person's innovativeness to use of the applications is consistent with the results on the role of the ability to operate the applications on the usage **[6, 5]** The perception of the usefulness of an application **[5]** and its effects on anxiety **[8]** also support the identified role of perceived usefulness to the reliance on the applications.

The consistency between the results of this study and existing literature establishes the validity of the developed results. The consistency between the results of the quantitative and qualitative aspects of the study also supports the validity of the results. The subjective scope of the study is the major limitation but the consistency of the responses between the patients and the professionals establishes the validity of the results. Addressing the negative effects of the factors can offer a basis for increased usage of the applications in the Kingdom for an improved benefit of the applications.

Conclusion

The study investigated the perceived effectiveness of mobile applications for nutritional benefits and factors to the usage of the applications in the Kingdom of Saudi Arabia. Results identify the perceived effectiveness of the applications among patients and dietetics professionals and the significance of innovativeness, perceived usefulness and the need for specialized care as the determinants of the use of the applications. Addressing the negative implications of the identified factors can improve the usage and benefits of the mobile applications on the quality of health.

It is vital that patients have the information they need about nutrition. Many patients, especially those living far from a health facility, find it hard to attend appointments with a dietary specialist. A mobile application can provide the information they need as well as allowing them to keep a record of what they eat and drink. However, these applications need to be easy-to-use and the information needs to be reliable and perceived as such.

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