RESEARCH PAPER

A Patient Technology Acceptance Model (PTAM) for Adoption of Telehealth

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Abstract

Population aging is a global phenomenon, with the proportion of the population over the age of 60 increasingly rapidly. It is essential to gain an understanding of the factors that influence acceptance of technologies when they are introduced as part of the monitoring and management of clinical conditions. This study undertakes semi-structured interviews of elderly patients being monitored for Chronic Obstructive Pulmonary Disease (COPD), Congestive Heart Failure (CHF) or diabetes to determine the factors they deemed most important for acceptance of the technology. 18 women and 12 men with age range 65–90 and mean 77 years were interviewed. Nine main themes emerged; attitude to aging and illness, coping strategy, relationship and support, patient-doctor interaction, incorporating patients, self-efficacy, personality, personal meaning, and knowledge. The themes were grouped to three constructs; age/illness, patient, and healthcare practitioner, that were considered as the basis of a framework for a patient technology acceptance model (PTAM).

Keywords: technology acceptance, patient technology acceptance model, PTAM, elderly, telehealth

1. Introduction

Population aging is a global phenomenon, with the proportion of the population over the age of 60 increasingly rapidly. There has been a growing use of technology that is used by patients to monitor and manage their diseases. Despite some excellent results from use of the technology [1], it is essential to gain understanding of the factors that influence acceptance of these technologies when they are introduced as part of the monitoring and management of their clinical condition.

1.1. Health behaviours: acceptance of new technology

Health behaviours have been defined as any activity undertaken by a person for the purpose of preventing disease or detecting it at an asymptomatic stage [2, 3].

However this definition excludes activities that might be carried out by a patient directed at self-management, delaying deterioration, or improving general well-being, and the definition should be extended to include health behaviour as 'overt behaviour patterns, actions and habits that relate to health maintenance, to health restoration and to health improvement' [4]. This would include medical procedures or routines for conditions (e.g. diabetic, heart and hypertensive), service usage (flu shots, routine doctor's visit), and self-management (diet, exercise).

Health behaviours might also include behaviour modification towards smoking, drinking, sexual behaviour, and exercise [5, 6], which have been shown to have an effect on mortality and morbidity [7].

The requirement is to predict and understand who will accept and perform health behaviours. Various theories have been employed to explain health behaviour and health outcomes. This includes theories that investigate the adoption of health technologies to provide insight into the variation in behaviour including the Health Belief Model (HBM), Social Cognitive Theory (SCT), Stages of change (Transtheoretical Model), Self Determination Theory (SDT), Theory of Reasoned Action (TRA), and Theory of Planned Behaviour (TPB) [8]. Social psychology theories such as motivational theories and social cognitive theories have also been investigated. However, most IT and health research has employed intention-based theories to predict and explain human health behaviour towards adoption and continuance in use of health technologies and focuses on the recognition of the factors that determine intention such as attitude, facilitating conditions, and social factors.

The most commonly applied intention based models are TAM, TRA and TPB (an extended version of TRA), with TAM being used to explain acceptance, and TRA and TPB to explain continuance. However, TAM, TRA and TPB may not provide the best theoretical foundation for the study of adoption and continuance of use of IT by patients due to differences in the factors that contribute to health behaviours including social factors, emotional factors, personality factors and cognitive factors [9, 10]. In addition, factors such as age, gender, knowledge level, beliefs, socioeconomic, and ethnic values, play a role in the adoption of health behaviours.

Nonetheless, TPB is used extensively to understand the determinants of IT adoption and usage. Previous studies have increased the explanatory power of TPB by considering the multi-dimensionality of its components; thus, the extended TPB has been used successfully in predicting IT usage by decomposing attitudinal, normative, and control beliefs [11–13]. A large range of variables from different models has been associated with the acceptance of health behaviours [14–16].

