Examining the Use of Internet-Based Interventions Among Racial/Ethnic Minority Cancer Survivors: A Systematic Review

by

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Background

One emerging area of research is the use of Internet-based interventions among cancer survivors. Cancer survivors have a need for lifelong follow-up care and are more likely than the general population to seek information online (Claridy et al., 2018). Internet-based interventions have been proven to be helpful in providing emotional support and information to cancer survivors (Holmes, 2019). Another benefit that has been discovered through these interventions is weight management (Quintiliani et al., 2016). However, a prominent issue in this area is that racial/ethnic minorities have been underrepresented in research concerning Internet-based interventions. For example, only two percent of participants were Latinx in a study about internet-based health-information seeking (Claridy et al., 2018).

There are many potential reasons as to why minorities are underrepresented in this area of research. Recruitment and distrust are two possible reasons. However, there is research trying to close that gap by making interventions culturally appropriate and improve on trust-building among minorities. This is important because minorities may have distrust in healthcare providers and research (Natale-Pereira et al., 2011). Im et al. (2020) found that using multiple languages and having a culturally matched research team was important in recruiting minority cancer survivors. Im et al. (2016) emphasized the importance of having racially/ethnically matched research team members. Social media is another avenue that is being explored to recruit minorities. In particular, Facebook was effective in recruiting Latinx and East Asian cancer survivors (Tsai et al., 2019).

Digital inequality in regard to differences in Internet access has also been hypothesized as a reason behind the underrepresentation (Fogel et al., 2008). Fareed et al. (2020) found that

"cancer survivors, who use the Internet were younger, white, college educated, metro-dwelling, and more likely to report better self-rated health" (p. 92).

The lack of representation is concerning for many reasons. One reason is minority cancer survivors *do* want to be involved. In one online cancer survivorship program, Native Americans/Alaskan Natives enrolled in higher rates than white survivors (Yi et al., 2020). Another reason is that telehealth is emerging to be a potential solution toward addressing health care disparities (Abbott et al., 2017). Most importantly, minorities have worse cancer outcomes than white patients. According to the American Cancer Society (2019), Non-Hispanic Blacks had a "228.1" death rate from cancer compared to a "190.7" death rate in Non-Hispanic Whites (p. 2). Furthermore, American Indians/Alaska Natives have the highest death rates from kidney cancer (National Cancer Institute, 2020).

Thus, the purpose of this study is to examine the use of Internet-based interventions among minority cancer survivors.

Methodology

Search strategy:

A comprehensive search strategy was developed to identify all the studies relevant to our research question. The concept domains were racial/ethnic minorities and cancer survivors. The databases searched on November 12, 2020 were PubMed, Scopus, and ProQuest Search. No date limit was placed on this search. The search was not limited by research design. Search results were uploaded to Covidence. A combination of controlled vocabulary and key words were used to construct the search. The search strategy was initially constructed in PubMed and then subsequently mapped to the syntax of other databases. The complete search is provided in Appendix A. Duplicates were initially manually removed in EndNote and subsequently loaded

into Covidence, which identified additional duplicates not caught during the manual screening process in EndNote.

Screening and Data Extraction:

Two reviewers completed a two-stage screening process using Covidence, an online platform for conducting systematic reviews. In the first stage, reviewers independently screened all titles and abstracts of records that were potentially eligible and irrelevant records were excluded. Then, the full texts of remaining records were independently screened and assessed for inclusion by two reviewers. During both the title and abstract stage and the full text stage, conflicts were resolved by a third reviewer.

The following inclusion and exclusion criteria were used to determine the eligibility of the records.

Inclusion criteria:

Studies concerning racial and/or ethnic minorities, foci of support and/or education through Web-based or Internet or technology sources, and cancer survivors.

Exclusion criteria:

Studies aimed only on LGBTQ+ populations that focus on sexual minority and not racial minority. Studies focused on hospice care, palliative care, end of life, and mental health conditions.

A data extraction form was developed by the research team. Two reviewers extracted and organized the data into a table. The following data points were recorded for each of the included articles: citation/reference, study type, sample size, ethnicity or culture or race, type of intervention, how the intervention was used, and outcomes/findings.

