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Research Article

Navigating Innovation: Qualitative Insights on Using Technology for Health Education in Acute Coronary Syndrome Patients

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Abstract

Background/Aim:

Acute Coronary Syndrome (ACS) remains a significant cause of morbidity and mortality worldwide. Cardiovascular disease (CVD) prevention remains crucial despite advancements in clinical outcomes. Empowering patients with self-care skills is essential for managing ACS, and digital tools can enhance these practices. This study qualitatively evaluates patients' experiences with post-ACS digital tools to improve self-care.

Material and methods:

A qualitative phenomenological approach was employed, utilizing in-depth interviews with patients diagnosed with ACS enrolled in a telephonic follow-up program. Sampling continued until saturation was reached. Data collection included patients' perceptions of the accessibility and utility of digital tools in enhancing self-care knowledge. A descriptive analysis of age and gender was conducted to analyze potential demographic influences.

Results:

Ninety patients participated, with males predominating (70%) and a mean age of 69.2 years. Patients reported positive engagement with both educational videos and health blogs. Preferences varied, with 54% favoring videos and 36% preferring blogs. Difficulties in accessing digital tools were observed, especially among elderly patients. However, patients emphasized the instrumental role of these tools in complementing knowledge and facilitating self-care, while recognizing the irreplaceable value of direct interaction with healthcare professionals.

Conclusions:

Future interventions should focus on improving digital tools accessibility and effectively integrating them into patient care pathways to optimize self-care outcomes.

Keywords: acute coronary syndrome, digital tools, self-care, patient experience, qualitative research

Introduction

Acute coronary syndrome (ACS) occurs due to the erosion or rupture of an atherosclerotic plaque, which leads to the formation of an intracoronary thrombus, causing unstable angina, acute myocardial infarction, or sudden death, all of which are encompassed by ACS. [1] The term acute myocardial infarction (AMI) should be used when there is evidence of myocardial injury (defined as elevated cardiac troponins

above the 99th percentile of the upper reference limit), with the presence of necrosis in a clinical context consistent with myocardial ischemia.[1] To immediately initiate treatment strategies, such as reperfusion, patients with persistent chest pain or other symptoms indicative of ischemia and ST-segment elevation in at least 2 contiguous leads are usually designated as ST-segment elevation myocardial infarction (STEMI) patients. In contrast, if there is no ST-segment elevation, they are designated as non-ST-segment elevation myocardial infarction (NSTEMI) patients. [2]

Globally, coronary artery disease is the most common cause of death, and its frequency is increasing. In Europe, however, there has been a general trend towards a reduction in mortality from coronary artery disease over the past three decades. Coronary artery disease causes nearly 1.8 million deaths annually, accounting for 20% of all deaths in Europe, with significant variations between countries. [2] Cardiovascular disease remains the leading cause of morbidity and mortality despite improvements in clinical outcomes. Age-adjusted coronary artery disease mortality has decreased since the 1980s, especially in high-income regions. If prevention were practiced correctly, the prevalence of cardiovascular disease (CVD) would be greatly reduced. Therefore, it is not only about the predominant risk factors but also the poor implementation of preventive measures. [3,4]

Cardiovascular disease prevention is defined as a set of coordinated actions aimed at the population or an individual to eliminate or minimize cardiovascular disease and associated disabilities. This prevention should target the general population by promoting healthy lifestyle habits, and individuals, i.e., people at moderate-high risk of CVD or with established CVD, addressing unhealthy lifestyle habits (e.g., poor-quality diet, physical inactivity, smoking) and improving risk factors. [3] Prevention has proven effective, as eliminating health risk behaviors could prevent at least 80% of cardiovascular diseases. [5] Therefore, CVD is a significant economic burden on society, and effective preventive measures need to be implemented. There is a consensus in favor of an approach combining strategies to improve cardiovascular health across the population from childhood, with specific actions aimed at improving cardiovascular health in people at high risk of CVD or with established CVD. A report by the National Institute for Health and Care Excellence (NICE) estimated that a national program in the United Kingdom that reduced the population's cardiovascular risk by 1% could prevent 25,000 cases of CVD and save 40 million euros per year.[5-6]. Cardiovascular disease mortality rates could be halved with just a small reduction in risk factors, and it has been noted that eight dietary priorities alone could halve CVD mortality. [6]

One aspect that enhances any model of chronic patient care is promoting individuals' autonomy and boosting their ability to care for their lives, well-being, and health, promoting self-care. This aspect can be extrapolated to patients who have suffered from ACS, by controlling cardiovascular risk factors, such as overweight/obesity, high blood pressure, hypercholesterolemia, and physical inactivity, among others. [6]

