Role of Social Support in Self-management of Health

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Abstract

Social support is the physical and emotional comfort given to someone in times of need or crises and it is especially important for maintaining good physical and mental health. Despite the contribution of intelligent technological devices, which have led to the availability of various types of social support systems, the latter are still not widely known to many. These support systems are currently available in many versions, such as in tablets and smartphones, where many health information systems have been created specifically to accommodate to the needs of current mobile healthcare consumers. In this paper, we systematically review the role of social support provided via health information systems and report a qualitative study that investigates the perceptions of healthcare professionals and consumers towards incorporating social support in self-care applications. The results obtained through our study reveal that social support is associated with better health management and is a vital component to be incorporated in any novel health information system. Likewise, the results are supported by our qualitative study that indicates healthcare professionals and consumers emphasize the inclusion of the social support component in self-care applications to achieve better health outcomes.

Keywords: Social Support; Self-care; Health Self-management; Health Information Systems; Health Informatics.

Introduction

The notion that social support can impact a person's health is indeed appealing. Persons of different age groups may differ in the type of social support they need to improve their health. The significance of having social relationships through healthcare treatments and the maintenance of one's health and well-being has attracted the attention of scientists and practitioners from all over the world (Lee, Arozullah, & Cho, 2004). Social support can be in the form of either spoken or unspoken contact. It exists between the providers and the recipients who control and remove all doubts in relation to the situations the recipients are in. These could be cases where persons find themselves in critical situations and thereby need assistance in getting motivation or listening to words of hope and encouragement, which deter for example suicidal tendencies. Social support is a big help to those facing relationship and marital-related problems too. Providing them with social support can help create the perception of a more personal control over the person's life. There are various types of social support category systems that are offered via health support systems. Among the types of social supports available are esteem support, emotional support, informational support, network support, and tangible assistance (Adams, Baumer, & Gay, 2014). Details of the types of social support systems are summarized in Table 1. Figure 1 shows the types of social support provided in healthcare.

Social support has played an important role in changing the lives of many individuals from various situations. Social support has help prevent adolescent suicidal ideation and suicidal attempts among adolescents (Miller, Esposito-Smythers, & Leichtweis, 2015). Health behaviors and health status of patients have also improved tremendously with the influence of social support (Glanz, Rimer, & Viswanath, 2008). Besides that, there are many systems that have been primarily created to provide social support to users. For instance, PatientsLikeMe (Heywood, 2005) provides support, which focuses mainly on persons suffering from all types of cancer, problems related to endocrine glands, developmental and chromosomal problems, digestive and intestinal problems and various other medical problems. Through this system, patients can know their options by comparing treatments, symptoms, and experiences with people who know what the patient is going through. Moreover, they can connect with others by giving and receiving support, because of the feeling 'we are all in this together'. Patients will be able to take action by tracking and learning what impacts their health and contribute data for research on their prevailing conditions.

Likewise, DailyStrength ("DailyStrength: Online Support Groups and Forums," 2006), provides support groups for people facing problems such as breakups and divorce, depression, post-traumatic stress disorder (PTSD), bipolar disorder, anxiety and other ailments. In this system, patients can share their experiences and get feedback instantly. In addition, the users can view the type of support they want according to support groups by categories or even community groups.

