Medical
Communication

BBRC
Bioscience Biotechnology
Research Communications

Biosc.Biotech.Res.Comm. Vol 14 No (1) Jan-Feb-March 2021 Pp 435-440

Scientometrics of the Emerging Trends in Nursing Research Related to Perceived Needs of Breast Cancer Survivors

Shankar Shanmugam Rajendran[1], Pradeep Kumar Naik[2] and Serma Subathra Arunachalam[3]
[1]*College of Nursing, Madras Medical College, Chennai, Tamil Nadu, India*
[2]*Department of Biotechnology and Bioinformatics, Sambalpur University, Odisha, India*
[3]*College of Nursing, All India Institute of Medical Science, Bhubaneshwar, Odisha, India*

ABSTRACT

As a critical point to promote breast cancer survivors' health care, the perceived needs are inevitable to this scenario. The purpose of this analysis is to provide a dynamic and longitudinal Scientometric study of the perceived needs of breast cancer survivors on nursing research. The Web of Science (WoS) Core Collection was searched to retrieve all existing and highly cited perceived needs research papers published in English between 1991 and November 2020. Based on the bibliometric indicators, the growth rate of publications, countries, and institutions was engaged on research, characteristics of research activities, keyword analysis, document co-citation analysis (DCA) for research hotspot tendencies were computed using the CiteSpace Software. The search identified 898 articles, which were included in the analysis. The United States (501; 55.791%) and the National Cancer Institute (NCI; 38) were the most productive and active research conducting in this knowledge domain. The United States also produced more than half of the publication in the last 30 years on the part of perceived needs. Cluster-based analysis of document co-citation analysis (DCA) was conducted to know the emerged trends in this domain. This bibliometric analysis concludes that (1) internet-based health-related information; (2) quality care of cancer patients; (3) breast cancer patient-physician relationships; (4) experience of psychosocial and physical needs after oncological treatment; and (5) eHealth system, which are found the major nursing research trends on this domain. This finding helps researchers, policymakers, and practitioners better understand the current trends in breast cancer survivors' perceived needs.

KEY WORDS: BREAST CANCER SURVIVORS, INFORMATION NEEDS, NURSING RESEARCH, PERCEIVED NEEDS, SCIENTOMETRIC ANALYSIS.

INTRODUCTION

The self-perception of health among patients and caregivers with chronic diseases had changed drastically in recent times. Notably, in breast cancer, both the woman and her partner affects in different ways. The high prevalence of this chronic disease combined with psychiatric morbidity leads to various psychosocial impacts on the patient's life. Specifically, isolation, depression and anxiety, and lack of social support, which are all not only worsen the quality of life but also reduces the possibilities of the treatment outcome.

Even though various psychosocial interventions help overcome the psychiatric symptoms of breast cancer survivors, very few studies have focused on perceived needs from patients' and caregivers' perspectives. Without understanding the perceived needs, helping breast cancer

Article Information:
*Corresponding Author: *shankarshaki@yahoo.com*
Received 13/12/2020 Accepted after revision 25/03/2021
P-ISSN: 0974-6455 E-ISSN: 2321-4007
Thomson Reuters ISI Clarivate Analytics
Web of Science ESCI Indexed Journal

Identifiers & Pagination:
Vol 14(1) E-Pub 31st Mar 2021 Pp 435-440

Published by Society for Science & Nature India
DOI: http://dx.doi.org/10.21786/bbrc/14.1/62

patients and caregivers have become more critical. To increase the rate of survival and quality of life, perceived needs play a significant role in breast cancer survivors. It helps to understand the gap between survivors' experiences and expectations (Spiegel, 1996; Macleduff et al., 2004; Burgess et al., 2005; Boyes, et al., 2009; Melvin et al., 2016, Mishra and Saranath, 2019; Kern et al., 2019 and Shen et al., 2020).

Self-perception of survivors' needs and issues remains unachieved but expected to experience, which are considered essential factors underlying to measure cancer survivors' perceived needs. Based on this, five significant factors had identified and included to measure perceived needs such as psychological needs, health system and information needs, physical and daily living needs, patient care, and support needs and issues with sexuality (Boyes, et al., 2009). The domains specifically focused on emotions and coping of survivors (Lebel et al., 2009). Followed by, needs related to treatment center including information in regards to disease severity, diagnosis, treatment and follow-up (Melvin et al., 2016).