Quality Assessment

The review team used the Mixed Methods Appraisal Tool (Hong et al., 2018) to assess the quality of each record. One reviewer completed the checklist for all records and another reviewer checked the assessments.

Results

The search produced a total of 1,170 records. After duplicates (n=320) were removed, 850 records remained. During the title and abstract screening, 775 records were determined as irrelevant based on inclusion and exclusion criteria. 62 records fit the criteria and 39 were questionable, where a third reviewer determined the discrepancies. In total, 75 records underwent the full text review. After that stage, 17 records met all eligibility criteria and were included in the review.

A Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flowchart is presented (Figure 1).

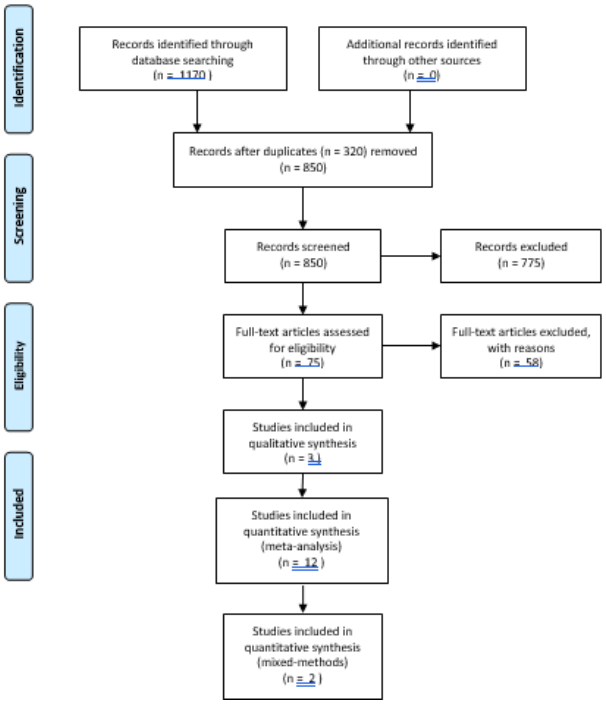

Figure 1

Characteristics of Included Studies

The 17 records consisted of a variety of study designs: two mixed methods, three qualitative, and 12 quantitative.

It is important to note the race/ethnicity of the records. The most prominent race/ethnicity described in the records were Black/African American (n=7). The second most prominent race/ethnicity was Latina/Hispanic (n=6). Then, three records focused on Asian American, one article focused on Chinese American, and one article focused on American Indian and Alaska Native.

The types of Internet-based interventions varied among records. The most prevalent was smartphone/mHealth/mobile app (n=8). The second most prevalent was online/Web-based/Internet (n=5). Technology-based (n=2), telehealth (n=1), and email (n=1) were also included. As technology has evolved, the delivery systems for Internet-based interventions have changed. The majority of these studies (n=11) were published in 2019 and 2020, reflecting an increase in technology for the delivery of healthcare. For example, Fareed et al. (2020) found that Internet use among cancer survivors increased from “49.5%" in 2003 to “76.9%” in 2017 (p. 92). In one study, only 9.2% of Chinese American breast cancer survivor participants used email or a website to get information from a doctor (Yi & Zahn, 2010). However, the study was conducted in 2010 and Internet use has grown significantly since then.

The interventions were designed to help minority cancer survivors in several ways. A prevalent use was the reduction of symptom burden and improvement of quality of life (QOL), as four interventions centered on that topic. One technology-based intervention was helpful in decreasing menopausal symptoms in Asian American breast cancer survivors (Im et al., 2019). A smartphone app decreased symptom burden in Latina breast cancer survivors and participants

were satisfied with the intervention (Yanez et al., 2020). One app aimed to improve the health related QOL for Hispanic breast cancer survivors, however, the improvements were not statistically significant (Buscemi et al., 2019). Another app focused on improving QOL among African American breast cancer survivors and participants found it to be culturally sensitive (Owens et al., 2020).