Prevention is greatly influenced by the information a person perceives from the outside; in this regard, healthcare professionals can intervene with educational programs that incorporate the use of Information and Communication Technologies (ICTs) as means to facilitate the reach of content directed at risk groups. (7) Digital health incorporates information and communication technologies (ICTs) into healthcare products, services, and processes. In this sense, eHealth is defined as the set of Information and Communication Technologies used in the healthcare environment for prevention, diagnosis, treatment, and follow-up, as well as health management, improving the efficiency of these processes. These new technological tools, better known as eHealth, with changes in perception as they have evolved, encompass various health products and services, such as mobile applications (Apps), telemedicine, and the use of social networks like YouTube or the creation of patient-adapted blogs as support in cardiovascular education. [8]

In 2022, a prospective observational study was initiated in a cardiology unit in Madrid to evaluate the impact of telephone follow-up on patients with Acute Coronary Syndrome (ACS). Digital tools were used, such as educational YouTube videos and a blog about diet, medication, symptoms, and other relevant topics. Patients have responded positively to these resources, but their experience and access difficulties have not been evaluated. A qualitative study is proposed to understand patients' perceptions of these tools. The goal is to describe and understand the usefulness of digital tools, not to predict or control. [9]

Aims :

Evaluate the experience of patients with digital tools, such as educational videos and a blog, after being admitted for Acute Coronary Syndrome (ACS) in 2022. The aim is to identify the access difficulties to these tools and understand their perceptions of their usefulness in improving self-care.

Material and Methods:

Population and Study Area: Patients diagnosed with ACS and admitted to the Cardiology unit of the tertiary hospital during the year 2022 who were included in the telephone follow-up program for acquiring skills to manage their disease will be included.

Techniques to be Used: Based on the stated objectives, a qualitative approach with a phenomenological framework is proposed, following the principles outlined by Merleau-Ponty in his "Phenomenology of Perception." (10) In-depth interviews will be the technique used, [11] as they facilitate the subjective and intimate elucidation of human experience and bring us closer to understanding the phenomenon.

Sampling and Profiles to be Investigated: Interviews will be conducted with patients included in the telephone follow-up to understand their perceptions of the digital tools. The sample will be completed when a sufficient diversity of ideas has been heard, and no new elements appear with each additional interview or observation, known as saturation in qualitative research. However, as Denzin notes, the complexity of reality can never be fully captured, meaning saturation may never be fully achieved. [12] Mayan suggests that the researcher should continue investigating until they believe they can say something important and novel about the phenomenon in question. [12] A semi-structured interview, preferably conducted by phone and lasting approximately 20-30 minutes, will emphasize the usefulness of digital tools for understanding the disease and the participants' knowledge of diet, physical activity, sexuality, and the contribution of these tools due to the possibility of repeated viewing and reading. Additionally, questions will be asked about the ease of access to these tools and which of the two tools (videos or blog) they found easier to use. As a semi-structured interview, all opinions expressed by the patient will be recorded. (11)

It is important for the proper development of the research to establish profiles during data collection. Age and gender variables will be collected, understanding initially that differences in access to tools may exist across these variables. It is important to anonymize the patients, using the same identities used throughout the previous project. Information and consent, whether verbal or written, from the patient is fundamental for the development of the research. The videos and the blog can be accessed through the following links:

Youtube Chanel (created by the healthcare professionals of the hospitalization unit, with content authored by the primary researcher of this project) :

- **https://www.youtube.com/channel/UC2uFSK3IQtPTRRTu_0fF5RA**

Health blog(created by the primary researcher of this project) :

- **https://cuidandodetusaludes.wordpress.com/**

Statistical Analysis: In this study, a comprehensive statistical analysis was conducted to understand and contextualize the data collected in the qualitative research. Through a series of techniques and methodological approaches, the experiences, perceptions, and opinions of participants regarding the studied phenomenon were explored.

First, a descriptive analysis was performed to characterize the qualitative data obtained. Frequency distributions for categorical variables were presented, providing an overview of the distribution of responses among participants.

Subsequently, the qualitative data were coded and categorized. This process identified emerging themes, patterns, and relationships in the data, facilitating a deeper analysis of participant responses.

Ethical Considerations: The study strictly adhered to ethical guidelines established by Law 3/2018 and Regulation (EU) 2016/679 regarding personal data protection. It also complied with the Declaration of Helsinki to ensure the integrity and respect of participants. Participants were informed about data handling and the management of the generated database, which was disaggregated and accessible only to the principal investigator. Upon completion, all databases were deleted according to protocols. Anonymity was protected following Law 41/2002, ensuring confidentiality for comments about patients and third parties. Informed consent was obtained via a detailed form, and the study was approved by the hospital's ethics committee. Data were stored securely with unique codes, and identifying information was destroyed after the study, limiting access to the principal investigator.