Upwellbeing (2019) shows support for diabetic patients and provides all the details they need to cope with the ailment. Among the information they provide are understanding diabetes where the types of diabetes are explained, ways to manage diabetes through treatment and medication, coping with diabetes and also the various complications related to diabetes. In addition to what is anticipated, there are also dieting recipes and advice on suitable physical exercises given. Patients can have an in-depth discussion about their condition and get the desired feedback there and then. There are many self-care applications currently available in the application stores to enable users to monitor and control the amount and type of food they consume on a daily basis. For example, MyFitnessPal (2019) is one of the popular applications that users prefer to use when they are on diet programs to achieve their ideal weight goal. This application shows the user the number of calories he can consume in total in a day based on his BMI calculations. This application provides excellent guidelines for users, but they do not have access to any form of social support. If they have any sort of query about their food intake or the type of exercises they can do, they may not be able to approach anyone for advice. Likewise, there are other self-care applications that are aimed at empowering users to manage their own care independently.
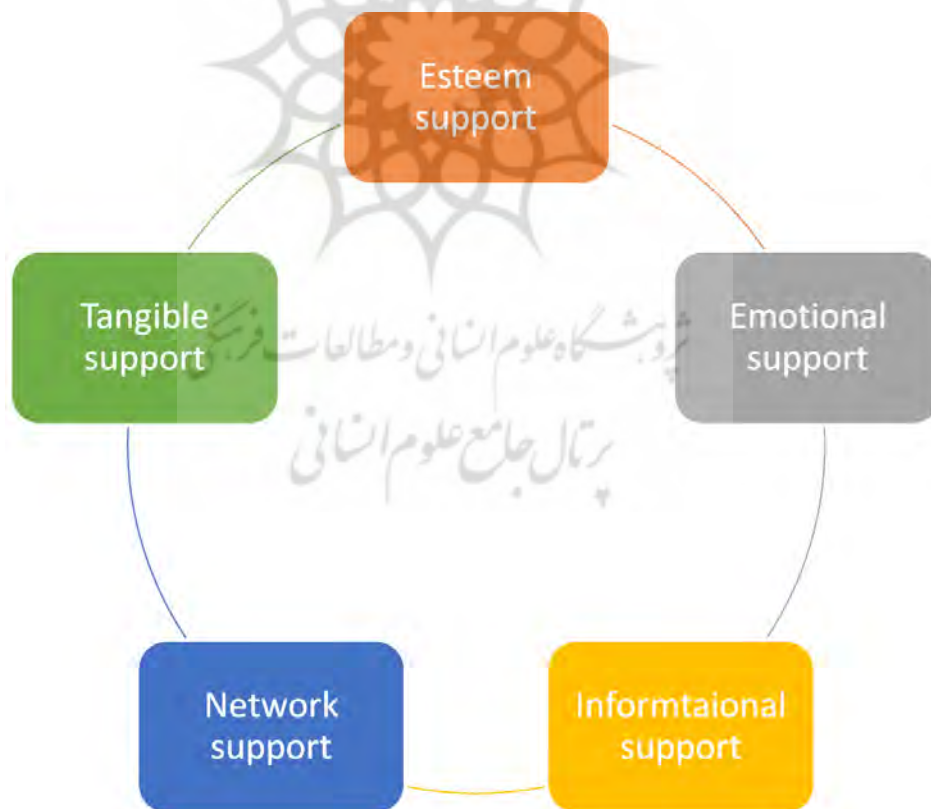
Figure 1. Types of social support in healthcare

**Table 1. Types of social support provided in Healthcare**

Type	Definition
Esteem support	This support refers to validating "the recipient's self-concept, importance, competence, and rights as a person and includes compliments, validation and relief from blame". In other words, it is the ability of a message to elevate the positive behavior of a person or to boost his self-esteem to make some progress in his life. For example, one's self esteem can be enhanced by instilling the belief that he can complete a task all by himself and do his very best without external support. Such an individual will eventually realize that he can do the task without anyone's help and this gives him great self-satisfaction and by this he would say "Yes, I knew I could do this!" or "That was easier than I thought it would be!".
Emotional support	This support is given through communication, love and care towards an individual. There are a few types of emotional support given via physical affection, encouragement, understanding, confidentiality, prayers and sympathy. Physical affection in this context refers to motivating a person to do what he wants to do with a pat on his back. Encouragement is to give someone an extra push to do something and motivates him to strive higher. On the other hand, understanding is to know the actual feelings of a person in that situation and helping him overcome his problem. For confidentiality, it is sort of an unofficial, non-disclosure agreement between two or more persons about a matter that is not supposed to be revealed without the knowledge of the person concerned. Prayers is a means of motivating one to head towards the spiritual path and helping him to focus better on what he wants to achieve without feeling left out. And lastly, sympathy means being considerate of how another person feels about a situation he is in and empathizing with him (Cronan et al., 1998).
Informational support	This support includes messages that give directions to execute a task, advice on how to do it, referrals to individuals who have expertise in their respective fields, situation evaluation and also teaching. Giving someone these types of information encourages him to carry out a task more confidently; without experiencing doubts about its outcome. He will be sure of a positive outcome because he will believe that what he does will have a positive outcome for sure, because it has been done, experienced and tested (Cronan et al., 1998).
Network support	This support works by creating a structural connection within a circle of people. It helps one to get introduced to people whom he has never met before but have gone through situations similar to the one he is facing at the moment. Connections with different people will make a person realize that what he is going through is not something new and there is a possible solution for it. One will also get to question the others in the group in coping or handling the situation in a better or different manner (Cronan et al., 1998).
Tangible support	This support involves a third person who provides physical help to the person who needs support. Besides this, a person getting involved directly in helping someone to get something done can show this support. For example, it is quite a hassle for an elderly person to carry heavy boxes up a flight of stairs. Tangible assistance here comes in the form of offering help to carry the boxes, to ease the burden of the elderly person (Cronan et al., 1998).