This research considers variables from the different behaviour models to determine which theories adequately explain the behaviours observed in this study
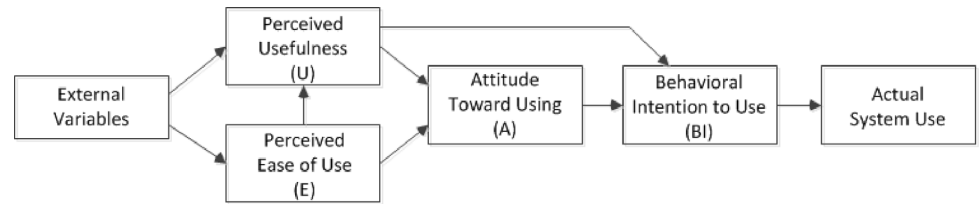
Figure 1. Technology acceptance model (TAM) [18, 19].

and thus if they can be used within a framework developed for this study, which will provide insights factors that significantly influence the intention to adopt and to continue using health technologies. This section explains why existing theories are inappropriate for this study.

1.2. Technology acceptance model (TAM)

TAM (figure 1) intends to explain the attitude behind the intention to adopt, accept and use a specific technology or service [17]. TAM theorizes that an individual behavioural intention to use a system is determined by two beliefs: perceived usefulness and perceived ease of use [18].

Perceived usefulness is defined here as "the degree to which a person believes that using a particular system would enhance job performance". A system with perceived high usefulness is, in turn, one for which a user believes there exists a positive use-performance relationship [19].

Perceived ease of use, in contrast, refers to "the degree to which a person believes that using a particular system would be free of effort". All else being equal an application that is perceived to be easier to use than another is more likely to be accepted by users [19]. However, perceived usefulness is influenced by perceived ease of use because, other things being equal, the easier a system is to use, the more useful it may be perceived to be [18]. Moreover, if a system is perceived to provide significant benefit (high perceived usefulness), then users will accept the learning involved (moderate ease of use) to adopt a new system commensurate with the benefit perceived. TAM remains the dominant model for predicting user acceptance [18].

1.3. Application of TAM

Advantages

1. TAM is a valid and robust model that has been widely used and potentially has wider applicability
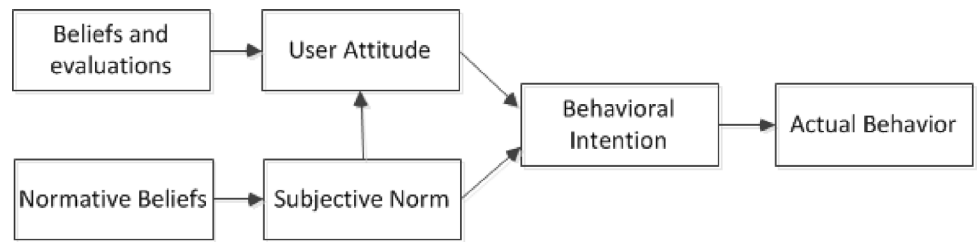
Figure 2. Theory of reasoned action (TRA) [21].

2. The TAM measures of perceived usefulness and perceived ease of user are highly reliable and may be used in a variety of contexts
3. The sample sizes required for significance are modest.

Limitations

The fundamental constructs of perceived usefulness and perceived ease of use that are the basis of TAM have been considered not to reflect fully the influences of usage-context factors that may determine user acceptance in specific situations [20]. TAM determines outcome of acceptance based on the perception of the technological aspects of the system by the users, and is most often applied in situations where the decision to deploy is outside the control of the user. TAM does not include consideration of how social, physiological and psychological factors may affect acceptance in specific situations and so TAM has not been considered within this study.

1.4. Theory of reasoned action (TRA) and theory of planned behaviour (TPB)

The limitations of TAM have led to new theories being developed that are intended to indicate how attitude influences behaviour. TRA is one approach that includes the behaviour of people in order to understand and predict intention [21]. TRA assumes that behaviour follows reasonably from belief, attitude and intention; people choose what they accept and what they ignore based on the implication of that behaviour or activity.

