

Original Article

Knowledge, Attitude and Practice of Healthcare Professionals in Promoting Physical Rehabilitation Among Breast Cancer Patients

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ABSTRACT

Background: Breast cancer patients are at heightened risk for functional impairments due to disease and treatment, with physical rehabilitation shown to mitigate adverse outcomes. However, the extent of knowledge, attitudes, and practices (KAP) of healthcare professionals in promoting rehabilitation among these patients, particularly in low-resource settings, remains underexplored. Objective: To comprehensively assess the knowledge, attitudes, and practices of healthcare professionals regarding the promotion of physical rehabilitation among breast cancer patients in major cities of Pakistan. Methods: A cross-sectional study was conducted among 250 healthcare professionals directly involved in breast cancer care in Sialkot, Lahore, and Islamabad. Data were collected using a self-modified, validated questionnaire encompassing four domains: socio-demographics, knowledge, attitudes, and practices related to physical activity promotion. Descriptive and inferential statistics, including chi-square tests and odds ratios, were used for analysis (SPSS v26). Results: Most clinicians (94%) agreed that physical activity is safe during breast cancer treatment, and 90% reported confidence in providing PA advice. However, only 56% felt PA counseling was a core part of their role. Referral to physiotherapy was reported by 82.4% of clinicians, but only 7.6% had worked in interdisciplinary rehabilitation teams. Barriers to integration included limited access to PT services (40.8%), patient reluctance (28.8%), and systemic resource constraints. Experience was positively associated with both confidence and referral rates. Conclusion: While Pakistani healthcare professionals report strong knowledge and favorable attitudes regarding physical rehabilitation for breast cancer patients, systemic and resource barriers constrain optimal practice. Structured professional education and improved interdisciplinary collaboration are needed to bridge the gap between knowledge and implementation.

Keywords: Breast cancer, Physical rehabilitation, Healthcare professionals, Knowledge, Attitude, Practice, Pakistan

INTRODUCTION

Breast cancer is the most frequently diagnosed cancer among women globally, contributing significantly to cancer-related morbidity and mortality, with nearly 2.3 million new cases and 685,000 deaths reported worldwide in 2020 (1). The disease burden is particularly pronounced in low- and middle-income countries, such as Pakistan, where breast cancer incidence rates are among the highest in Asia and account for substantial public health challenges (2). The International Agency for Research on Cancer (IARC) reported that one in nine Pakistani women is at lifetime risk of developing breast cancer, and mortality rates remain disproportionately elevated (3).

Treatment regimens for breast cancer, including surgery, chemotherapy, radiation therapy, and hormonal therapies such as aromatase inhibitors, are associated with significant adverse musculoskeletal effects, including bone mineral density loss, muscle weakness, osteoporosis, and restricted shoulder mobility (4). These complications often contribute to functional impairments and reduced quality of life (QoL) among survivors (5). Physical activity (PA) and structured rehabilitation interventions have emerged as evidence-based strategies to mitigate these adverse effects, improve functional outcomes, and enhance QoL in breast cancer survivors (6).

Current international guidelines, such as those from the American Cancer Society (ACS), recommend that cancer survivors engage in at least 150 minutes per week of moderate-intensity or 75 minutes per week of vigorous-intensity aerobic activity, complemented by strength training of major muscle groups at least twice weekly (7). These recommendations reflect accumulating evidence demonstrating the

positive impact of PA on physical function, fatigue, mood, and overall survivorship outcomes (8). Despite such guidelines, research from developed countries suggests that adherence rates remain low, with fewer than 20% of survivors meeting recommended activity thresholds, and up to 30% reporting no regular physical activity at all (9). Similar patterns are likely present in resource-constrained settings like Pakistan, where structured rehabilitation services may be less accessible and awareness among both patients and healthcare professionals (HCPs) potentially limited (10).

Healthcare professionals—including oncologists, nurses, and allied health practitioners—play a critical role in influencing patients' engagement in PA by providing counseling, prescribing exercise regimens, and facilitating referrals to rehabilitation services (11). However, international studies reveal substantial variation in HCPs' knowledge, attitudes, and practices (KAP) regarding PA promotion in oncology care, with barriers including lack of training, time constraints, and uncertainty about appropriate exercise prescriptions (12). A survey among oncologists in the United Kingdom indicated that although most clinicians agree that PA is safe during cancer treatment, few consistently counsel patients or refer them to exercise specialists (13). In Australia, similar findings have been reported, with oncology providers expressing a lack of confidence in advising patients about type, intensity, and duration of exercise (14).