Another prevalent topic was a focus on support care and survivorship needs. One online program proved to be helpful in meeting the needs of young African American breast cancer survivors and participants found it to be culturally appropriate (Johnson-Tubes et al., 2015). An app was useful in improving the survivorship needs of Latina breast cancer survivors, such as digestion and sleep (Napoles et al., 2019). A technology-based intervention was helpful in reducing the support care needs of Asian American breast cancer survivors (Chee et al., 2020). Another intervention focused on communication needs and differences. One web-based intervention discovered that Black breast cancer survivors were less likely than the white participants to have their informational needs met by their healthcare providers (Anderson et al., 2020).

Three interventions were used to improve physical activity and diet behaviors. One app was helpful with improving the physical activity of African American breast cancer survivors and was accepted among participants (Allicock et al., 2020). Similarly, an email intervention was helpful in improving vigorous activity and decreasing sedentary time in African American and Hispanic breast cancer survivors (Paxton et al., 2017). Another app helped to decreased fat consumption and increase walking time in Latina breast cancer survivors (Buscemi et al., 2020).

Comparably, two different interventions focused on weight loss. One website/mobile app and wireless scale intervention helped African American breast cancer survivors lose weight and

participants responded positively to the program (Valle et al., 2017). Another app was also useful in decreasing weight and BMI in African American breast cancer survivors (Ferrante et al., 2020).

Two interventions focused on cancer support groups. One telehealth intervention was used to facilitate support groups among American Indian and Alaska Native cancer survivors and participants were satisfied with the intervention (Doorenbos et al., 2010). An Internet cancer support group proved to be helpful in decreasing uncertainty in Asian American breast cancer survivors (Chee et al., 2017).

Only one intervention focused on cancer clinical trials. A web-based intervention improved knowledge and decision readiness about clinical trials among Black and Hispanic cancer survivors. However, there were no differences among race/ethnicity (Langford et al., 2020).

Based on the studies in this review, minority cancer survivors use Internet-based interventions to reduce symptom burden, meet support care needs, improve physical activity and diet, lose weight, join cancer support groups, and learn information about clinical trials.

Discussion

To our knowledge, this paper is the first systematic review on minority cancer survivors' use of Internet-based interventions.

Several interventions were used by minority cancer survivors for reduction of symptom burden. It is important that minority cancer survivors have tools to help them manage symptoms, such as fatigue and sleep disturbances. Health care providers may not be explaining these symptoms and how to manage them. For example, in one telephone intervention for Latina breast

cancer survivors, participants "learned for the first time" about the extent and severity of fatigue after treatment (Meneses et al., 2018, p. 5).

It is interesting to note that African American breast cancer survivors used Internet-based interventions for weight loss and management. Quintiliani et al. (2016) suggested that future mHealth interventions for minority breast cancer survivors incorporate more personal components in addition to the technology, such as behavioral counseling. Future interventions might also focus on being culturally tailored. For example, Frencher et al. (2016) found that a culturally tailored decision support instrument increased knowledge about prostate cancer screening in Black men.

E-health literacy may be a barrier to participation in these interventions. Zhou & Wang (2020) discovered that cancer survivors who were either female or had a higher education level had higher e-health literacy levels. Another barrier to participation may be that most interventions are only available in English (Yi & Zahn, 2010). An important barrier to participation could also be distrust in healthcare and research. Black and Hispanic patients have a significantly higher distrust of physicians than white patients (Armstrong et al., 2007).

Limitations

It is recommended that two or more reviewers complete the quality assessment of included studies. However, this paper is an undergraduate student project, so only one reviewer completed the checklist.

Most of our studies focused on African American and Latina breast cancer survivors. It is important that interventions target these populations because African American women have a "41%" higher death rate from breast cancer than white women (American Cancer Society, 2019, p. 9) and breast cancer is the leading cause of cancer death among Latina women (American

Cancer Society, 2018). This review revealed very few studies with minorities outside of African American and Latinx populations. Further research should focus on the use of Internet-based interventions among other races/ethnicities such as American Indian/Alaska Native and Asian American.

Furthermore, the majority of our sample focused on women. Future research should include minority males. This is important because Black/African American men are more likely to die from prostate cancer than white men (National Cancer Institute, 2020).

