

REVIEW

The Effectiveness of Telemedicine on Stigmatization and Treatment Burden in Patients with Health Compromising Lifestyles and Chronic Diseases: A Critically Appraised Topic

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Abstract:

Objectives: To conduct a critical appraisal of peer reviewed articles on the effectiveness of telemedicine on stigmatization and treatment burden in patients with health compromising lifestyles and chronic diseases.

Methods: This study critically appraised peer-reviewed article on the effectiveness of telemedicine on stigmatization and treatment burden in patients with health compromising lifestyles and chronic diseases. Treatments included e-health interventions, information and communication technologies used in health care, internet-based interventions for diagnosis and treatments that encouraged collaborative care for patients with chronic diseases. This paper critically appraised the full text of each relevant peer-reviewed article adapting the Occupational Therapy Critically Appraised Topics (CATs) template while using the Oxford Centre for Evidence-based Medicine- Levels of Evidence (2011) model to assess for best evidence or quality.

Results: Initial internet search using Psychinformation; PubMed; Medline; ProQuest; CINAHL; OT seeker and the Cochrane Library generated over 1450 titles/abstracts. Following abstract appraisal, 30 articles were selected for full text assessment. Five of the final articles selected for this critical appraisal alluded to the effectiveness of telemedicine in reducing the treatment burden of stigmatization on patients with chronic diseases. Majority of the appraised articles indicated the effectiveness of telemedicine in changing behaviours.

Conclusions: All the appraised articles alluded to the effectiveness of telemedicine in curbing some of the treatment burdens of stigmatization for patients with health compromising lifestyles and chronic diseases. However, it is evident that the use of other intervention methods such as government policy, public education and patient empowerment in conjunction with telemedicine would better reduce the effect of stigmatization and facilitate the medical interventions for patients with chronic diseases.

Keywords: Telemedicine, stigma, stigmatization, health compromising lifestyles, chronic diseases, intervention

Introduction

Stigma can be described as negative attitudes that affect people's interactions and activities in a harmful way (Obesity Society, 2018). It can be expressed in various forms, such as verbal forms of prejudice (for instance, ridicule, teasing, insults, stereotypes, derogatory names, or through the use of pejorative language), physical stigma may include touching, grabbing, or other aggressive behaviours, or other barriers and problems caused by weight (for example, medical kit that is too small for obese patients, seats in public settings which do not fit obese persons, or stores which do not sell clothing in large sizes (Obesity Society, 2018). It is a perceived negative characteristic that causes someone to degrade or think very little of the person in question (Salters-Pedneault, 2017). According to Salters-Pedneault (2017), people are likely to exclude individuals in stereotyped groups, to judge persons in these groups for undesirable actions and to discriminate against the stigmatized individuals. In an extreme form, stigma can result in both subtle and overt forms of discrimination, such as employment discrimination where the stigmatized individual is denied a position or promotion because of his or her appearance, regardless of being suitably competent for the position (Obesity Society, 2018).

Unfortunately, Stigmatization remains a debilitating stressor for patients with chronic diseases (Vanable, Carey, Blair & Littlewood, 2006). Stigma has notable negative effects on patients in that it contributes to their low self-esteem (Lv, Wolf & Wang, 2013). In addition, Marta (2008) asserts that stigma is still the major reason why a lot of people are scared to visit a physician to find out if they are infected with the HIV virus or to seek for treatment if affected. According to Omosanya, et al., (2014), stigmatization and discrimination have negative impacts on treatments and act as barriers to all HIV/AIDS activities. Apart from this, Druss & Rosenheck (1998) posit that people with serious mental illnesses are disproportionately uninsured, a situation often associated with discrimination based on pre-existing health conditions. In addition, The National Mental Health Reduction Partnership (2013) noted that stigma can be used to discriminate and downgrade people. The preconception and distress caused by stigma may even hinder people from coming forward and seeking the medical help they need (The National Mental Health Reduction Partnership, 2013). In other words, stigma

can also prevent people from providing help or being caring (The National Mental Health Reduction Partnership, 2013).