TRA (figure 2) was developed to identify and predict behaviour and thus attitude, and assumes that humans are logical and make methodological use of the information accessible to them. However, TRA is limited because it assumes that actions are under volitional control, but this fails to acknowledge that human behaviour can be directed for example, by constraints. TPB [22, 23] therefore includes the variable "perceived behavioural control", to overcome this limitation in TRA [21].
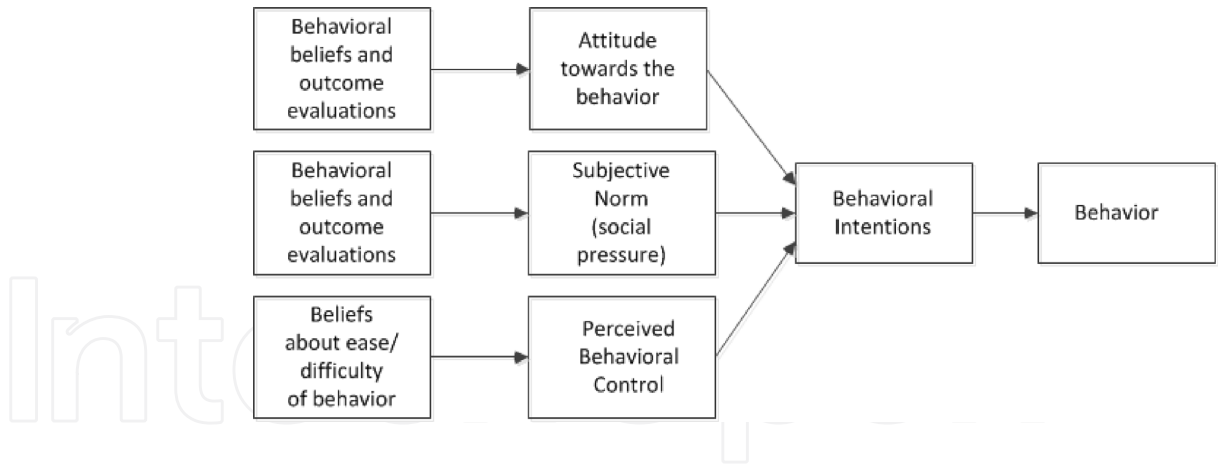
Figure 3. Theory of planned behaviour (TRB) [22].

TPB (figure 3) is a well-established model in social psychology to predict human behaviour and intention in situations where individuals might lack control over their own behaviour and was conceived from self-efficacy theory [24]. TPB predicts that the stronger the Perceived Behavioural Control (PBC), the more likely the individual will perform the behaviour. The PCB in TPB directly affects the intention to perform behaviour, and may directly affect behaviour in situations where the user intends to perform the behaviour, but is prevented from doing so [22]. PBC relates to the extent to which the person believes that they have control over personal or external factors that may facilitate or constrain the behavioural performance [23]. It is assumed to have direct effect on both behavioural intention and behaviour [25].

There are three independent determinants of intention in the Theory of Planned Behaviour:

- Attitude—the degree to which the person is willing or prefers to perform the behaviour in question. Studies on the theories of reasoned action and planned behaviour have established that attitude is a reliable predictor of intentions and behaviour [26].
- Subjective norm—the perceived social pressure present to influence performing the behaviour or not. Within the variables of the TPB model, subjective norms are considered to be the weakest component, with a norm-intention correlation of 0.34, compared to 0.49 for attitude to predict behavioural intentions [27].
- Perceived behavioural control (PBC)—the degree to which a person is in control of their actions and is assumed to reflect past experience. This predictor is the major difference between TRA and TRB [26]. In addition to attitude and subjective norm influencing behaviour, the greater the PCB, the stronger should be the intention of an individual to perform the behaviour. However the difficulties in quantifying PBC have created uncertainties in its use, as the

magnitude of the PBC-intention relationship is dependent upon the type of behaviour and the nature of the situation [28, 29]. Moreover, PBC has been found in some situations to have no or limited effect on intention or behaviour [30].

TPB focuses on intentions as a locus of control and therefore allows investigation of variables related to intentions. It is therefore suited to study health-related behaviour [31], although outcomes have had mixed results. Whilst behavioural control has been found to have significant contribution in predicting intention compared to attitude and subjective norm in some studies [28], other studies have found that behavioural control was not significant [32, 33].

Advantages

- Currently very popular in IS research
- Has had a number of recorded successes
- Has been used to predict various behaviours

Limitations

TRB is built on the assumption that people are rational and make systematic use of the information available to them, which is usually not the case. The assumption that people consider the implication of their actions before they decide to participate or not participate in certain behaviours is also not likely to be the case with patients. It is also the case that people act on the opinions of others, long held beliefs, and do not consider the implications.

