

Original Research Article

## Internet Enabled Identification of Challenges in Management of Cardiovascular Disease: A Systematic Review of Videos

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### Abstract

**Background** Cardiovascular diseases (CVD) are one of the most common diseases related to lifestyle diseases that accounts for increased hospitalization, economic burden, mortality and morbidity. The challenges faced by clinicians are varied and understanding these will enable to identify solutions and successfully apply in the management of CVD. Internet videos are a dynamic pool of resources with wider perspectives and content can be assessed in short time.

**Objectives:** To review the videos available on internet to identify the clinician-mentioned challenges and solutions in management of CVD **Methods:** A comprehensive content analysis and review of videos available on internet through open source including clinician interviews across primary, secondary level of care is performed. **Results :** 55 videos with total viewing time of 3 hours 6 minutes 6 seconds were included for review. *Clinician-centered* challenges were: incompetency to address the psychological emotions of the patients (33%), delayed diagnosis of CVD (25%), failure in adapting to technical advancements (7%) and patients reliance on information available on internet (4%). *Patient-centered* challenges were: failure to adapt diet and exercise related life style modifications (17%), late presentation of disease with complications (16%), and patient's financial status (4%) as a challenge in prescribing treatment options. Solutions proposed were: improved doctor-patient communication through effective listening and building of trust, patient education through inclusive management plans along with patients, lifestyle modifications by incorporating physical activity into daily living, risk stratification using screening tools, organization of services (home visits, multi-center study), usage of digital sensors in primary care initiatives and employment of heart failure specialist nurses.

**Conclusion:** This study reveals briefly about the clinicians challenges and solutions in the management of CVD.

**Keywords:** Cardiovascular diseases, clinician challenges, solutions.

### Introduction

Cardiovascular disease (CVD) is the leading cause of non-communicable disease death with an increasing worldwide incidence. In 2012, of the 56 million global deaths, 38 million, or 68%, were due to non-communicable diseases<sup>1</sup>. India also bears the burden of cardiovascular disease as it claims 3.7 million deaths or a quarter of all deaths annually in the South East Region (2.0 million among males and 1.7 million among females)<sup>2</sup>. In this digital age, the easy accessibility of internet has made it to pave its way even into research<sup>3</sup>. However there is a gap to bridge this knowledge of internet into the current scenario of data collection. This paper aims to make use this wide range of resources as a platform to identify the challenges faced by a clinician

and to bring about appropriate solutions. This web based initiative will make our task easier and save time.

Quantitative research is the process of collecting, analyzing, interpreting, and writing the results of a study, while qualitative research is the approach to data collection, analysis, and report writing differing from the traditional, quantitative approaches<sup>4</sup>. As we are interested in internet interventions we opted for a qualitative methodology rather than a quantitative methodology (such as a questionnaire study that would have forced participants to choose between predefined criteria generated by the researcher). We attempted searching for meta-analysis studies in the literature with similar methodology of reviewing the video content available on open source platform on management of life style diseases and to our knowledge we could not find any studies either in international arena or national research

areas. This is a first of its kind attempt made to harness the potential of easy accessible platform in internet enabled digital tools to understand the global challenges in the management of lifestyle diseases and we tried to arrive at solutions that we have been implemented or proposed by the clinicians attending to lifestyle diseases. We believe this to be an effective and time optimizing research exercise to identify challenges and solutions in an innovative manner from the interviews of care giving physicians across the globe.

**Material and methods**

A comprehensive content analysis and review of videos available on internet through open source including clinician interviews across primary, secondary level of care was performed. We searched for interview videos containing information regarding risk factors, mortality, interventions designed to reduce CVD, treatment strategy. An intense search was made by using terms such as cardiologist interview, lifestyle diseases video, challenges faced by cardiologist, Drexel cardiologist, Scripps cardiologist, interviews of Indian cardiologist. Thus videos available on the internet were chosen if the content fits into the challenges and interventions designed for the management of CVD. In order to get apt and precise information interviews of doctors from various specializations like cardiology, internal medicine, and family medicine were included in the review. Each video link was opened and the researcher viewed the content and identified the themes and subthemes under the heading of "Challenges in the management of cardiovascular diseases". The researcher, while watching the videos had made an entry into an excel sheet all the themes identified as significant challenges in the management of life style diseases and also the solutions proposed by the clinical experts. Later the entries were analyzed and most common and recurring themes were grouped under main challenges as against the solutions.