Apart from the notable negative effects of stigmatization on people living with various mental illnesses, Phlelan et al., (2015) affirm that stigma can reduce the quality of care for patients with obesity notwithstanding the best intentions of healthcare professionals to offer high-quality care. This is because several healthcare professionals have strong negative attitudes and stereotypes about individuals with obesity (Phlelan et al., 2015). There is significant evidence that supports the assertion that such attitudes impact a person's perceptions, judgment, interpersonal behaviour and decision-making (Phlelan et al., 2015). Given the above facts, one can infer that there are correlations between stigmatization and depression, low-level of medication adherence, poor physician office visits, and psychological adaptation and lifestyle changes difficulties among patients with chronic diseases (Link et al., 2001; Phlelan et al., 2013; Markowitz, 1998).

This explains why Howell, Heiser and Harrington (1999) posit that stigma is a burden for substance abuse women, particularly for pregnant women and nursing mothers. For instance, Poole and Isaac (2001) state that stigma limits a mother's access to health and social services due to shame, projected fear of losing custody of her child in the process of seeking for medical help, and the possibility of being treated poorly and judged because of her substance abuse issues. Similarly, people who are obese are highly stigmatized, and are most likely to face various forms of prejudice because of their weight (Brownell, Puhl, Schwartz & Rudd, 2005). According to Brownell, Puhl, Schwartz and Rudd (2005), the rate of weight discrimination in the United States has increased by 66% over the past decade. The discrimination against individuals who are obese is comparable to racial discrimination (Andreyeva, Puhl, & Brownell, 2008).

Simply stated, the stigmatization of people with mental illness is often linked to people who are commonly branded by the public as untrustworthy and incompetent (Angermeyer & Schulze, 2001). Furthermore, in severe cases, the stigmatized persons are confined and hidden from their societies (Rabkin, 1974). This is because people with mental illness are viewed as dangerous, unpredictable and this in part "justifies" their discrimination by the society (Ku & Ha, 2015). The problem of stigmatization is of notable importance in the prevention and treatment of chronic diseases such as diabetes, HIV/AIDS, obesity, infertility, mental illnesses, and in the reduction of health compromising lifestyles. Stigma can exacerbate depression, promote social seclusion and reduce one's quality of life by hindering access to employment, housing and other social determinants of health (Corrigan & Matthews, 2003). Apart from this, Chang and Horrocks (2006) state that the social exclusion of families due to stigmatization is one of the major barriers to informal social network support, which may be an essential source of respite both from psychological distress and a means for getting access to formal treatment and other related formal support. Therefore, this paper conducted a critical appraisal of peer-reviewed articles on how we may use telemedicine to reduce stigma and the treatment burden among patients with health compromising lifestyles and chronic diseases. Based on the reviewed literature, this paper concludes that the use of telemedicine may reduce the effect of stigma and the treatment burden in patients with health compromising lifestyles and chronic diseases.

Methods and Procedures

This study critically appraised peer-reviewed article on the effectiveness of telemedicine on stigmatization and treatment burden in patients with health compromising lifestyles and chronic diseases. Treatments included e-health interventions, information and communication technologies used in health care, internet-based interventions for diagnosis and treatments that encouraged collaborative care for patients with chronic diseases. The full text of each relevant peer-reviewed article was critically appraised using the Occupational Therapy Critically Appraised Topics (CATs) template. In addition, the Oxford Centre for Evidence-based Medicine- Levels of Evidence (2011) model was used to assess for best evidence or quality.

The following terms guided the data collection: telemedicine and obesity; stigmatization and social determinants of health, telemedicine and chronic diseases, telemedicine and health compromising lifestyles; the treatment burden of stigmatization; outcome (s) of the adoption of telemedicine on stigma, and challenges of telemedicine and chronic diseases.