The objectives of this paper are twofold: (1) to review the role and importance of social support in health information systems, and (2) to investigate the perceptions of healthcare professionals and consumers towards incorporating social support in self-care applications. We try to answer the following research questions: (1) "what are the types of social support provided in healthcare and how it plays a role in health information systems?" and (2) "what are the perceptions of healthcare professionals and consumers towards social support provided through health information systems in the form of self-care applications?"

This paper is organized as follows: the following section presents a review of the role of social support in health information systems, the methodology employed in conducting the review, the results and discussion. Subsequently, a qualitative study on the perspectives of healthcare professionals and consumers is presented, in which details of the methodology, results and discussion are reported. Finally, the conclusion wraps up the findings and proposes future areas of study.

Materials and Methods

The Systematic Literature Review (SLR) method was employed in conducting the review. The SLR helps to build comprehensive strategy in searching for related studies (Siddaway, 2014). The following are the procedures on how the SLR was conducted. For this research, published papers were selected and retrieved from Springer, IEEE Xplore, ScienceDirect, Cambridge University Press, and John Wiley and Sons using a combination of terms as follows: [social support in healthcare OR role of social support in healthcare OR role of using health information systems OR health information systems OR social support in health information systems]. Figure 2 shows the SLR flow diagram of this study.
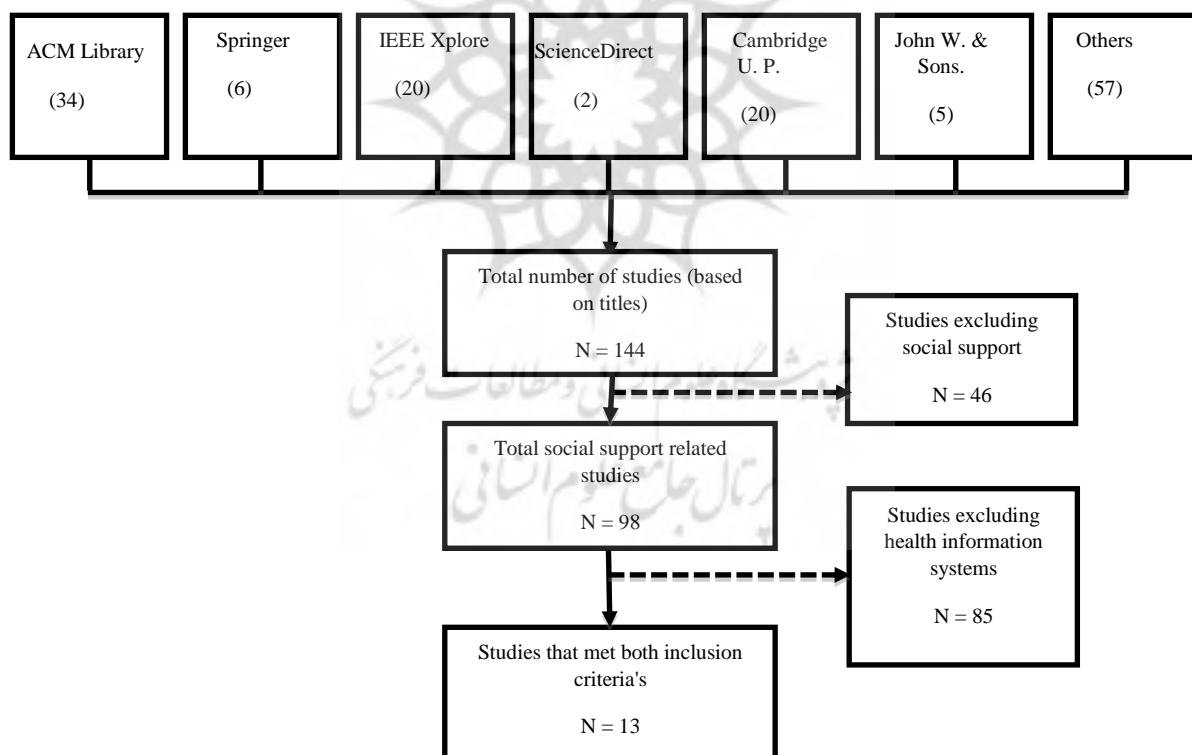
Figure 2. SLR Flow Diagram