2. Method

2.1. Setting

Chorleywood Health Centre provides general practice in an area to the North-West of London. It has around 6000 patients, with an age profile older than the national average. This study was conducted within two projects, InCASA and REACTION. InCASA investigated monitoring frail elderly with chronic disease in their home for health and activities of daily living; REACTION investigated support for improved long-term management of diabetes.

2.2. Participation

Patients were selected using the inclusion criteria:

- Participant in project InCASA or REACTION
- 60 or older
- Able to speak English
- Diagnosed with COPD, CHF or Diabetes
- Registered with Chorleywood Health Centre.

Fifty two (52) patients were identified as meeting the criteria for inclusion. Each patient was given an information sheet on the study. Thirty (30) consented to participate. Each patient was provided instructions on use of the devices they would use to monitor their condition and then provided with devices and a monitor hub to take home and use for a period of 10-12 weeks. Information was given on how to gain assistance and in rare instances a visit to the home was made to resolve technical issues.

Patients were instructed to take measurements each day; blood pressure and weight for CHF, blood pressure and blood glucose for diabetes (before breakfast for fasting glucose), and SpO_2 for COPD. Taking measurements should take no longer than 5 min a day to complete. All information was transmitted automatically to the health centre using the hub provided and used by the clinician to monitor and manage the condition of the patient.

At the end of the monitoring period, each patient was invited to an interview that was designed to capture lived experiences of how they had managed or coped with aging, illness, preconceptions, and beliefs, and how these had affected their use and adoption of the telehealth given to them.

2.3. Participants

Participants were a purposive sample of 18 women and 12 men who had participated in either the InCASA or REACTION projects. Each patient had a diagnosis of at least one chronic disease of diabetes, CHF or COPD. All participants were elderly; with an age range of 65–90, and mean age of 77. The majority of the participants were retired, 2 being small business owners and 1 still teaching at a university. 60 per cent (60%) were married; average time of diagnosis was 24 months. CHF, COPD and diabetes were chosen due to their high prevalence in the population [34].

Interviews lasted 60–80 min, during which each participant was asked to respond to the following main questions:

1. What is your experience with aging and living with this condition?
2. How would you describe living with this disease and aging?
3. How do disease and aging affect each other? What feelings come to mind?
4. What is your experience with telehealth?
5. What impact did telehealth have in your life and to your condition?
6. Does your condition (aging and/or disease) affect your life and in what way(s)?

2.4. Research design

The study adopted Interpretative Phenomenological Analysis (IPA) to collect and analyse data. In IPA, the researcher puts aside past knowledge and experience in

order to be able to understand a phenomenon at a deeper and original level and does not apply any existing theories [35, 36]. It is an approach that seeks to explore, describe, and analyse the meaning of the lived experience of the individual: "how they perceive it, describe it, feel about it, judge it, remember it, make sense of it, and talk about it with others" [37]. IPA brings a sense of 'newness' or 'rawness' that allows descriptive and rich data to be obtained [35, 38]. Successful phenomenological research is determined by the extent to which the questions touch on the lived experience of the participant, and experiences are identified, rather than confirming theoretical explanation or interpretation [35, 39, 40].

2.5. Data analysis

In-depth interviews were used to collect data from the participants. The interview attempts to return the participant to the experience in order to obtain significant and detailed description that provides the basis for a reflective structural analysis, which portrays the essence of the experience [38].

The phenomenological approach was adopted to analyse the interviews [35, 39]. In this method, interviews are audio recorded and transcribed in full to an electronic document, which is analysed using the inductive and deductive coding technique. In inductive or open coding, significant phrases or sentences that are directly connected to the lived experience of aging, illness or telehealth are identified. The significant phrases are then formulated into meanings and categorized into themes and sub-themes. The resulting themes and sub-themes are then combined into a comprehensive and exhaustive description of the phenomenon. In this study, to assure the quality of the themes, a follow up phone interview or face-to-face interview was held with patients to discuss and validate the findings. If new data emerged, these were also included.