Data were collected using Psych information; PubMed; Medline; ProQuest; CINAHL, EMBASE, OT seeker, The Cochrane Library, Nih.gov, Academia.edu, and Biomedcentral.com databases. To ensure the quality of this study, this paper selected articles that used randomized control trials, cohort studies, case-control studies and systematic reviews research methods. The major reason was to limit bias. Based on the focus of this study, the following journal articles were included: studies examining patients with chronic diseases and health compromising lifestyles that can access telemedicine, studies that considered the effects of telemedicine on treatment burden, studies on the effect of telemedicine on stigma and stigmatization, studies on the effect of stigma on social determinants of health, and studies on the challenges facing the utilization of telemedicine by both health and social care consumers and social providers.

This paper excluded studies examining non-chronic diseases, studies dealing with face to face health and social care interventions that did not involve virtual interactions (i.e. videophones, video chats, etc.), and studies on telemedicine, stigma and chronic diseases that are not peer-reviewed or published in reputable journals. To ensure that the information in this study is current, Journals published before 2007 were also excluded.

Results

The Initial internet search using Psych information; PubMed; Medline; ProQuest; CINAHL; OT seeker and the Cochrane Library generated over 1450 titles/abstracts. Following abstract appraisal, 30 articles were selected for full text assessment. Five of the final articles selected for this critical appraisal alluded to the effectiveness of telemedicine in reducing the treatment burden of stigmatization on patients with chronic diseases. Majority of the appraised articles indicated the effectiveness of telemedicine in changing behaviours.

Table 1: Summary of Study Designs of Selected Articles

Study Design/Methodology of Selected Articles	Level	Number Located	Author/Year
Randomized Control Trials	2	3	Davis et al. (2013). Watson et al. (2016). Wang et al. (2017).
Systematic Reviews	1	2	Chen et al. (2012). Kasckow et al. (2014)

Best Evidence

This study identified the above articles as the “best” evidence for this critical appraisal due to the following reasons:

- Since the preconception and distress caused by stigma may hinder people from coming forward and seeking the medical help they need (The National Mental Health Reduction Partnership, 2013), and given the fact that stigma discriminates, and downgrades people based on their personal features, illnesses, geographical locations, etc., therefore, all the articles in this study alluded that the use of telemedicine may be effective in reducing stigmatization and treatment burden in patients with health compromising lifestyles and chronic diseases.
- Most of the studies investigated chronic diseases and telemedicine or e-health
- The studies showed the effectiveness of telemedicine in chronic illness diagnoses and interventions
- The authors of the appraised articles controlled for both researchers and research subject bias using by adopting either randomized control trials or systematic review research methodologies.

Critical Appraisal of the Final Five Selected Articles

This study used the template on “how to critically appraise a paper (Sabin, 2013)” to provide additional critical appraisal on the five articles selected for this study. These five broad questions included:

1. What is the research question?
2. Is the study ethical?
3. Is the study design valid and appropriate?
4. What are the results?
5. What are the implications of the findings for clinical practice?

Davis et al. (2013):

The authors provided scientific rationale for their study. They stated that, “The number of children living obesity in the United States has increased rapidly over the past several years to the extent that childhood obesity is now regarded as one of public health epidemics. In addition, they posited that, existing data show that weight status by age seven is directly linked to adult weight status and adult health problems. Apart from providing cogent scientific reasons for their study, the authors equally provided a pre-defined hypothesis “To extend this line of research, our team was interested in finding whether such a Stage 3 family-based behavioral group intervention could be delivered to rural families in their communities solely relying on interactive technology, including phone and tele-video, also known as telemedicine.” Furthermore, this research was conducted in Kansas, United States among elementary students living in rural Kansas. The interventions involved randomized children, and families who participated in eight weekly psycho educational groups over telemedicine led by trained PhD-level psychologists or trained graduate students or postdoctoral fellows, followed by six monthly meetings. The researchers compared this intervention to a similar intervention through a standardized visit with a primary care physician (control group). In addition, the researcher clearly dealt with their research outcome (s). They considered the effectiveness of a multidisciplinary weekly family-based behavioral group delivered via telemedicine to rural areas, compared with a structured physician visit intervention.