**Results**

There were 55 videos<sup>5-58</sup> with total viewing time of 3 hours 6 minutes 6 seconds included for review. Thus a thorough analysis of the interview videos was made and seven themes were identified which were found to fall under two broad categories namely ‘clinician centered challenges’ and ‘patient centered challenge’ as listed in (Table 1).

The clinician centered challenges was further diverse in terms of addressing the psychological emotions of the patients, fatal and serious consequences of delayed diagnosis of CVD, failure in adapting to technical advancements in management and care provision by care givers and patients reliance on information available on internet. As presented in (Table 2), the leading challenge identified as faced by the clinician was addressing the

psychological emotions of the patients, which accounted for 33% followed by delayed diagnosis which accounts for 25% of the challenges faced. Failure in adapting to technical advancements by busy care givers is posing a challenge to the clinicians which accounts for 7% and patients' reliance on information available on internet accounted for 4% of the challenges faced by clinicians.

**Table 1 Category of identified themes under challenges in management of life style diseases after video content analysis**

Clinician centered challenges	Patient centered challenges
Addressing the psychological emotions of the patients	Failure to adapt diet and exercise related life style modifications
Delayed diagnosis of CVD	Late presentation of disease with complications
Failure in adapting to technical advancements	Patient's financial status
Patients reliance on information available on internet	

**Table 2 Clinician-centered challenges for management of CVD after video content analysis**

Addressing the psychological emotions of the patients	33%
Delayed diagnosis of CVD	25%
Failure in adapting to technical advancements	7%
Patients reliance on information available on internet	4%

Despite the clinician's efforts in managing CVD certain patient centered factors like failure to adapt to diet and exercise related lifestyle modifications, late presentation of the disease with complications, financial status were also imposed as a challenging burden upon the clinician in managing CVD (Table 3). As shown below, 17% of the patient centered challenges are related to failure in making life style modifications, 16% of them presenting in late staged when complications were set in, and also poor financial status of the patients contributing to 4% of the challenges mentioned in the video content analyzed.

An attempt was made by the researcher to summarize the findings for content analysis, for the challenging obstacles with a specific solution against each in the form of a matrix as in (Table 4).

**Table 3 Patient-centered challenges towards prescribing treatment options after video content analysis enabled by internet**

Failure to adapt diet and exercise related life style modifications	17%
Late presentation of disease with complications	16%
Patient's financial status	4%

**Table 4 Challenge-Solution Matrix for the management of cardio vascular diseases as identified from internet enabled video content analysis.**

Challenges	Solutions
Handling of psychological emotions and making patient's convey their complaints	Building trust through effective doctor-patient communication
Delayed diagnosis of CVD	Regular usage of risk stratification tools, organization of comprehensive services (home visits, multi-center study), provision for special measures like primary care initiatives and heart failure specialist nurses
Poor diet and inadequate exercise	Health education for promotion of Paleo-diet, regular exercise monitoring
Patients who are in advanced stages on ineffective medications or geriatrics who are medically unfit for undergoing surgical procedures	Providing patient education at appropriate time by explaining to the patient the disease outcomes through effective doctor-patient communication
Improper lifestyle habits	Lifestyle modifications (eg: smoking cessations), awareness programs, regular screening procedures
Practical difficulties in updating with new technical advancements	Clinicians should be updated with inbuilt in-service training programs, and design new need specific solutions
Availability of immense information to the public	Providing evidence based patient education through doctor patient communication and by proving leaflets with latest advances from authentic and validated sources of information such as WHO or high impact factor journals
Poor financial status of the patient	Bring about cost effective procedures(surgical treatment)
Failure to adapt diet and exercise related life style modifications	17%
Late presentation of disease with complications	16%
Patient's financial status	4%

**Discussion:**

In this study, we identified two sets of challenges for the management of CVD from the video content analysis as: clinician centered challenges and patient centered challenges. The major challenge faced by the clinician was addressing the psychological emotions of the patients<sup>9,12,13,25,32,34,42,48,51,52,53,56,58</sup> which accounted for 33%. This was a major concern because of the patients' inability to express their symptoms due to improper

patient interaction process carried out in busy clinical setting. Hence the clinicians are unable to provide the convincing treatment plans. Establishing an effective doctor-patient communication by providing compassion, empathy and establishing trust can overcome this challenge<sup>6,7,9,12,22,24,25, 26,27,29,32,33,47,52,54,56</sup>. Cicely Kerr et al, in their study focused on interactive health communication applications (IHCAs) that combine high-quality health information with interactive components, such as self-assessment tools, behavior change support, peer support, or decision support, are likely to benefit people with long-term conditions<sup>63</sup>. Employing these applications in trustworthy environment may help to overcome this challenge. Jean A. Wagner, in her study titled 'Top ten challenges in heart failure management' also identified failure to recognize the signs and symptoms of disease by patients, addressing life style modifications, references to advances in therapy by knowledge updation as challenges similar to our findings from content analysis of the videos<sup>62</sup>.