3. *Results*

From 58 verbatim transcripts, significant statements were obtained from the interviews and formulated meanings derived. An example of this process is shown in table 1:

Statements were also made on the hurdles encountered in adopting new technology and can be given formulated meaning:

- Physical challenges to using technology: e.g. health issues of the disease (e.g. diabetes) that can affect vision and make reading difficult.
- Sceptical attitude about the benefit of technology.
- Difficulties in learning to use new technology.

Table 1. Significant statements and formulated meaning.

Significant statement	Formulated meaning	Illness and age
At first I was afraid and I did not understand everything the doctor was telling me. It was so unexpected and all the new things I had to learn were ridiculous.	Having an incurable illness can be traumatizing sometimes, especially because of the new information and change you would have to make to include the new changes into your life and try to live with it, but it is more difficult to absorb all the information at an older age.	Diabetes, 77
(COPD) has no cure. It only gets worse, especially at my age. You just have to keep fighting the battle each day. I just enjoy my life the best way I can.	(COPD) is a dangerous illness that requires attention, especially at an older age, when the risk of rapid deterioration is very high.	COPD, 72
I see people losing their legs and arms because of this illness. I have seen my friends go through it. When you are older, they say it is worse, but I try my best to keep it from going that far. I would not give up.	The mental picture of diabetes puts fear in some people so that they might sometimes feel discouraged.	Diabetes, 65
They say you can reverse it sometimes with diet and exercise, but at my age I am not too sure. However the fact that it can be reversed makes me motivated.	The type of motivation available to a person can inspire or dissuade them to take action in response to their situation but sometimes they can be discouraged by their age	Diabetes, 62

3.1. Themes

Nine (9) themes emerged from the analysis of the data:

Theme 1: attitude to aging and illness:

Attitudes can be understood as a complex construct demonstrating a psychological tendency that is expressed by evaluating a particular entity, object or experience

with some degree of favour or disfavour [41, 42]. Focusing on the negative consequence of their disease and aging was the focus of the majority of the participants. They were less likely to recognize or appreciate the many positive experiences that could occur in later life such as increased experience and wisdom.

Theme 2: coping strategy:

The way adults perceive and evaluate their own aging and illness can be related to the range of coping strategies [43]. Coping is anything a person does to reduce the impact of a perceived or actual stressor (such as illness and aging). Some of the patients interviewed has also been diagnosed with major depressive disorder at some point in their journey due to self-blame and guilt, or blaming oneself for failure.

Theme 3: relationship and support:

There is evidence that support is effective in reducing anxiety during times of stress [44]. In contrast, lack of support during times of anxiety can in itself become stressful, particularly for people with high needs for social support but insufficient opportunities to obtain it, for example the elderly and children [45].

Theme 4: patient-doctor interaction:

This is a very significant notion. All but five participants mentioned the benefit of the portal or hub, which transmits the readings to the doctor. The patients found it very useful, as they did not have to visit the clinic to have readings taken. Also, they could participate in the review of their readings, which was instructive and very exciting to them.

Theme 5: incorporating patients:

Although it is clear that doctors have, in most cases, final responsibility for decisions of treatment and care in the health services, it is important that the patient feels involved as much as possible. Patients are usually satisfied with the technical quality of care they receive, but somewhere in the process, their individuality and involvement is lost and their personal and subjective needs remain unmet [46]. The majority of the participants emphasised that the feeling of being wanted, needed, and involved, made aging and coping with their illness less difficult and that telehealth provided them with this.

Theme 6: self-efficacy:

Personal efficacy is concerned with the beliefs of an individual in their capability to exercise control over challenging demands and their own functioning [47]. Most of the participants indicated that the main reason they had decided to participate in the study and accept telehealth was because it symbolizes control.

Theme 7: personality:

A pessimistic style affects how people view the world and how they view the world affects everything around them. People who have this hopeless and helpless view see positive events as extrinsic and random; and negative life events as global, internal and permanent [48]. People who are pessimistic are less likely to adopt change or hope that, for example, a health tool can keep them away from the hospital. Participants' view of their condition was one of the themes developed.

Theme 8: personal meaning:

Any trauma can be survived as long as some meaning can be found in the situation [49, 50]. Some of the participants highlighted that their faith had helped them cope with their situation.