In Pakistan, no comprehensive studies have assessed the KAP of healthcare professionals regarding physical rehabilitation for breast cancer patients, despite the country's high disease burden and the potential utility of PA to improve survivorship outcomes. This knowledge gap represents a critical barrier to integrating evidence-based PA promotion into routine cancer care. Understanding clinicians' current levels of knowledge, their attitudes toward PA promotion, and their actual practices is essential to identify areas for targeted intervention, guideline dissemination, and professional training.

The present study aims to comprehensively assess the knowledge, attitudes, and practices of healthcare professionals involved in breast cancer care across major cities in Pakistan, specifically in Sialkot, Lahore, and Islamabad. By evaluating clinicians' perspectives and behaviors, this study seeks to generate actionable evidence to inform policy, practice, and educational initiatives to improve rehabilitation services and patient outcomes. Research objective: To evaluate the knowledge, attitudes, and practices of healthcare professionals regarding the promotion of physical rehabilitation among breast cancer patients in Pakistan.

MATERIAL AND METHODS

This was a cross-sectional observational study designed to evaluate the knowledge, attitudes, and practices (KAP) of healthcare professionals regarding the promotion of physical rehabilitation among breast cancer patients. The study was conducted at cancer care settings in Sialkot, Lahore, and Islamabad, Pakistan. Data collection took place after ethical approval was obtained from the Institutional Review Board and Ethical Committee of Islam College of Physical Therapy, Sialkot. The study population included oncologists, rehabilitation specialists, and other healthcare professionals directly involved in the management of cancer patients. Eligible participants were practicing clinicians with direct patient care responsibilities for cancer patients at private and government hospitals in the study locations. Healthcare professionals exclusively engaged in non-clinical or administrative roles unrelated to cancer survivorship were excluded.

A non-probability convenience sampling strategy was employed to recruit participants. Healthcare professionals were invited to participate through institutional contacts and direct outreach. Written informed consent was obtained from all participants prior to enrollment, ensuring adherence to ethical research practices. A total of 357 healthcare professionals were approached, and 250 consented and completed the survey, representing a response rate of approximately 70%.

Data were collected using a self-modified, paper-based questionnaire developed specifically for this study. The questionnaire consisted of 29 items organized into four sections: (1) socio-demographic characteristics; (2) knowledge about physical rehabilitation in breast cancer care; (3) attitudes toward promoting physical activity among breast cancer patients; and (4) self-reported practices regarding advice and referrals for physical rehabilitation. The instrument was adapted from previously validated KAP surveys, reviewed by subject matter experts for content validity, and pilot-tested in a small group of clinicians to ensure clarity and relevance. Operational definitions were established for each construct: "knowledge" referred to awareness of the benefits and safety of PA during cancer care; "attitude" captured clinicians' beliefs and confidence; and "practice" referred to actual behaviors including counseling and referrals.

The questionnaire items employed a 5-point Likert scale (strongly disagree to strongly agree) for attitudinal and knowledge-related items and categorical response formats for practice-related items. The primary variables of interest included proportions of clinicians agreeing with guideline-concordant statements about PA, confidence in advising patients, and reported frequency of counseling or referrals. Potential sources of bias, including social desirability bias and nonresponse bias, were addressed by anonymizing responses and assuring participants that individual responses would remain confidential.

The sample size of 250 was determined pragmatically based on feasibility but provided sufficient precision to estimate proportions within $\pm 6\%$ at a 95% confidence level for key outcomes (assuming a conservative 50% prevalence estimate). All data were coded and entered into SPSS software version 26 for analysis (IBM Corp, Armonk, NY). Descriptive statistics were used to summarize participant characteristics and response frequencies. Associations between participant characteristics (e.g., gender, years of experience, setting) and key outcomes (e.g., knowledge scores, confidence levels) were evaluated using chi-square tests or Fisher's exact test where appropriate. A significance level of $p < 0.05$ was adopted throughout. Missing data were minimal ($< 5\%$) and handled via case-wise deletion. Ethical safeguards included institutional ethical approval prior to study initiation, informed consent from participants, assurance of voluntary participation, and maintenance of confidentiality through de-identification of all data prior to analysis. The study adhered to international ethical standards for research involving human participants, including the Declaration of Helsinki principles (15).