The inclusion criteria for this research were: (1) social support related studies, and (2) health management system studies. The exclusion criteria were: (1) studies that were not about social support, and also (2) studies that were not about health information systems. In

total, there were 144 papers selected based on the headings; 34 papers were taken from ACM Library, six papers from Springer, 20 papers from IEEE Xplore, two papers from ScienceDirect, 20 papers from Cambridge University Press, five papers from John Wiley and Sons and 57 papers were obtained from other resources.

Reading through the abstracts of all the papers helped to effectively remove 46 papers, as they did not have any social support content in them. A further analysis of the remaining 98 papers, by looking through the whole of the articles resulted in the removal of another 85 papers. After the elimination process, 13 papers were finally selected for the review.

Results

The 13 papers that were selected based on the inclusion and exclusion criteria were reviewed individually and the results are presented below in Table 2. The table presents the type of application elaborated in each study, the social support provided, the method used to carry out the studies and the significant findings.

Healthcare-focused social networks are ideal solutions for individuals who are seeking social assistance, since they have a large user base of all age groups, backgrounds, and like-minded groups. Patient networks such as PatientsLikeMe enable individuals to self-manage their health conditions (e.g., depression, anxiety and stress disorder). An individual would find it easier to use the social network as a path to seek a certain type of social support he needs because he is familiar with the features in it. It is natural to feel more comfortable to be able to connect and share one's story with family members and close circle of friends whom he is open to talk to and are familiar with. However, based on the information we obtained from the reviewed papers; new health information systems should integrate the social component in the design of such systems in ensuring sustainable use of the system as well as to achieve the desired health outcomes.

Social support is crucial in health information systems, as it helps healthcare consumers, patients and older adults to better manage their health. Instead of focusing on social networks, explored here are other applications that provide social support. The 13 reviewed papers covered specific and distinctive applications and delivered different types of social support for people to use according to their specific needs. Out of the 13 papers, only three papers were conceptual papers and the rest were empirical studies, with outcomes derived from an empirical evaluation of an application.

On the whole, all the papers showed importance and relevance in providing positive changes in the lives of the users and letting them have more control to better manage their health conditions. Most of the papers were concerned about the social support provided for patients using mobile applications. The patients and the users of the health information systems via mobile applications had not been pre-taught to use the system, but they could use the systems with ease, as they were user-friendly. The empirical studies gave a clear picture

on how and when the users would feel comfortable in obtaining the social support they needed without any sort of confusion.

We have identified the types of social support provided in healthcare. This includes the five typical types of social support (esteem support, emotional support, informational support, network support, and tangible assistance (Adams et al., 2014)), as well as family/spousal support through the family members of the patients and peer support through the friends of the patients. Disability support is another type of key social support, which can be in the form of a helping hand especially for disabled elderly patients who need additional care, which is provided through a health information system.

It has been established that social support plays a critical role in health information systems. Users and patients feel the support and security provided by the social support system they use to manage their health. The social support provided helps in building confidence in the users, motivates them to make effective use of a healthcare solution and most importantly makes them feel that they are not alone in managing their care. Thus, instead of seeking social assistance from a different system or social network, it is ideal to integrate the social component in the health information system, which is designed to empower healthcare consumers to take better care of their health.