Furthermore, coping on physical symptoms, side effects of treatment and performing routine daily activities, health care providers and importance given to sensitivity to physical and emotional needs, and privacy, finally, the sexuality domain focused on needs connected with sexual relationships (Rietman et al., 2003; Boyes et al., 2009; Mao et al., 2013; Yoo et al., 2014; Fang et al., 2015; Crowley et al., 2016; Fong et al., 2017). Although these domains were playing a vital role in perceived needs, the emerging trends in this field, and the key contributors of this area are not known from any nursing research studies. Hence, to get a solution to these research questions, conducting a Scientometric analysis is inevitable to the present scenario with CiteSpace software's help (Chen, 2017).

MATERIAL AND METHODS

For the data sources, scientometric articles were collected from advanced search in the WoS Core collection (Web of Science) incorporating with Science Citation Index Expanded (SCI-E), Social Science Citation Index (SSCI), and Arts and Humanities Citation Index (AandHCI). All the articles were written in English, only taken for analysis. The dataset was collected through the strategies; TS= ("breast cancer survivors" AND "perceived needs") or ("breast cancer" AND "health information") or ("breast cancer survivors" AND "daily living") or ("breast cancer" AND "patient care support") or ("breast cancer" AND "interpersonal communication") or ("breast cancer" AND "nursing care")) that articles with those words in the title or abstract, or keywords were retrieved. The period was taken between 1991 and 2020* (*-November 2020). 898 articles in total were retrieved from more than 50 Web of Science categories and the top five categories as 'Oncology' (281), followed by 'Public environmental occupational health' (205), 'Nursing' (153), 'Health care sciences services' (141), and 'Communication' (77).

For the software, CreateSpace was used, as developed by Chen (Chen, 2004; Chen, 2017), to analyze and visualize the Scientometric properties from the retrieved documents. Co-citation analysis network containing authors, countries, document references, and institutions as well as it helps to find the research patterns and detects the research core spots in the knowledge domain of perceived needs among breast cancer survivors.

RESULTS AND DISCUSSION

Publication years: Until 2000, a minimal number of articles were only published in this field. Significantly, in 1991, no paper was published related to perceived needs among cancer survivors or breast cancer survivors. In 1992, there were only two articles published related to this area. And the subsequent year, only one article was published. After 2001, the number of publications was increased gradually. In 2019, the highest publication was recorded (72). Annual research publications are illustrated in Figure 1. The findings show that the continued growth of publications on perceived needs was noticed.

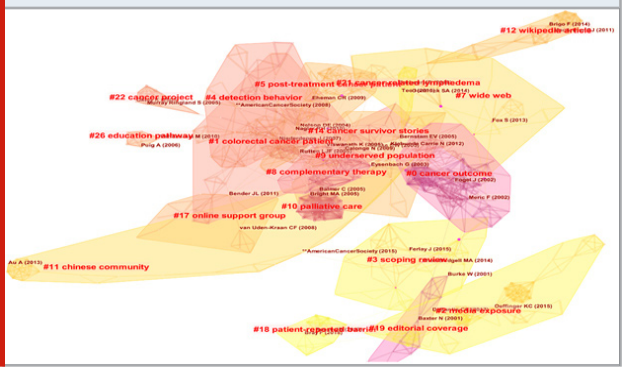
Figure 1: The number of annual publication on perceived needs of breast cancer survivors

Countries distribution: Among the published articles, the top 10 most productive countries were ordered based on publication production and their percentage such as USA (501; 55.791%), followed by England (71; 7.906%), Canada (63; 7.016%), Australia (54; 6.013%), Peoples R China (42; 4.667%), South Korea (24; 2.673%), Netherlands (19; 2.116%), Turkey (19; 2.116%), Sweden (18; 2.004%) and Brazil (17; 1.893%). Within these records, India (1; 0.111%) was published only an article in the Web of Science during the period of 1991 to 2020. Besides, more than half of the records were published only in the United States shows that this country plays a crucial role in publishing more records regarding the perceived needs of breast cancer survivors.