Theme 9: knowledge:

Knowledge not only comes from external sources such as mass media, television, expertise, and journals but also from the healthcare service providers. Some participants acknowledged that they had read about telehealth, but when they were presented with the telehealth kit and given a demonstration of its use by the nurse, even though they had never used it, it felt familiar to them.

3.2. Framework

This study develops a framework to explain acceptance of technology by elderly patients. The Patient Technology Acceptance Model (PTAM) was developed from the themes that were identified during analysis of the patient interviews. PTAM identifies that acceptance of technology by patients largely depends on age (real and perceived) and the illness from which they suffer. The two constructs directly interact and affect each other; the age of a person can have an effect on their health and the illness of a person can affect how well they "age", the age they perceive for themselves, and how they manage the changes that come with aging.

Age and illness not only interact with each other, but can influence the behaviours of the patient, and the relationship between the patient and the doctors and healthcare service providers.

PTAM (figure 4) includes the patient construct that contains the six themes derived from analysis of the interviews that identify the areas in the life of a patient over which the patient has influence to accept or reject the technology or any assistance that is provided to help with their illness. The patient construct interacts with the healthcare practitioner construct as shown in figure 4.

The healthcare professional construct in PTAM shows the areas in which the doctor can influence the acceptance of technology by the patient. Both the doctor and patient constructs are influenced by age and illness, as depicted in the PTAM
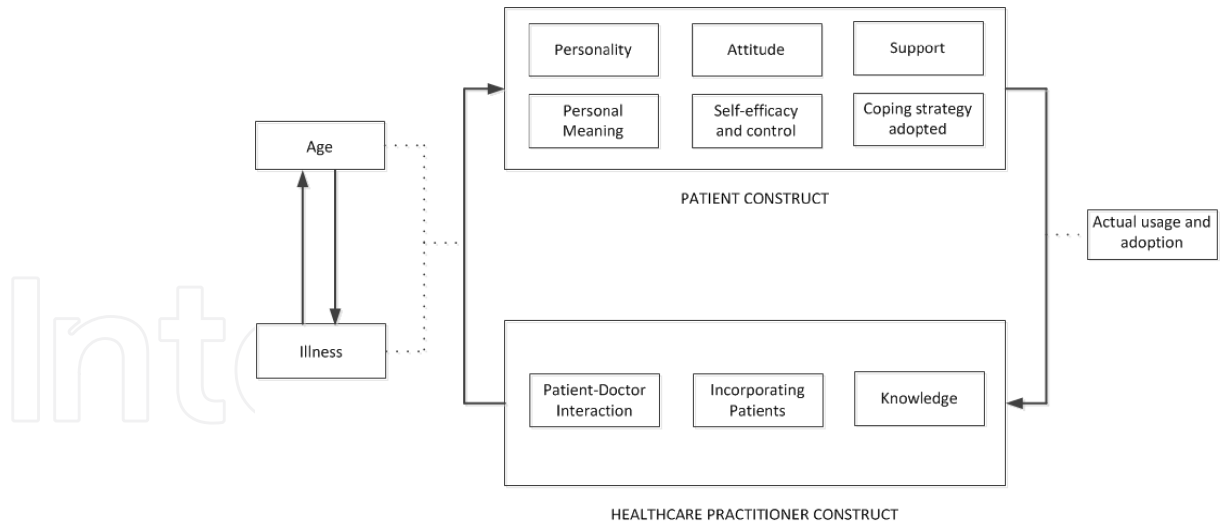
Figure 4. Patient technology acceptance model (PTAM).

model. This would indicate that the doctor must consider the age and illness and not just the disease of a patient when considering whether and how the patient will accept the technology. The approach taken by the doctor when introducing the technology has a significant impact on: the attitude the patient adopts; the personality the patient exhibits; the support the patient might need; the personal meaning of the experience to the patient; the self-efficacy and control of the patient; and the coping strategy employed by the patient.

The most effective way for the patient to accept and use the technology is by: providing patient-centred care (the patient being at the centre of any decision made concerning their health); encouraging consistent patient-doctor interaction or communication; incorporating the patients into their own health decisions; and making sure the patient is knowledgeable about the technology or service being provided.

4. Discussion

With people living longer, there is an increased urgency to identify the factors that may influence their health, autonomy and well-being in later years.