Table 2. A review of social support provided in health information systems

Author	Type of Application	Social Support Provided	Empirical Study?	Method	Significant Findings
Au-Yeung et al. (2010)	Networked wellness system	Behavioural support	No	After ingestion, an edible sensor (embedded in drug) is activated via stomach fluid and communicates to a wearable monitor that identifies the sensor as unique and records ingestion time/date	The study has shown a patient-centric yet highly scalable mobile care management solution. This system will be intended for wide clinical utility, for both acute and long-term application. The system will also be able to be customized for use in therapeutic areas, including cardiovascular, metabolic, neuropsychiatric, and infectious diseases.
Cronan et al. (1998)	Health care system	Social support for osteoarthritis	Yes	Survey of 130 male and 233 female members of the health maintenance organization	The study explained the inventions that were targeted appropriately with the use of a health care system which can be highly cost-effective without adversely affecting health status.

Ko, Wang and Xu (2013)	Blogs and online forums	Esteem support, emotional support, informational support, network support, tangible assistance	No	Analysis method - diary-like and informative blog posts	The study has discovered that the kinds of social support that are widely available and received by diary-like bloggers are justification, inspiration, and compliments. Besides that, this study showed that diary-like bloggers are most likely to post their day to day life conflicts, pressures, and despairs. Lastly the study concluded justification, praise and help as the main types of social support given by the viewers to A-list bloggers.
Koetsenruijter et al. (2016)	Health and welfare system	Emotional support, informational support, practical support	Yes	Written questionnaire, pre-structured face-to-face or interviews among 25 patients	The study provided evidence that strong social support may compensate for the adverse impact of low education, at least with respect to self-management capabilities of diabetes patients.
Lee et al. (2004)	Health care system	Emotional support, informational support, tangible support	Yes	Survey	The study revealed that improving the understanding of the pathways of health literacy would greatly enhance the ability of policymakers and health care providers to improve the delivery of care for patients with low health literacy. This is particularly in poor and underserved communities where the effects of low health literacy are most conspicuous.
Marzuki, Ariffin, Salleh and Rahaman (2014)	Mobile application	Social support	Yes	Quantitative survey approach among flood victims	The study showed that there are significant differences in impression management and gender via mobile application. It was found that gender did not play a role in the different ideas on well-being. It also showed the need for social support through the application to assist the people who are in need of social support, especially flood victims.
Singh and Nayak (2015)	Management system	Social support in general to handle the stress of police officials	Yes	650 questionnaires were distributed in 20 police stations of which 599	The study has shown the application of the psychological stress theory to explain the adverse effects of job stress on the job

				completed questionnaires were received	satisfaction of police officials in ethnically diverse developing countries like India. This study suggests several strategies for the police academy to help enhance job satisfaction among Indian police officials.
Sobnath et al. (2016)	Wearable sensing and smart cloud computing application	Social support in general	Yes	Pilot testing by giving participants the patient's4 applications pre-installed in it; multiple types of questionnaires	The study showed how social support is provided via mobile self-management application for Chronic Obstructive Pulmonary Disease (COPD) patients with comorbidities. It included patients who had diseases such as cardiovascular diseases or coronary heart failure, diabetes, osteoporosis, lung cancer and mental health problems like depression or anxiety. The application also showed that the prototype could be used easily by the elderly on a daily basis to complete their tasks with the convenience of staying at home. Patients described the application as being attractive and efficient and found themselves in control of the interaction.
Sultan and Mohan (2012)	Mobile collaborative disease management	Network / Peer support	Yes	Individual interviews and a focus group; the study was conducted using 21 users in the target group	The study aimed to gain an understanding of the user's perceptions of a remote peer-supported initiative called mobile DSMS. Suggestions were given on the aesthetic features and affordability of the application.
Weaver, Lemonde, Payman, and Goodman (2014)	Self-care application	Family/spousal support	Yes	Semi-structured interviews among 45 respondents from 502 patients	The study suggested the importance of social resources for dietary management. Moreover, it also showed the contribution of family support in managing the risk of diabetes and how to self-manage it.

Zhang, Norris, Gregg and Beckles (2007)	Self-care applications	Social support in general	Yes	The data from the Longitudinal study of aging (LSOA) was used together with information collected from interviews with 9447 civilians who were non-institutionalized persons aged 70 years and above.	This study observed the relationship between social support and fatality among the aged with diabetes and discovered that social support significantly affected mortality among these people. It also showed the importance of promoting the understanding of the role social support plays in diabetic survival. This in turn may have implications for public health and community-based interventions.
Jacobson (2013)	Impression management	Instrumental support, informational support, emotional support.	No	Literature review	The study explained the thoughts of flood victims towards social support given by the government. Moreover, this study was done to analyze the victims' well-being, social support and their impression of the government's attitude towards this matter.
Haffiza, Rahaman, Mustaffa and Ariffin (2014)	Health management system	Senior care, disability support	Yes	Quantitative survey	The study analyzed the types of health care services and also social support available for health care consumers, especially for the elderly. The requirements needed to practice as specialist were also reviewed. In addition, it gave suggestions on increasing focus on preventing illnesses, having more means-testing on healthcare, and having advance technology to help patients in decision- making.