Institutions / Organizations: The top 10 institutions based on the number of publications related to perceived needs among breast cancer survivors were listed. It is worth noting that the National Cancer Institute (NCI) ranked first in total publications (38). Harvard University ranked as the second on in this list (28), followed by University of Michigan (26), University of Pennsylvania (24), University of Wisconsin (21), Memorial Sloan Kettering

Cancer Center (19), University of North Carolina (18), University of Toronto (17), University of Illinois (16) and Dana-Farber Cancer Institute (15). All of the top 10 institutions were from the United States only. Hence, the United States playing prepotency in researching with perceived needs among cancer survivors.

Figure 2: Scientometric mapping of document co-citation analysis (DCA) based on clusters with data derived from WoS between 1991 to 2020



Authors distribution: Based on the publication records on perceived needs published uniquely by the authors, the top five authors were listed and author Gustafson, DH (11) as the first, followed by Moser, RP (9), Pingree, S (9), Klein, WMP (7) and Li, XM (7).

Keyword distribution: By using CiteSpace analyzing software, based on citation burst, the keywords viz., 'world wide web' (10.07), 'health literacy' (5.80), 'quality' (5.77), 'chemotherapy' (5.39), and 'symptom' (4.82) were the top five keywords used popularly and recently emerged. It shows that around these keywords, particularly, 'world wide web' (10.07) as the most robust citation burst on cancer survivors' perceived needs.

Document co-citation analysis (DCA): The 898 records from 1991 to 2020 were visualized, and a one-year time slice was selected for analysis. Cluster-based analysis of document co-citation analysis (DCA) was illustrated in Figure 2. The top fifty most cited articles in each year were chosen for the Scientometric study and summarized in table 1 with the top five clusters within that top five cited references of cancer survivors' perceived needs.

Table 1. The five largest DCA clusters on perceived needs with top 5 most cited references DOI

Cluster #	Cluster Size	Silhouette Value	Mean (Year)	cc	Burst	σ	ΣTop 5 Most Cited references DOI
Cancer outcome	83	0.910	2002	14	6.66	0.00	1.0110.1037/0278-6133.21.4.398
				12	5.70	0.00	1.0110.1001/jama.285.20.2612
				12	4.92	0.00	1.0010.1136/bmj.324.7337.577
				11	4.46	0.01	1.0310.1136/bmj.324.7337.573
				10	4.27	0.06	1.2610.1136/bmj.328.7439.564
Colorectal cancer patient	65	0.892	2006	11	4.36	0.06	1.3110.1016/j.pec.2004.06.006
				7	4.00	0.02	1.0810.1080/10410230701454189
				6	-	0.24	1.0010.2196/jmir.1035
				6	-	0.04	1.00 -
				6	3.46	0.03	1.1010.1002/cncr.23445
Media exposure	54	0.998	2015	5	-	0.08	1.0010.3322/caac.21412
				5	-	0.07	1.0010.1001/jama.2015.12783
				4	-	0.00	1.0010.3322/caac.21349
				4	-	0.04	1.0010.2196/jmir.5729
				4	-	0.00	1.0010.3322/caac.21387
Scoping Review	43	0.944	2015	8	4.05	0.01	1.0610.1002/ijc.29210
				8	4.05	0.15	1.7510.3747/co.21.1932
				4	-	0.14	1.0010.1002/cncr.28951
				4	-	0.00	1.0010.1016/j.breast.2017.10.004
				4	-	0.03	1.0010.1002/cncr.28737
Detection behavior	37	0.914	2006	18	8.55	0.04	1.4010.1080/10810730490504233
				4	-	0.01	1.0010.7326/0003-4819-144-8-200604180-00004
				4	-	0.02	1.0010.1111/j.1460-2466.2008.00383.x
				4	-	0.00	1.0010.1146/annurev.clinpsy.3.022806.091428
				4	-	0.02	1.00 -

Source: The data were derived from analysis of document co-citation network using dataset retrieved from WoS. CC-Citation-count, σ-Centrality, Σ-Sigma.