The second major question in critically appraising Davis et al. (2013) involves ethical issues. It seems that there was a real need for this study. The article stated that the rapid increase in the occurrence of childhood obesity and the direct link between childhood weight status and adult weight status and health issues prompted Davis and his colleagues to conduct this trial. The authors seemed to have been motivated by the principle of equipoise in that they posited that treating childhood obesity may promote adult weight status and enhance adult health outcomes. The researchers followed all the stipulated ethical procedures in recruiting their research participants, and in conducting this study. For instance, relevant institutional review board approved all the study procedures while the participants provided written informed consent through their various schools. Furthermore, representatives from the participating schools received the mandatory institutional online training in Human Subjects Research, Conflict of Interest, and HIPAA, including training on study-specific procedures, which was conducted by the researchers.

However, the research sample was relatively small. In addition, the participants came from some rural areas in Kansas; therefore, the results of this research may not be generalized to rural areas in other states. Another problem with the research sample is the fact that the participants were mainly Caucasian, which suggests that the research finding may change if other races were represented. Furthermore, while the researchers stated that National Institutes of Health (DK068221 to A.M.D.) funded their research, they failed to declare their financial interest in this study.

The third major question in this appraisal is the research design. It seems that the research design was appropriate for this study. This is a Non-inferiority trial (RCT), which demonstrated that the use of a multidisciplinary weekly family-

based behavioral group delivered via telemedicine to rural areas, is not substantially worse than a structured physician visit intervention. However, it seems that this study was not categorically blinded, which seems to leave room for elements of bias. Another major research question is the research results or findings. The authors stated that, “Child BMIz outcomes were not statistically different between the two groups ($F_{4,0.023}$, $p_{4,881}$) and that improvements in BMIz, nutrition, and physical activity were seen for both group.” This aligns with the study design. It was also noted that out of the 58 participants, 31 were randomly assigned to the Telemedicine group while 27 were randomly assigned to the Physician Visit group; there were no significant between group differences at baseline.

The fifth question or item in the critical appraisal of Davis et al. (2013) is the implications of the findings for clinical practice. There several clinical implications in this study, which may be used to reduce the stigma of childhood obesity and its associated health issues. For instance, the study has established that telemedicine or other methods of interactive tele-video appear to be viable for the delivery of realistically supportive treatments or interventions for rural families facing the issues of childhood obesity. In addition, this research seems to suggest that families in remote areas who commit to this type of intervention are likely to show up for treatment and to encounter few technical problems. Another implication of this study to public health practice is its positive effects on health behaviour. This is because, telemedicine or the use of other interactive tele-video modalities encourages immediate access to care in that this approach to medical intervention reduce the time it takes families and health providers to travel from one location to the other (rural area to the medical centre or even from one’s home to the care facility). In addition, the use of telemedicine may also facilitate access to highly trained specialists irrespective of the patient-physician’s location.

Watson et al. (2016)

Like Davis et al. (2013), Watson and colleagues provided scientific justifications for engaging in this research. For instance, they posit that, research reports on tele-based low-intensity therapies for cancer patients have largely provided low-moderate quality data, primarily due to “lack of patient pre-selection at study enrollment based on mental health needs.” In addition, they asserted that the reason of this study was to evaluate “a telephone-delivered high-intensity CBT, provided by level 3/4 mental health professionals in a clinically referred cohort, reflecting a real-world service model.” They also stated that limited studies, at beginning of the intervention, have used this method.

Apart from providing scientific justifications for this study, Watson and colleagues had a pre-defined hypothesis for this study. For example, the authors hypothesized that telephone-delivered CBT (T-CBT) will promote “change in Hospital Anxiety and Depression Scale (HADS) anxiety and depression after treatment compared to baseline.” The researchers also provided information on the location of this study. In addition, the study provided enough data on the study participants. For instance, the authors posit that study participants were

drawn from “patients referred to the Royal Marsden Hospital's Psychological Care Service over an 18-month period by clinical staff (predominantly medical consultants and specialist cancer nurses not necessarily trained in psychological screening or assessment) was approached.”