Results

A semi-structured interview was conducted with a total of 90 patients who had completed the 12-month telephone follow-up, all of whom criteria with acute coronary syndrome (ACS) as their primary medical diagnosis. Within this group, 70% were men and 30% women, with an average age of 69.2 years. The age distribution was as follows: 11% were between 40 and 55 years old, 40% between 56 and 69 years old, 32% between 70 and 80 years old, and 17% were over 80 years old.

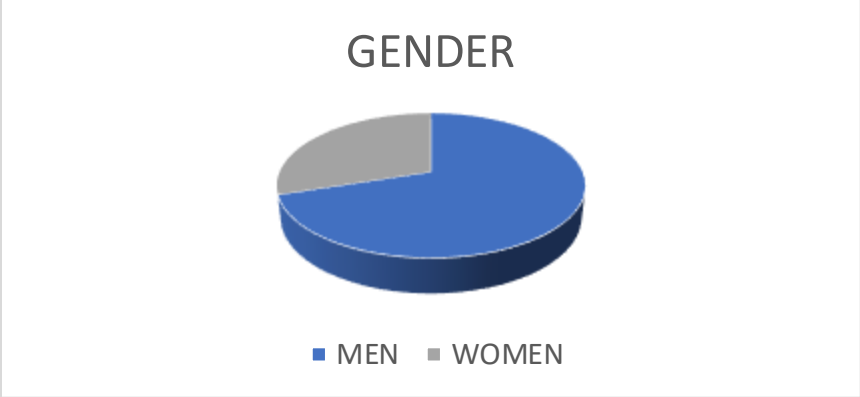

Figure 1: Gender distribution of the sample. Own work.

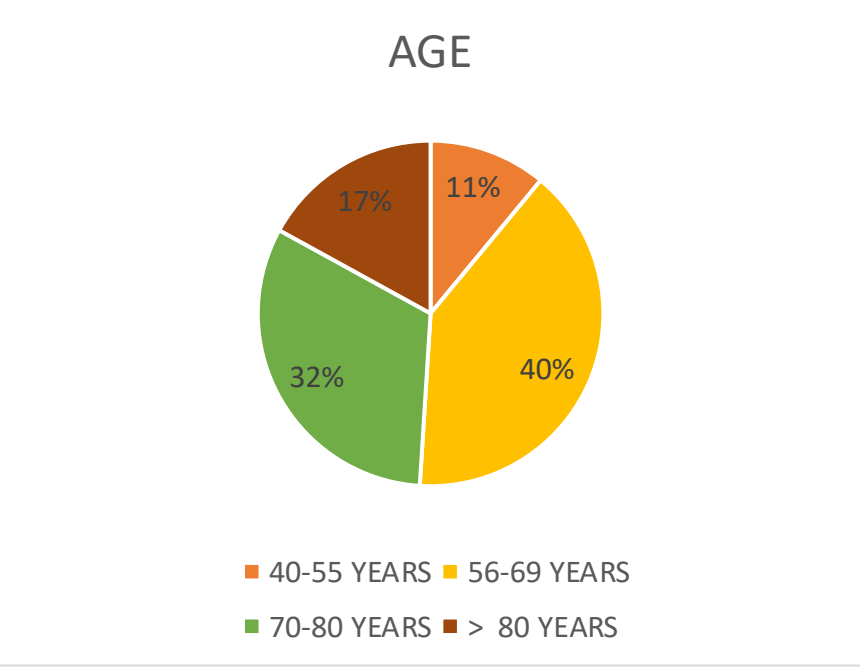

Figure 2. Age distribution of the sample. Own work.

A thematic analysis was conducted to identify and explore the main themes from the data, allowing for a deeper understanding of participants' experiences and perspectives. Triangulation was used as a methodological strategy to enhance the validity and reliability of the results by comparing different data sources and collection methods. A comparative analysis identified patterns and variations in responses among subgroups of

participants. The results were interpreted in the context of the research question and existing literature, discussing the practical and theoretical implications of the findings, as well as the study's limitations and future research directions. The statistical analysis, carried out using SPSS 25.0, contributed to the knowledge in the field of patient education for ACS using digital tools

In this qualitative research based on interviews, patient responses were categorized, providing various opinions about their experience with digital cardiovascular education tools. Some of the responses included(Patient perceptions during the interview):

"Limited accessibility due to my age, but my family helped me."

"These tools have improved my knowledge."

"Having the option to watch it in video or read it increases the likelihood that these tools will be used."

"I prefer reading to watching videos."

"I prefer videos because they are more visual."