Social Support in Self-care Application

Self-care applications are becoming popular among healthcare consumers. They are mostly designed to empower users to be more proactive in managing their health. In the previous section, we have established the importance and the role of social support in health information systems. In this section, we report an interview study that was conducted to determine the perception of healthcare professionals and consumers towards integrating social support in self-care applications.

Methodology

Semi-structured interviews were conducted with eight participants, who were divided into two groups: healthcare professionals and healthcare consumers. Each group comprised 4 participants. The participants were randomly selected. The healthcare professionals group consisted of three medical officers and a specialist who have a minimum two years of experience in this field. The healthcare consumers group consisted of two young adults who are healthy individuals and two older adults who are patients.

The interview sessions were held at different locations. The doctors were interviewed at a nearby hospital. The healthcare consumers were interviewed in their homes. Each interview session lasted for about forty-five minutes. An overview of the participants' demographic information is provided in Table 3. Table 4 lists the questions used in the interview with the participants.

Two sets of questions were prepared for each group of participants. Three experts (i.e., two academicians and one healthcare professional) reviewed those questions to ensure they were suitable for the interview sessions. However, as mentioned, we followed a semi-structured approach in conducting the interviews in enabling the participants to express their thoughts freely. Moreover, this method allowed us to gain better insights on how healthcare consumers and healthcare professionals perceive the idea of incorporating social support into novel self-care applications. Several themes were developed from the responses of the interviews. Content analysis method was employed in analyzing the data gathered (Vaismoradi, Turunen, & Bondas, 2013).

Table 3. Demographic data of the interview study participants

Group		Occupation	Age (Years)	Years of working experience
Healthcare Professionals		Medical Officer	27	3
		Medical Officer	29	2
		Specialist	35	9
		Medical Officer	31	4
Healthcare Consumer	Patients	Technical Assistant	58	37
		Housewife	57	20
	Healthy Individuals	Student	22	1
		Engineer	28	3

Table 4. Interview questions

Category	Questions
Healthcare Professionals	1. Have you heard about social support? If you have, what do you understand about social support?
	2. How important is social support in enabling one to manage his/her health?
	3. Do you think that social support is beneficial to one's health? What kind of benefit do you get?
	4. What is the role of social support in self-care?
	5. Have you heard about self-care applications?
	6. Have you used any self-care applications and what do you use the self-care applications for?
	7. What are some of the challenges you faced in using the application?
	8. How can we deliver social support via self-care applications?
	9. What do you think would happen if there is no social support provided to patients who are in need of them?
	10. What would you like to see in a self-care application?
	11. Do you think patients are using the social support available to them? If not, how do you think this situation should be improved to benefit the patients?
	12. Which is the best way to deliver social support? (via gadgets or devices; Skype, video conferences, instant messages)
	13. What sort of social support do you think should be provided in the self-care application?
	14. How comfortable are you in sharing your personal health information with others?
Healthcare Consumers	1. Have you heard about social support? If you have, what do you understand about social support?
	2. How important is social support in enabling one to manage his/her health?
	3. Do you think that social support is beneficial to one's health? What kind of benefit do you get?
	4. What is the role of social support in self-care?
	5. Have you heard about self-care applications?
	6. Have you used any self-care applications and what do you use the self-care applications for?
	7. What are some of the challenges you faced in using the application?
	8. How can we deliver social support via self-care applications?
	9. How open do you think your patients are in being approached to be assisted with social support?
	10. How do you think this situation should be improved to benefit the patients?
	11. Do you think patients are being exposed to social support that is available regardless of health management systems?
	12. Do you think it is acceptable to involve a third person such as your spouse, child or a peer in the process of seeking and accepting social support?