The consequence of the rapid increase of the elderly population in the developed nations is often viewed as the major problem of the 21st century and presents a major challenge for the world [51]. Better management of people living with long-term conditions and the elderly has been a key priority of the NHS. It is understood that if people living with long-term conditions are managed effectively in the community, they would be able to enjoy a quality of life free from frequent crises and any increase in hospital visits. Nevertheless, relatively little information

exists on what constitutes the best practice to provide this in terms of meeting the needs of the patient in the most efficient and effective way possible [51]. Any attempt to meet the increasing need and assure the best quality of life of the elderly and people living with illness must be based firmly on knowledge of the elderly and their resources and abilities, as well as their difficulties [49].

Understanding the lived experience of people in this situation is one way to gather knowledge not only of their ability or their difficulties with their condition (illness and aging) but also how it affects their acceptance or adoption of the efforts made to manage their condition. One of the efforts made by the NHS to assure the best quality of life of the elderly and people living with long-term condition is the use of telehealth and tele-monitoring [52, 53]. This study has examined the lived experience of the elderly living with long-term conditions. It has sought a thorough understanding of age, health and illness and how these affect acceptance and adoption behaviour. The study took as exemplar the use of telehealth that was being used to detect deterioration and is one of the few attempts to understand patient acceptance and adoption behaviour and how this behaviour may be explained through the use of their lived experience.

Nine themes were identified, which are the factors, or entities that influence the acceptance behaviour or adoption of telehealth in the lives of the older persons living with chronic conditions. The themes ranged from the personal belief of aging and the illness to the attitudes of accepting those beliefs. The findings are summarized in this section according to the themes and discussed in order of impact on the decision to accept the technology.

4.1. Attitude

Attitudes can be sub-divided into beliefs, feelings and behaviour. This sub-division provides a better understanding of the nature of the attitude of the participant and how this relates to other variables and outcomes.

Most of the patients focused mainly on the negative aspects of aging and their illness. However some, especially the diabetic patients, hoped that the tool would enable them to reverse the disease. Participants who evaluated their illness or aging as negative expressed a lack of control, predictability and safety about their future. They also could not look beyond the presence of the disease in their life, or make peace with aging; and were unable to appreciate the positivity life could present and were therefore least likely to favour the use of the telehealth. Those who felt there was a light at the end of the tunnel in terms of hope to reverse the disease or avoid deterioration were happy with the telehealth and were more likely to use it again in the future.

4.2. Coping strategy

The coping strategy employed by an individual depends on a number of factors including: their emotional and psychological states; their financial circumstances; the severity of the illnesses or problems; and the support and healthcare available [54]. Most, if not all of the participants, felt a sense of defeat when they were diagnosed with their disease. They felt it was going to be more difficult to manage, especially at their age. For some this situation was stressful and they coped by drowning themselves in self-blame, denial and guilt, so the presence and effect of telehealth was nullified and not used to its full potential. Others who decided to take responsibility for their illness and refused to see aging as a limitation were able to see telehealth as useful and extraordinary, and would recommend it to friends and family.

4.3. Support and relationship

Social isolation is a risk and has been associated with poorer survival and reduced quality of life among an older population. Support and relationship were very important for the majority of the participants and proved to be very beneficial as it influenced their acceptance and adoption of telehealth. Many sought help and support from their families regarding the set-up of the tool; families also provided reminders to take measurements. For those that did not have family around them, this was somehow not an issue for them as they had learnt to cope and be independent over time, as dependence is also formed over time, especially with the presence of help, either from family or social support.

4.4. Patient-doctor interaction

Patients are usually worried about how their disease or treatment might affect their lives. They also want to be informed about and involved in the medical decisions that might affect their lives [55]. Interaction with their doctor was very important for all the participants as it paved the way for them to express their concerns about their health to the doctor. The majority stated that one of the reasons they had accepted telehealth, was because they felt their hands were being held by their doctor and it gave them a sense of confidence in using the tool. Nevertheless the tool did raise concerns, as some of the patients were worried that in future, technology might be used to replace the face-to-face communication with their doctor, and for some this was a significant concern.