Based on these responses, the following results were obtained:

All 90 patients reported interacting with both the provided videos and the blog. Of these, 54 patients expressed a preference for the videos over the blog, while 36 found reading the blog more comfortable. Additionally, 15 patients, mainly from the older age group, highlighted difficulties accessing the tools due to a lack of familiarity with technology. However, it is important to note that all participants reported receiving help from family or friends, underscoring the importance of social support in overcoming these barriers.

A significant finding was the perceived usefulness of digital tools in facilitating self-care among ACS patients. All 90 patients considered them valuable aids for improving their knowledge, addressing questions, and complementing professional healthcare services when access was limited. However, it is essential to highlight that the entire sample emphasized the importance of direct contact with healthcare professionals.

Discussion

The research conducted through semi-structured interviews with 90 patients diagnosed with acute coronary syndrome (ACS) presents revealing results that provide a comprehensive view of patient interaction with digital tools in the self-care of this medical condition. These findings are not only significant in themselves but also underscore the critical need to understand and address patient needs and preferences in the context of current healthcare. [13] In this in-depth analysis, we explore the key points of this research, highlighting the most significant aspects emerging from the collected data.

A notable aspect of this study is the sociodemographic distribution of the sample, which reflects trends consistent with previous research on ACS. The predominance of men in the sample, compared to women, aligns with the general understanding that ACS affects men more than women, a trend observed in various epidemiological and clinical studies. Additionally, the significant presence of patients over 55 years old is consistent with the understanding that ACS is more common in older adults, an observation supported by numerous studies identifying advanced age as a significant risk factor for this cardiovascular disease. [14]

An important finding of this study is the patients' overall preference for videos over the blog as a medium for education and support in self-care. This preference highlights the importance of using information formats that cater to patient preferences and needs to maximize the impact of educational interventions. Moreover, it underscores the potential of audiovisual media to enhance patient understanding and engagement in managing their disease, an observation consistent with scientific literature demonstrating the efficacy of educational videos in promoting health and self-care in various populations. [15-17]

The identification of technological barriers, especially among older patients, presents significant challenges in the effective implementation of digital tools in healthcare. This observation highlights the urgent need for educational and training programs specifically designed to address the digital divide and improve technological literacy among older patients. Overcoming these barriers would not only facilitate access to digital tools but also promote equity in healthcare and improve health outcomes across the population. [18]

The study's results suggest a positive patient perception of the usefulness of digital tools in managing their disease. This conclusion underscores the transformative potential of technology in empowering patients and improving health outcomes. The ability of digital tools to provide continuous information and support to patients, even when access to healthcare is limited, is particularly noteworthy. [19, 20] However, it is essential to recognize that patients deeply value direct contact with healthcare professionals, emphasizing the importance of integrating these digital tools as a complement, rather than a substitute, for conventional healthcare. [21]

These findings shed light on the nuanced experiences of patients with digital tools in the context of self-care for ACS. They underscore the importance of user-friendly interfaces and the role of social support networks in ensuring accessibility. Additionally, they highlight the complementary nature of digital tools alongside traditional health services in promoting the well-being of ACS patients.

Possible study limitations include the sample size and composition, as the research relied on interviews with 90 patients, which may limit the generalizability of the findings to a broader population. The predominance of men in the sample could also bias results, not accurately reflecting the gender distribution in the general population affected by ACS. Additionally, while semi-structured interviews provide detailed insights into patient experiences, they are susceptible to biases in interpretation from the interviewer and responses from participants. The generalization of results is another concern, as findings may vary across different cultural, socioeconomic, and healthcare contexts. The study could have also benefited from more rigorous control of variables influencing patient preferences and perceptions of digital tools, such as access to technology and prior health education. Finally, while focusing on the patient perspective, the study could have included insights from other stakeholders, such as healthcare professionals and technology developers, to provide a more comprehensive understanding of the challenges and opportunities in using digital tools for ACS self-care.

Conclusions:

This study offers a comprehensive view of patient experiences with digital tools in ACS self-care, aiming to improve care and self-management for ACS patients. It identifies areas for future research, including evaluating interventions to overcome technological barriers and enhance the accessibility of digital tools. The study emphasizes the need to effectively integrate these tools into clinical practice and advocates for a patient-centered approach in designing self-care interventions to meet individual patient needs and preferences for better health outcomes.

Conflict of interest statement

There are no conflicts of interest among the authors of the work

Funding statement

The study has not received any funding

Data acquisition

The data has been obtained following the data protection and patient privacy law and endorsed by the Ethics Committee for Research at the Hospital Clínico San Carlos, with the approval of the study protocol.

Statistics:

Of the authors, two have specialized training in statistics. Specifically, Professor Pacheco del Cerro, Enrique, has conducted the analysis.

Author responsibility:

Affirm that methods used in data analyses are appropriately applied within the study design.

Agree to take responsibility for the statistical approach's appropriateness, conduct, and interpretation.

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