The top five clusters based on cluster size are Cancer Outcome (83), Colorectal cancer patient (65), Media exposure (54), Scoping review (43), and Detection behavior (37). Each cluster was labeled by the method of log-likelihood ratio. The range of silhouette value of the first five largest clusters is between 0.910 and 0.998. It represents each cluster as different from one another and has a high homogeneity level for each cluster. The mean year of each cluster is 2002, 2006, 2015, 2015 and 2006 respectively. The clusters, both Media exposure, and Scoping review are very recently emerged.

The most-cited references of Cancer Outcome based on citation count and burst strength as Fogel, J_2002 (14; 6.66), followed by, Berland, GK_2001 (12; 5.70), Meric, F_2002 (12; 4.92), Eysenbach, G_2002 (11; 4.46), and Ziebland, S_2004 (10; 4.27). This cluster article mainly focused on how the internet plays a crucial role in health related information. In this digital world, most patients try to search for health-related information with the internet's help. Therefore, wide people depend more on the internet.

Eysenbach and Kohler first conducted observational study to investigate the retrieval strategies of people searching for health information on the website (Eysenbach and Köhler, 2002). Further, another study revealed that internet use for breast health issues was highly associated with greater social support and the survivors felt less loneliness (Fogel et al., 2002). "The impact of the internet on cancer outcomes" is the most active citer article on this cluster (Eysenbach, 2003).

The second-largest cluster as Colorectal cancer patient (65) labeled by the method of log-likelihood ratio. The top five most cited references as Rutten, LJF_2005 (11; 4.36), Niederdeppe, J_2007 (7; 4.00), Atkinson, NL_2009 (6), American cancer society_2007 (6), and Hesse, BK_2008 (6; 3.46). This cluster mainly focused on ensuring quality care of cancer patients. The most active citer article as "Differences in information seeking among breast, prostate, and colorectal cancer patients: results from a population-based survey" (Nagler et al., 2010; Tan and Goonawardene, 2017).

Further, the third cluster is Media exposure (54), and the top five most-cited authors as DeSantis, CE_2017 (5), Oeffinger, KC_2015 (5), Miller, KD_2016 (4), Tan, SSL_2017 (4) and Siegel, RL_2017 (4). This cluster mainly focused on reviewing breast cancer screening guidelines, patient-physician relationship (Tan and Goonawardene, 2017), and reviewing most recent data on cancer incidence, mortality, and survival (Siegel, Miller and Jemal, 2017). The most active citer article in this cluster is "Effects of media exposure to conflicting information about mammography: results from a population-based survey experiment" (Nagler, et al., 2019).

The fourth cluster is labeled as Scoping review (43), and the mean year of this cluster is 2015. The top five cited authors as Ferlay, J_2015 (8; 4.05), followed by, Shea-Budgell, MA_2014 (8; 4.05), Burg, MA_2015 (4), Arif, N_2018 (4), and Champion, VL_2014 (4). This cluster reference articles concentrate on the experience of psychosocial and physical needs related to cancer experience after their treatment (Burg et al., 2015), also focused on better prevention approaches and clinical responses. The article "A scoping review of consumer needs for cancer information" as the most citer active article on this cluster (Jo, et al., 2019).

And finally, the fifth cluster is labeled as Detection behavior (37). The top five most-cited references are Nelson, DE_2004 (18; 8.55), followed by, Smith-Bindman, R_2006 (4), Gustafson, DH_2008 (4), Strecher, V_2007 (4) and American Cancer Society_2008 (4). This cluster concentrates on cancer-related information, eHealth system, that provides integrated information, support, and bioinformatics and deliver behavioral and health-related interventions through the internet (Strecher, 2007; Gustafson et al., 2008). The most active citer to the cluster is "Topics and sources of memorable breast cancer messages and their impact on prevention and detection behaviors and a cluster-randomized trial of a primary care informatics-based system for breast cancer screening" (Smith et al., 2009; Atlas et al., 2011).