What intervention(s) was compared? The study compared Telephone-Delivered Cognitive Behavioural Therapy (T-CBT) to CBT face-to-face therapy (TAU-CBT) in cancer patients with high psychological needs, in relation to mental health and coping.

In addition to critically appraising Watson et al. (2016) study questions, this review also appraised the ethical validity of the study. There is enough evidence from the research report to suggest that the research design was valid and appropriate. The study was a prospective randomised equivalence trial comparing TAU-CBT with T-CBT and it did not use a treatment control group because previous data indicated efficacy of standard care CBT for cancer patients.

Additionally, this study did not achieve equivalence because of low participant recruitment. Most of the participants wanted medical interventions but refused the trial. Given the nature of this study, it is possible that the researchers failed to adequately control for confounders and bias.

However, the study followed the “CONSORT principles and requirements of the UK Medical Research Council on assessment of complex psychological interventions.” Likewise, the Royal Marsden NHS Foundation Trust Ethical Committee NHS/HSC R&D (Protocol REC 09/H0801/60) approved this study, and all the study participants provided written informed consent. While the authors acknowledged the Royal Marsden Foundation Trust Charity CP funded this study, they failed to declare any conflict of interest. Concerning the research outcomes, the authors stated that, the “delivery of CBT to patients with clinician identified high need can be offered according to patient choice without loss of mental health benefit. Both TAU-CBT and T-CBT are effective at reducing mental health problems on the specific outcome measures.”

There several clinical implications in this study, which may be used to reduce the stigma on the health issues associated with cancer. Simply stated, this study provides a model for cancer treatment in a real-world service. While telemedicine may not significantly improve health care equity, this study suggests that patient's choice and convenience will be major factors in deciding on therapy delivery method, without hindrances to patients in mental health benefits. Promoting patient's choice and convenience through telemedicine or tele-based cancer intervention will no doubt reduce stigma and cancer treatment burden.

Wang et al. (2017)

This is another randomized controlled trial, which investigated the use of internet-based integrated approach to the management of diabetes. Like the first two articles, Wang and colleagues provided scientific motivations for this study. For instance, they alleged that patients with diabetes are unable to control the development and progression of diabetics effectively because the existing medical resources for regular real-time blood glucose management are inadequate and expensive. In addition, they also provided pre-defined hypothesis by stating that “an internet-based telemedicine service platform that allows real-time collection

of the patients' medical information and timely delivery of the medical team's advice on medication, diet and exercise, etc. is urged for helping the patients with self-management and for improving patient compliance."

Furthermore, this study seems ethically valid. According to Wang et al. (2017), "Clinical study protocol for this study was approved by the Ethics Committee of the First Hospital of Jilin University. And the study was carried out in accordance with the Declaration of Helsinki." Thus, one can conclude that all the 212 patients that participated in this study provided written informed consents. Based on the nature and outcome of this study, it appears that the study used valid and appropriate design. According to Portney & Watkins (2009), randomized controlled trial is the gold standard for true experimental designs. While one cannot ascertain the level of blinding use in this study, it is safe to infer that the data collection methods used in this study minimised the participants' bias. Likewise, the use of SPSS17.0. in their data analysis equally contributed to the validity of this study. However, these researchers did not provide any information on their source of funding, the role their funders played in this research and any conflict of interest statement.

This study has some positive clinical implications. For instance, it has ascertained the effectiveness and applicability of integrated remote management in treating diabetes. This could revolutionize both health care policies the management of chronic diseases not only in China, but worldwide. Finally, public health workers and educators now have an evidence-based alternative to the traditional method of working with individuals with type 2 diabetes, which will reduce stigma and treatment burdens associated with this illness.