Conclusion

This review examined the use of Internet-based interventions among minority cancer survivors and discovered seventeen studies. It is evident that these interventions are helpful in several ways, however, minorities are not equally represented. We suggest that future interventions and research focus on the inclusion of minorities. Future interventions could accomplish this by creating more culturally tailored programs and having them available in several languages. Future research might also focus on improving trust and increasing technology access.

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Appendix A

PubMed Search - Completed on Nov 12, 2020, produced 142 results:

((("Minority Groups"[Mesh] OR "Hispanic Americans"[Mesh] "Ethnic Groups"[Mesh] OR "African Americans"[Mesh] OR "Asian Americans"[Mesh] OR "Indians, North American"[Mesh] OR "Alaska Natives"[Mesh] OR "Oceanic Ancestry Group"[Mesh] OR "Mexican Americans"[Mesh] OR "Ethnic Groups"[Mesh] OR Latino[tiab] OR Latinos[tiab] OR Latinas[tiab] OR Latina[tiab] OR Latinx[tiab] OR Hispanic[tiab] OR Hispanics[tiab] OR "Mexican Americans"[tiab] OR Chicana [tiab] OR Chicanas[tiab] OR Chicano[tiab] OR Chicanos[tiab] OR Black[tiab] OR Blacks[tiab] OR "Black American"[tiab] OR "Black Americans"[tiab] OR "African American"[tiab] OR "African Americans"[tiab] OR "African-American"[tiab] OR "African-Americans"[tiab] OR Asian[tiab] OR Asians[tiab] OR "Asian American"[tiab] OR "Asian Americans"[tiab] OR Arab[tiab] OR Arabs[tiab] OR "Arab American"[tiab] OR "Arab Americans"[tiab] OR Indian[tiab] OR Indians[tiab] OR "American Indian"[tiab] "American Indians"[tiab] OR "Indigenous American"[tiab] OR "Indigenous Americans"[tiab] OR "Alaska Native"[tiab] OR "Alaska Natives"[tiab] OR "Pacific Islander"[tiab] OR "Pacific Islanders"[tiab] OR "Mexican American"[tiab] OR "Mexican Americans"[tiab] OR "Native Hawaiian"[tiab] OR "Native Hawaiians"[tiab] OR "Puerto Rican American"[tiab] OR "Puerto Rican Americans"[tiab] OR Chinese[tiab] OR "Chinese Americans"[tiab] OR Korean[tiab] OR Koreans[tiab] OR "Korean Americans"[tiab] OR "Racially Diverse"[tiab] OR Ethnic[tiab] OR Ethnicity[tiab] OR Ethnicities[tiab] OR "ethnic minority" [tiab] OR "ethnic minorities"[tiab] OR minority[tiab] OR minorities[tiab] OR "minority group"[tiab] OR "minority groups"[tiab]) AND (("Cancer Survivors"[Mesh] OR "Survivors"[Mesh] OR "Survivorship"[Mesh] OR "Neoplasms/ethnology"[Mesh] OR (cancer[tiab] OR neoplasms[tiab] OR malignant[tiab]) AND (survivor[tiab] OR survivors[tiab] OR survivorship[tiab])))) AND ("Social Media"[Mesh] OR "Cell Phone"[Mesh] OR "Mobile Applications"[Mesh] OR "Internet-Based Intervention"[Mesh] OR "Internet"[Mesh] OR "Self-Help Groups"[Mesh] OR Twitter[tiab] OR Facebook[tiab] OR Instagram[tiab] OR Reddit[tiab] OR "social media"[tiab] OR "mobile app"[tiab] OR "mobile apps"[tiab] OR "electronic app"[tiab] OR "electronic apps"[tiab] OR "software app"[tiab] OR "software apps"[tiab] OR "web-based"[tiab] OR "web based"[tiab] OR Online[tiab] OR Internet[tiab] OR MHealth[tiab] OR "mobile health"[tiab] OR "m-health"[tiab] OR EHealth[tiab] OR ehealth[tiab] OR "E-health"[tiab] OR "support group"[tiab] OR "support groups"[tiab] OR Media[tiab] OR telehealth[tiab] OR "digital technology"[tiab] OR "digital technologies"[tiab] OR "mobile applications"[tiab] OR "mobile application"[tiab])