CONCLUSION

The present study aimed to provide a bird's-eye view of the entirety of cancer survivors' perceived needs. This analysis depicted trends on perceived needs among breast cancer survivors; (1) internet's role on health-related information; (2) ensuring quality care of cancer patients; (3) patient-physician relationships; (4) experience of psychosocial and physical needs related to cancer experience after treatment; and (5) eHealth system. However, there are minimal studies found in the developing countries in sexuality among cancer survivors, relationship between cancer survivors and partners, and caregiver's perspective on the partner. Future research should be dedicated to filling the gap in this domain.

ACKNOWLEDGEMENTS

This work was not supported by any funding agency.

Conflict of Interest: There were no conflicts among the interests of the participating authors.

REFERENCES

Atlas, S. J., Grant, R. W., Lester, W. T., Ashburner, J. M., Chang, Y., Barry, M. J., and Chueh, H. C. (2011). A cluster-randomized trial of a primary care informatics-based system for breast cancer screening. Journal of general internal medicine, 26(2), 154-161.

Boyes, A., Girgis, A., and Lecathelinais, C. (2009). Brief assessment of adult cancer patients perceived needs: development and validation of the 34-item Supportive Care Needs Survey (SCNS-SF34). Journal of evaluation in clinical practice, 15(4), 602-606.

Burg, M. A., Adorno, G., Lopez, E. D., Loerzel, V., Stein, K., Wallace, C., and Sharma, D. K. B. (2015). Current unmet needs of cancer survivors: Analysis of open-ended responses to the A merican C ancer S ociety S tudy of C ancer S urvivors II. Cancer, 121(4), 623-630.

Burgess, C., Cornelius, V., Love, S., Graham, J., Richards, M., and Ramirez, A. (2005). Depression and anxiety in women with early breast cancer: five-year observational cohort study. Bmj, 330(7493), 702.

Chen, C. (2004). Searching for intellectual turning points: Progressive knowledge domain visualization. Proceedings of the National Academy of Sciences, 101(suppl 1), 5303-5310.

Chen, C. (2017). Science mapping: a systematic review of the literature. Journal of Data and Information Science, 2(2), 1-40.

Crowley, S. A., Foley, S. M., Wittmann, D., Jagielski, C. H., Dunn, R. L., Clark, P. M., and Wei, J. T. (2016). Sexual health concerns among cancer survivors: testing a novel information-need measure among breast and prostate cancer patients. Journal of Cancer Education, 31(3), 588-594.

Eysenbach, G. (2003). The impact of the Internet on cancer outcomes. CA: A cancer journal for clinicians, 53(6), 356-371.

Eysenbach, G., and Köhler, C. (2002). How do consumers search for and appraise health information on the world wide web? Qualitative study using focus groups, usability tests, and in-depth interviews. Bmj, 324(7337), 573-577.

Fang, S. Y., Lin, Y. C., Chen, T. C., and Lin, C. Y. (2015). Impact of marital coping on the relationship between body image and sexuality among breast cancer survivors. Supportive Care in Cancer, 23(9), 2551-2559.

Fogel, J., Albert, S. M., Schnabel, F., Ditkoff, B. A., and Neugut, A. I. (2002). Internet use and social support in women with breast cancer. Health Psychology, 21(4), 398.

Fong, A. J., Scarapicchia, T. M., McDonough, M. H., Wrosch, C., and Sabiston, C. M. (2017). Changes in social support predict emotional well-being in breast cancer survivors. Psycho-oncology, 26(5), 664-671.

Gustafson, D. H., Hawkins, R., McTavish, F., Pingree, S., Chen, W. C., Volrathongchai, K., and Serlin, R. C. (2008). Internet-based interactive support for cancer patients: are integrated systems better? Journal of Communication, 58(2), 238-257.

Jo, H. S., Park, K., and Jung, S. M. (2019). A scoping review of consumer needs for cancer information. Patient education and counseling, 102(7), 1237-1250.

Kern, D., Busch, A., Schneider, K. L., Miller, S. A., Appelhans, B. M., Waring, M. E., and Pagoto, S. (2019). Psychosocial factors associated with treatment outcomes in women with obesity and major depressive disorder who received behavioral activation for depression. Journal of behavioral medicine, 42(3), 522-533.