Chen et al. (2012)

While randomized controlled trials are a superior research methodology in the hierarchy of evidence in therapy due to its ability limit the potential for any biases (Cantor & Evans, 2013), Chen and colleagues' systematic review offered a structured method to analyzing existing information to help clinicians make therapeutic decisions (Portney, 2009). Apart from the rigorous procedures that included searching, appraising and summarizing available information on cigarette smoking cessation, this study focused on the "effectiveness and cost-effectiveness of computer and other electronic aids for smoking cessation." From the onset of this study, Chen et al (2012) clearly stated their reasons for conducting this research. For instance, they posit that smoking is detrimental to health. In addition, they stated that normally, chronic "smokers lose 10 years of life, and about half of all lifelong smokers have their lives shortened by smoking." While these authors acknowledged the existence of smoking cessation services in the National Health Service (NHS), they alleged that these services achieve in consistent "success rates with smokers who want to stop smoking." This explains why they hypothesized that "approaches to behaviour change can be supplemented with electronic aids, and this may significantly increase quit rates and prevent a proportion of cases that relapse." Furthermore, using meta-analysis process allowed this study to use quantitative index to "develop a single overall estimate of intervention effect," which lends weight to the outcomes of this research (Portney & Watkins, 2009). The research methodology adopted in

this study indicates that adoption of proper ethical principles. However, one may not generalize the outcomes of this study to the younger population because the study was limited to “smoking cessation programmes in the adult population (Chen et al 2012).”

This study has several implications for clinical practice. For example, the result showed that the “pooled estimate for prolonged abstinence [relative risk (RR) = 1.32, 95% confidence interval (CI) 1.21 to 1.45] and point prevalence abstinence (RR = 1.14, 95% CI 1.07 to 1.22).” In this regard, it is plausible to conclude that computer and other electronic aids may increase the possibility of “cessation compared with no intervention or generic self-help materials (Chen et al., 2012).” This provided clinicians with another viable option to working with individuals with addiction challenges. In addition, EVPI calculations indicated that the maximum benefit of using this method to smoking cessation is around £ 2000-3000 per person (Chen et al., 2012),” which is enough to encourage public support for the use of this method in conjunction of other services in helping adult who want to quit smoking.

Kasckow et al. (2014)

These authors used systematic review research method to evaluate the forms and nature of remote medical treatments for patients with schizophrenia, either through telephone-based, internet-based or video-based telehealth systems. Like the rest four articles included in this critical appraisal, Kasckow and colleagues established plausible justification for engaging in this review. For instant, they posit that the limited “access to care among patients with schizophrenia can lead to treatment non-adherence, which usually leads to relapse, which in turn, increases the risk for inpatient hospitalization (Kasckow et al., 2014). Accordingly, they hypothesized that “telehealth communication services may offer one way to improve adherence and to enhance stability of treatment response in order to bridge the current gap in providing adequate care (Kasckow et al., 2014).” The researchers enhanced the validity of this study by assigning two of the researchers to independently code each article from the list to determine if it was suitable to the study. In addition, two of the authors worked together to decide which of the articles to select for final review. This approach to systematic review reduces researchers’ article selection bias. According to Portney and Watkins (2009), the traditional narrative literature reviews do not provide an in-depth description of the method and criteria used in the selection and evaluation of articles that are included in each study. However, the processes of conducting a systematic review are structured to be “inclusive of the body of research evidence at the time the review is undertaken (Portney & Watkins, 2009).” Furthermore, the authors used kappa (value) statistic to test for interrater reliability.

Conclusively, while the researchers underscored the need for more research on this subject, the research outcomes provided enough evidence for one to infer that tele-psychiatric systems may provide better healthcare for patients with schizophrenia through well-designed quality improvement programs. For instance, this study posits that telephone intervention improved patient-staff communication, medication adherence, insight, psychopathologic symptoms,

reduced patients' visits to the emergency room and hospitalization rates (Kasckow et al.,2014).