Discussion

The information derived from the interview sessions were divided into five themes – Importance and Lifestyle, Awareness and Education, Drive and Commitment, Attitude and Self-care Technologies. These themes were developed from the responses of the participants. In this section, we report the perceptions of both groups, i.e. the healthcare professionals and consumers.

Importance and Lifestyle

Most of the doctors agreed that social support should be provided to people who are in need of it. One of the doctors expressed: "*A patient who is in need of the social support, not only should be supported by his/her family members but the whole community. They have to support them in having a better life*". With social support, if a patient sees improvement and senses improvement, he is likely to feel more stable mentally, physically and emotionally. However, the four doctors agreed that patients who are in need of social support would face a huge amount of difficulty in doing their own work or chores. They would feel low about themselves and would not want to do anything. Some patients can even go into depression when they fail to be productive. Patients would experience more stress in addition to the existing stress caused by their medical condition.

Two healthcare consumers are of the view that social support enables one to experience positive changes within himself. Social support can go beyond improving lifestyles or ability to cope with challenges. It helps recipients build the right mindset to overcome obstacles they face in life. One health consumer expressed his view: Many people would be able to have control of their actions, their minds, their way of thinking and what they speak among a group of people when they have been approached by social support and gaining from it."

In conclusion, both groups of participants stressed the importance of social support in the life of an individual, especially one who has a need for it. In addition, social support lends confidence to an individual to live in a society of people and to feel accepted (Ko et al., 2013).

Awareness and Education

It is quite apparent that patients can be reluctant to seek social support even when they need it. One doctor explained that even though their patients were recommended suitable or appropriate social support, the latter were hesitant to take up the offer. Here the patients could be skeptical about the support living up to their expectations. Hence the situation arises whereby the patients are not open to the social support available and become egoistical and self-dependent in doing their work even though they face much difficulty. The doctors say that: "The patients should be proactive in seeking social support that they need for themselves or for their loved ones and they must be approachable for the doctors or other health professionals to give them a helping hand" Besides that, another doctor suggested that the

availability of social support should be informed to patients and healthcare consumers, probably through hospitals, social media, mass media and social apps that are widely used. However, hospitals primarily should be fast in seeking and providing patients with any sort of social support they need because the delay can jeopardize a patient's health and put his life at stake.

With regards to the perception of healthcare consumers, the doctors expressed that the older generation are less open to accepting the social support available to them. This is mainly because they are caught up with their culture and ego of living independently without hoping for aid from anyone, even their own family members. Three of the healthcare consumers feel that a patient's family members have to play the main role in encouraging patients to try the options given to them. They are the ones who have to stand by the patients as their support system. This will encourage the patients and ensure that they are not alone in coping with the challenging situations they are facing.

In brief, seven out of the eight participants claimed that there is less awareness about the availability of social support among healthcare consumers. A few of them felt that there are fewer talks, and discussion sessions organized by the government and non-government organizations. This has led to the public being uneducated about the importance and existence of social support (Lee et al., 2004).

Determination and Commitment
The doctors pointed out that the patients are the main targets in the process of getting well and gaining from the social support that is provided. They are the ones who have to be determined to accept the help given. Adding to that, patients have to believe in the social support provided and that can make positive changes in their lives. One of the doctors stressed that: "Whatever can be said and advised to the patients, at the end the only factor that matters is the patient's discipline in following the advises and instructions given to them. It will be useful to them because they will be able to feel more pumped up to help themselves in improving their health."

Furthermore, one of the health consumers admitted that there are patients who are not interested in the idea of approaching social support, the reason being that they have to be committed to what they have begun and that requires some sacrifice, not only from the patient but also his family members. They are the ones who have to be by the patient in making sure that he is not giving up and believing in what he is being helped for, which is to have a better life in the coming years. Another health consumer also mentioned that: "Patients nowadays are just not into this social support and not believing the outcome of it because it has not been known by many, whether the results are good or bad. It has also been a question of what would happen if a patient does not seek and accept the social support given to them and what will happen if they have accepted the offer."

It is evident that doctors and healthcare consumers share the same thought, that is, patients, disregarding the severity of their health conditions, have to be committed to the help that is given to them. They need to cultivate a strong trust in the assistance rendered and always hope for the best outcome (Reblin & Uchino, 2008).