Scopus Search, done on November 11, 2020, produced 593 results:

TITLE-ABS-KEY
(latino OR latinos OR latinas OR latina OR latinx OR hispanic OR hispanics OR "Mexi can
Americans" OR chicana OR chicanas OR chicano OR chicanos OR black OR blacks OR "Black American" OR "Black Americans" OR "African American" OR "African Americans" OR "African-American" OR "African-
Americans" OR asian OR asians OR "Asian American" OR "Asian
Americans" OR arab OR arabs OR "Arab American" OR "Arab
Americans" OR indian OR indians OR "American Indian" OR "American
Indians" OR "Indigenous American" OR "Indigenous Americans" OR "Alaska

Native" OR "Alaska Natives" OR "Pacific Islander" OR "Pacific Islanders" OR "Mexican American" OR "Mexican Americans" OR "Native Hawaiian" OR "Native Hawaiians" OR "Puerto Rican American" OR "Puerto Rican Americans" OR chinese OR "Chinese Americans" OR korean OR koreans OR "Korean Americans" OR "Racially Diverse" OR ethnic OR ethnicity OR ethnicities OR "ethnic minority" OR "ethnic minorities" OR minority OR minorities OR "minority group" OR "minority groups")) AND (TITLE-ABS-KEY ((cancer OR neoplasms OR malignant) AND (survivor OR survivors OR survivorship))) AND (TITLE-ABS-KEY (twitter OR facebook OR instagram OR reddit OR "social media" OR "mobile app" OR "mobile apps" OR "mobile applications" OR "mobile application" OR "electronic app" OR "electronic apps" OR "software app" OR "software apps" OR "web-based" OR "web based" OR online OR internet OR mhealth OR "mobile health" OR "m-health" OR ehealth OR ehealth OR "E-health" OR media OR "telehealth" OR "support group" OR "support groups" OR "digital technology" OR "digital technologies"))

Proquest Search, Completed on November 12, 2020, initially produced 1,963 results, Then limited by "Source Type": Scholarly Journals, Dissertations & Theses, Conference Papers & proceedings, & Working Papers) = 435 results

noft(Latino OR Latinos OR Latinas OR Latina OR Latinx OR Hispanic OR Hispanics OR "Mexican Americans" OR Chicana OR Chicanas OR Chicano OR Chicanos OR Black OR Blacks OR "Black American" OR "Black Americans" OR "African American" OR "African Americans" OR "African-American" OR "African-Americans" OR Asian OR Asians OR "Asian American" OR "Asian Americans" OR Arab OR Arabs OR "Arab American" OR "Arab Americans" OR Indian OR Indians OR "American Indian" OR "American Indians" OR "Indigenous American" OR "Indigenous Americans" OR "Alaska Native" OR "Alaska Natives" OR "Pacific Islander" OR "Pacific Islanders" OR "Mexican American" OR "Mexican Americans" OR "Native Hawaiian" OR "Native Hawaiians" OR "Puerto Rican American" OR "Puerto Rican Americans" OR Chinese OR "Chinese Americans" OR Korean OR Koreans OR "Korean Americans" OR "Racially Diverse" OR Ethnic OR Ethnicity OR Ethnicities OR "ethnic minority" OR "ethnic minorities" OR minority OR Minorities OR "minority group" OR "minority groups") AND noft((cancer OR neoplasms OR malignant) AND (survivor OR survivors OR survivorship)) AND noft(Twitter OR Facebook OR Instagram OR Reddit OR “social media” OR “mobile app” OR “mobile apps” OR “mobile applications” OR “mobile application” OR “electronic app” OR “electronic apps” OR “software app” OR “software apps” OR “web-based” OR “web based” OR Online OR Internet OR MHealth OR “mobile health” OR “m-health” OR EHealth OR ehealth OR “E-health” OR Media OR “telehealth” OR “support group” OR “support groups” OR “digital technology” OR “digital technologies”)

Total References once combined & after removing duplicates in Endnote & uploaded into Covidence = 850 results.