Most of the patients consult the clinicians only during the later stages of the disease, because chronic diseases are mostly symptomless and even if there are signs of illness the patients are unaware of their symptoms poor health literacy. This could lead to delayed diagnosis<sup>6,8,13,14,15,18,22,45,58</sup> with late presentation involving complications, which accounts for 25% of the challenges faced. Early diagnosis could be made by risk stratification using screening tools such as mentioned by Lee, Kyoung Suk<sup>61</sup>, ie providing symptom diary along with education and counseling session, may be effective in identifying patients in early stages by also monitoring the patient's blood pressure, blood glucose, BMI, cholesterol and triglycerides during regular visits to the clinic. Margaret Glogowska<sup>60</sup>, have shown that a nurse and nurse practitioner-run program, under the supervision of a cardiologist, decreases patient morbidity, emergency department visits, hospital admissions, overall utilization and cost.

A wide variety of digital innovations are revolutionizing healthcare but in a busy clinical practice the clinicians are unable to update themselves to these advancements. This imposes a challenge to the clinicians, which accounts for 7% as they were not able to make use of these advancement which are minimally invasive to the patient<sup>35,41,57</sup>. This could be overcome by regular updation to the new technical advancements and acquiring adequate practice to perform those procedures. With digital revolution and technological advances unfolding rapidly, there are many platforms for clinicians to upgrade their skill set with simulation programs and also through employment of artificial intelligence (AI) tools.

Internet and mobile technologies provide 365 days/24hour wide and easy also low-cost/no-cost accessibility to a large amount of data and the web developers and advertisers misuse this by providing a huge amount of misleading information to the public. Literate patients rely upon this available information to improve their understanding so much that it accounts for 4% of the clinician faced challenges<sup>26</sup>. It is the responsibility of the clinician to convince such a misguided patient by providing evidence based health education and also having health educators/clinical counselor as part of team to further clarify the doubts of patients and guide them in decision making. In their study, Kerr et al mention the need to provide practical information to the patients by directing to the websites which provide authentic information so as to minimize the misinformation available to patients though it cannot be controlled completely<sup>63</sup> Cicely Kerr et al.

Despite the clinician's efforts in managing CVD certain patient centered factors like failure to adapt to diet and exercise related lifestyle modifications, late presentation of the disease with complications, financial status were also imposed as a challenging burden upon the clinician in managing CVD. Most of the patients are unable to adapt to sudden changes like diet and exercise related lifestyle modifications which is a leading challenge accounting for 17% of the patient centered challenges in our study<sup>5,17</sup>. Inability of the patients to bring about lifestyle modifications leads to poor outcomes such increased morbidity and mortality. Educating patients about incorporating exercise into daily life activities such as parking the car at the furthest spot of the supermarket while going on a car ride and taking a walk from there onwards has been identified as successful integration of physical activity into daily activities. Regarding dietary habits following a paleo diet might be really effective as mentioned in studies<sup>17</sup>. Alex Cotterez, BS et al in their meta-analysis study of impact of web based strategies on self-management of diabetes mellitus-2, found web based tools to be a viable option. Promoting these self-management strategies among patients may result in better patient engagement and accountability in their disease management<sup>59</sup>.

The burden of rising health care costs definitely has an implication upon the care seeking behavior and accounts for about 4% of the patient centered challenges. This is mainly because most of the surgical treatment procedures are expensive imposing a financial burden upon the patient. But if new researches on cost effective procedures<sup>43</sup> could be made it will definitely assist to overcome this problem.

**Limitations:** Despite our vigorous attempts to identify relevant videos of Indian clinician interviews it is possible that they might have been missed. Hence the study was

performed by making use of videos which are mostly from clinicians who are US based. Secondly there might be some practical difficulty towards implementing these solutions in the current hospitals based in Indian scenario due to the above mentioned primary limitation. With our utmost efforts the solutions mentioned by the clinicians for the specific challenges was drafted in the form of a matrix, which might be more applicable to US scenario since they are video contents from US clinicians. Thirdly being a first of its kind study we could not find relevant articles for in-depth comparison.

**Conclusion:** Internet enabled solutions identified from global clinical settings can be tried in local settings by adapting certain components to meet the local requirements.

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