4.5. Incorporating patients

Healthcare providers can view patients solely as a source of income for their institution, and not as educated consumers with preferences to express and choices

to make [55]. Consequently, the patient perspectives may not be considered when deciding if, when, and how to introduce telehealth into a healthcare environment. This can become the main reason for failure and lack of adoption of these technologies.

Patient-centred care, an approach that specifically adopts the perspective of the patient [55] is an emerging methodology in healthcare. Most of the patients in this study expressed gratitude regarding the use of telehealth, as it empowered them by making them feel active and needed in their own care. The tool increased their motivation and encouraged them to take steps that would benefit their health and well-being [56]. All but two of the participants felt that telehealth gave them a sense of being needed and fully in control of their health, which in turn resulted in continual use of the tool.

4.6. Self-efficacy

It has been suggested that older adults might be particularly vulnerable to the negative consequence of low levels of perceived control [57]. This was observed in this study, as participants with a high level of perceived control found telehealth useful and this resulted in continual use. They appreciated being able to track their progress through their readings and could see the benefit or consequence of their actions (diet, exercise). However, those with a low level of perceived control and who opted out of taking responsibility for their health relied heavily on the doctor and did not make proper use of the telehealth.

4.7. Personality

Optimism was very evident from those who enjoyed and found the telehealth useful. Optimism was more prevalent in the diabetic participants, as they felt they could reverse the illness through diet, exercise and continual monitoring of their progress using the telehealth. The COPD participants were more pessimistic, as some felt nothing could be done to change the disease and would rather enjoy the time they had. This was demonstrated in their interaction with the technology and interaction with the interviewer.

4.8. Personal meaning

Life and situations or challenges mean different things to different people. Understanding the meaning of a situation for a person can give insight into the ways in which to approach that person; what they will accept and what they will not accept. Some participants turned to their faith for comfort and made peace with their conditions and focused on the deep value outside the world as others ordinarily experience it.

4.9. Knowledge

For the majority of the participants, information and awareness about their health and aging played a large role in the acceptance and adoption of telehealth. Awareness and information created curiosity, and experience created familiarity for this group. Some had heard about the telehealth from the doctors, as it had been previously recommended and explained, therefore they were eager to use it. Some had used telehealth before and were willing to use it again.

5. Limitations

The main limitation for this study is that the findings are based on a single-study design; it is based on the views of a limited set of patients from one telehealth service in one area. In addition, the study was carried out in a relatively affluent area to the North-West of London and results may differ from inner city or rural locations. Also patients were mainly white Caucasian and results might differ with patients with a background from other cultures and customs (societies and ethnic groups). Therefore caution is required in generalizing the results from this study to other groups, populations or countries. In addition, not all participants were available to confirm their findings for the final review of the results.

6. Conclusion

Telehealth was used as a means to explore the lived experiences of patients from aging and living with chronic disease. With people living longer, there is an increased urgency to identify the factors likely to influence health, autonomy and well-being. This study will add to the body of research on health and psychology, and also educate healthcare practitioners and health innovators on the experiences of patients with technology, which in turn can enable them to provide quality care. The lived experience of the patients was explored without a pre-existing framework in accordance with the Phenomenological Approach.

The Phenomenological Approach has revealed that psychological factors are the most important that influence acceptance of technology by elderly patients. It further identifies that intention may be based on illogical decisions, typically determined from personality, long-held beliefs, social factors, and experiences, and influenced by age and illness. This differs from the premises of TAM, TRA and TRB, which assume logical decision processes, and thus are not adopted in this study.

The Health Belief Model identifies the constructs of; risk susceptibility, risk severity, benefits to action, barriers to action, self-efficacy, and cues to action [58]. These constructs accord with the constructs identified in this study. However in this study the constructs have been extended to include the influence of age and illness, and the relationship with the healthcare practitioner.

This study shows that healthcare providers and decision makers who are responsible for the innovation and implementation of health technology should make efforts to understand the patient and consider the conditions that influence the decision to accept, adopt or reject health technologies. This study highlights that healthcare providers and decision makers should adhere to the patient-centred approach presented in the PTAM model, as it could facilitate greater success in health technology based services.

Data availability

Data is not available due to patient confidentiality issues.

Conflict of interest

There are no conflicts of interest.

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