Interpretation of Results

The objective of this study was to investigate how the use of telemedicine may reduce the effect of stigma and the treatment burden in patients with health compromising lifestyles and chronic diseases? Given this study's definition of stigma or stigmatization, there is enough evidence from the five critically appraised articles to support the hypothesis that the use of telemedicine may reduce the effect of stigma and the treatment burden in patients with health compromising lifestyles and chronic diseases. While this study included articles that focused on elementary school children and obesity, others on diabetics, cancer support, smoking cessation (which is an example of a health-compromising lifestyle), and schizophrenia, one of the common themes in all the five articles included in this study is the assertion that any form of medical or social intervention whether through face to face or by distance is better than non-access to health and social care. Also, rural location (s) of the research subjects is another common feature of the five articles included in this study. In addition, most of the studies emphasised the importance of timely intervention in reducing the effects of stigmatization on patients. Further to the above evidence, is the fact that some of the appraised studies suggested that this approach to stigma reduction tend to be more effective in changing people's behaviour, which is one of the major factors for managing health compromising lifestyles and chronic diseases. This researcher noted that most of the studies in this appraisal pointed to the feasibility, cost effectiveness and the non-inferiority of telemedicine to the traditional face-to-face health and social care interventions. For example, Watson et al (2016) state that the provision of cognitive behavioral therapy to high need patients may be delivered based on the patient choice without loss of mental health benefit. This is because "both TAU-CBT and T-CBT are effective at reducing mental health problems on the definite outcome measures (Watson et al., 2016).

The interpretation of the outcome of this systematic review was based on inductive theory as all the data in this study have evolved through the process of inductive reasoning starting with empirically demonstrable evidence. According Portney & Watkins (2009), researchers can determine variables that are related to a given phenomenon through multiple studies and observations. Therefore, while most of the articles in this review indicated positive clinical outcomes for elementary school children and obesity, diabetics, cancer support, smoking cessation and mental health issues for individuals living in rural areas through the application of telemedicine, it is evident that this emerging thread or pattern has developed into a systematic conceptual basis, which has formed the basis for this study's assertion that use of telemedicine may reduce the effect of stigma and the treatment burden in patients with health compromising lifestyles and chronic diseases. This is because, positive clinical outcomes most times are the result of successful stigma interventions. For instance, Chen et al., (2012) posit that computer and other electronic aids may increase the possibility of "cessation

compared with no intervention or generic self-help materials". Similarly, Davis et al. (2013) conclude that telemedicine or the use of other interactive tele-video modalities encourages immediate access to care in that this approach to medical intervention reduce the time it takes families and health providers to travel from one location to the other (rural area to the medical centre or even from one's home to the care facility). In addition, the use of telemedicine may also facilitate access to highly trained specialists irrespective of the patient-physician's location (Davis et al., 2013).

Conclusion

This critical appraisal of peer-reviewed articles focused on how we may use telemedicine to reduce stigma and the treatment burden among patients with health compromising lifestyles and chronic diseases. This was motivated by the evidence that stigma related to health compromising lifestyles and chronic diseases is the main deterrent to early and effective intervention of health compromising habits and the treatment of chronic diseases.

All the appraised articles alluded to the effectiveness of telemedicine in curbing some of the treatment burdens of stigmatization for patients with health compromising lifestyles and chronic diseases. Furthermore, most of the appraised articles underscored the fact that any form of clinical intervention reduces the treatment burden of health compromising lifestyles and chronic illnesses as lack of access to medical information and treatment may negatively affect patients' health outcomes. However, it is evident that the use of other intervention methods such as government policy, public education and patient empowerment in conjunction with telemedicine would better reduce the effect of stigmatization and facilitate the medical interventions for patients with health compromising lifestyles and chronic diseases. Further studies that focus on the use of telemedicine in urban settings need to be conducted before the widespread promotion of this method of intervention as majority of the appraised studies focused on patients living in rural areas.

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