Attitude

The doctors have mentioned a few times in the interview sessions that every patient whom they treat is different from the other. They vary from each other; they vary in attitude, character, behavior and understanding. One of the doctors asserted that: "Most patients who come in for cases that need help especially social support have difficulty in accepting their situation. This is called denial state where they have been not stable and straight to understand that they need help and it's okay to seek help." Another doctor also claimed that patients who come to the hospital should be able to endure painful news and attempt to cope with the help given.

Apart from that, one of the health consumers shared that: "I feel that the older generation goes through a tough phase in accepting the reality that is happening. They need to start appreciating their lives of how blessed they are to have all these facilities available for them." Besides that, another health consumer said that he has seen so many of his relatives who could have survived their health conditions if they had only accepted the help suggested by the hospital.

All the participants agreed that when patients' attitudes change there are better chances for social support to reach more people. Change cannot be forced onto a person; it has to happen naturally within the person in appreciating the value of the help given (Haffiza et al., 2014).

Self-care Technologies

All four doctors mentioned and supported the idea of having a self-care application based on social support for patients. They said that most of their patients have smart phones. However, it is doubtful whether the phones are used to the fullest. A doctor shared that: "There are patients who have smartphones and some who do not have one. Not all those who have smartphone have the knowledge of how to use the features in the phone. They prefer using the phone for their basic needs such as messaging, making and answering calls. The most technical they could be doing is using the WhatsApp application to do the same functions that they are familiar with via Internet." Another doctor felt that if there were a social support-based self-care application, patients would use it provided that the functionalities offered are user friendly and possibly equipped with voiceover technology. Moreover, as doctors, a few of them are not aware of the types of self-care applications that are available for use in normal healthcare. The doctors find that they are contended with their knowledge about the health industry and there is no need to use an application to monitor them. One of the doctors claimed that: "It would be nice to have the patient's family members involved in this process. They could be connected to the application and know what is the support that is being given

to the patient and help them." As for the doctors themselves, they feel comfortable in sharing their health information with their spouses and their close family members.

The health consumers felt that it is difficult for patients who are not computer literate to use health support applications. If the application's features are complicated the users might struggle to use them, giving rise to frustrations. A health consumer share that: "I feel most comfortable in sharing my health information, especially sensitive health matters like this to my wife and my children. I feel such because I feel much relieve that my loved ones know the truth regarding my health, and they will be aware of whatever I am going through. They would look out for me like I look out for them at all times." One of the health consumers said that she is a smartphone user, but she is not into using applications especially health related applications. The reason being that she is used to her normal routine of memorizing her medications and just following what her doctor advises her to do.

In brief, all the participants have mentioned that they would be open to use self-care applications that provide social support if they are easy-to-use and enable their family members to be aware of their health status. Most of them expect social support provided via video conferencing through the application. By using this feature, they can at least get direct feedback and be able to communicate with the doctor or their social support provider though they are connected virtually.

Conclusion

The current study explored different health information systems with a focus on the social support they provide. The findings suggest that social support has an important role to play in health information systems. Healthcare consumers should be provided with social assistance in the systems they use in managing their health and hence social support is a vital component to be incorporated in any novel health information system. Healthcare professionals and consumers have stressed the importance of leveraging social support for better management of health conditions. Both these groups find that any health information system would be successful if it integrates social aspects, which are usually overlooked in the design of novel applications. Health information systems are designed with a specific objective in mind, such as managing a disease. As such, the incorporation of a social component will result in better health outcomes. Hospitals and non-government organizations should play a vital role in creating awareness of the importance and the need for social support among patients and those who visit hospitals. Healthcare consumers should be proactive in seeking help when needed.

Limitation and Recommendations

Along the way when the study was conducted, there were a few shortcomings that cannot be controlled. Among the shortcomings were the sample sizes of our interviewees. Although our results portray the significance of our findings, the involvement of a greater number of

participants for the interview could allow us to obtain more information and analyze it thoroughly. Besides that, this is a perception-based study, where the results obtained were solely from the perceptions and opinions from the participants are subjective and unpredictable. This is unlike of having empirical results and predict the expected outcome from the beginning. Moreover, for future work, reviewing the variables or constructs that are usually influenced by dimensions of social support in healthcare could also add knowledge for healthcare developers and consumers.

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