Kissane, D. W., Grabsch, B., Love, A., Clarke, D. M., Bloch, S., and Smith, G. C. (2004). Psychiatric disorder in women with early stage and advanced breast cancer: a comparative analysis. Australian and New Zealand Journal of Psychiatry, 38(5), 320-326.

Lebel, S., Rosberger, Z., Edgar, L., and Devins, G. M. (2009). Emotional distress impacts fear of the future among breast cancer survivors not the reverse. Journal of Cancer Survivorship, 3(2), 117-127.

Mao, J. J., Chung, A., Benton, A., Hill, S., Ungar, L., Leonard, C. E., and Holmes, J. H. (2013). Online discussion of drug side effects and discontinuation among breast cancer survivors. Pharmacoepidemiology and drug safety, 22(3), 256-262.

McElduff, P., Boyes, A., Zucca, A., and Girgis, A. (2004). Supportive Care Needs Survey: A guide to administration, scoring and analysis. Newcastle: Centre for Health Research and Psycho-oncology.

Melvin, J. C., Wulaningsih, W., Hana, Z., Purushotham, A. D., Pinder, S. E., Fentiman, I., and Van Hemelrijck, M. (2016). Family history of breast cancer and its association with disease severity and mortality. Cancer medicine, 5(5), 942-949.

Mishra, V. S., and Saranath, D. (2019). Association between demographic features and perceived social support in the mental adjustment to breast cancer. Psycho-oncology, 28(3), 629-634.

Nagler, R. H., Gray, S. W., Romantan, A., Kelly, B. J., DeMichele, A., Armstrong, K., and Hornik, R. C. (2010). Differences in information seeking among breast, prostate, and colorectal cancer patients: results from a population-based survey. Patient education and counseling, 81, S54-S62.

Nagler, R. H., Yzer, M. C., and Rothman, A. J. (2019). Effects of media exposure to conflicting information about mammography: results from a population-based survey experiment. Annals of Behavioral Medicine, 53(10), 896-908.

Pilevarzadeh, M., Amirshahi, M., Afsargharehbagh, R., Rafiemanesh, H., Hashemi, S. M., and Balouchi, A. (2019). Global prevalence of depression among breast cancer patients: a systematic review and meta-analysis. Breast cancer research and treatment, 1-15.

Rebecca, S., Siegel, M., Kimberly, D., Miller, M. P. H., and Ahmedin Jemal, D. V. M. (2017). Cancer statistics. Ca Cancer J Clin, 67(27), 7-30.

Rietman, J. S., Dijkstra, P. U., Hoekstra, H. J., Eisma, W. H., Szabo, B. G., Groothoff, J. W., and Geertzen,

J. H. (2003). Late morbidity after treatment of breast cancer in relation to daily activities and quality of life: a systematic review. European Journal of Surgical Oncology (EJSO), 29(3), 229-238.

Shen, A., Qiang, W., Wang, Y., and Chen, Y. (2020). Quality of life among breast cancer survivors with triple negative breast cancer—role of hope, self-efficacy and social support. European Journal of Oncology Nursing, 101771.

Smith, S. W., Nazione, S., LaPlante, C., Kotowski, M. R., Atkin, C., Skubisz, C. M., and Stohl, C. (2009). Topics and sources of memorable breast cancer messages and their impact on prevention and detection behaviors. Journal of health communication, 14(3), 293-307.

Spiegel, D. (1996). Cancer and depression. The British Journal of Psychiatry, 168(S30), 109-116.

Strecher, V. (2007). Internet methods for delivering behavioral and health-related interventions (eHealth). Annu. Rev. Clin. Psychol., 3, 53-76.

Tan, S. S. L., and Goonawardene, N. (2017). Internet health information seeking and the patient-physician relationship: a systematic review. Journal of medical Internet research, 19(1), e9.

Yoo, G. J., Levine, E. G., and Pasick, R. (2014). Breast cancer and coping among women of color: a systematic review of the literature. Supportive Care in Cancer, 22(3), 811-824.