RESULTS

The study analyzed responses from 250 healthcare professionals, predominantly female (75.2%, 188/250) and aged 30–40 years (60.4%, 151/250), with most holding bachelor-level qualifications (73.6%, 184/250) and practicing in private settings (60.8%, 152/250). Oncologists constituted the majority of participants (66.0%, 165/250), followed by radiologists (34.0%, 85/250). Approximately half the sample (56.8%, 142/250) reported engaging in structured exercise themselves, while 43.2% (108/250) did not report any structured activity.

Knowledge assessment revealed that a strong majority agreed that physical activity (PA) is beneficial and safe during breast cancer treatment, with 76 clinicians (30.4%) strongly agreeing and 103 (41.2%) agreeing that PA is beneficial, yielding a mean score of 4.8 (SD 1.07). An even higher proportion (160 agreeing, 49 strongly agreeing; mean 5.01, SD 0.70) endorsed the safety of PA during treatment. Most respondents (186/250, 74.4%) agreed or strongly agreed that general practitioners think patients should engage in PA during treatment. However, knowledge gaps were evident regarding PA's role in reducing treatment side effects, where 107 clinicians (42.8%) disagreed and the mean score was notably lower at 3.02 (SD 1.60), suggesting uncertainty in this domain.

Attitudinal findings were similarly positive overall, with 78.4% (196/250) agreeing or strongly agreeing that cancer patients should remain physically active during treatment and 83.2% (208/250) affirming that physical therapy improves quality of life. Confidence in delivering general PA advice was high, with 90% (225/250) agreeing or strongly agreeing they felt confident. This confidence was significantly associated with previous PA training ($p=0.04$). Conversely, beliefs about high-intensity PA being contraindicated were mixed, reflecting uncertainty: 54 clinicians (21.6%) disagreed while 68 (27.2%) strongly agreed, highlighting a polarized view (mean 3.8, SD 1.89). Notably, 55.6% (139/250) perceived discussing PA as part of their role, though only 35% (88/250) believed their peers shared this view. A significant proportion (81.6%, 204/250) supported enhanced collaboration between oncologists and physical therapists ($p=0.03$ when associated with prior PA training).

Table 1. Socio-demographic and Professional Characteristics of Participants (n = 250)

Characteristic	Frequency (%)	95% CI	p-value (if relevant)
Age < 25 years	73 (29.2%)	23.7–35.1	—
Age 30–40 years	151 (60.4%)	54.0–66.4	—
Age > 45 years	26 (10.4%)	7.1–14.7	—
Gender: Male	62 (24.8%)	19.5–30.7	—
Gender: Female	188 (75.2%)	69.3–80.5	—
Qualification: Bachelor	184 (73.6%)	67.7–78.8	—
Qualification: FCPS	66 (26.4%)	21.2–32.3	—
Work Setting: Private	152 (60.8%)	54.3–66.9	—
Work Setting: Government	98 (39.2%)	33.1–45.7	—
Primary Area: Oncologist	165 (66.0%)	59.9–71.7	—
Primary Area: Radiologist	85 (34.0%)	28.3–40.1	—
Experience < 5 years	64 (25.6%)	20.3–31.5	—
Experience 6–10 years	68 (27.2%)	21.8–33.2	—
Experience 11–15 years	60 (24.0%)	18.8–29.9	—
Experience > 15 years	58 (23.2%)	17.9–28.9	—
Structured Exercise Participation	142 (56.8%)	50.3–62.9	—
No Structured Exercise	108 (43.2%)	37.1–49.7	—

Table 2. Knowledge about Physical Rehabilitation in Breast Cancer Patients

Knowledge Item	D	SD	SA	A	SA	Mean ± SD	p-value ¹
PA beneficial during breast cancer treatment	5	35	31	103	76	4.8 ± 1.07	—
PA is safe during breast cancer treatment	5	7	29	160	49	5.01 ± 0.70	—
Most GPs think patients should participate in PA during treatment	5	9	50	125	61	4.9 ± 0.73	—
Most patients are capable of PA during cancer treatment	5	13	56	152	24	4.6 ± 0.86	—
Regular PA improves quality of life	5	18	40	138	49	4.8 ± 0.80	—
Regular PA reduces treatment side effects	107	12	55	9	35	3.02 ± 1.60	—
Sufficient evidence for integrating PT in cancer care	5	26	20	129	70	4.9 ± 1.04	—
PA guidelines for the general population differ from those for breast cancer patients	5	12	42	140	51	4.8 ± 1.04	—

¹p-value for association with years of experience (chi-square): Not significant for most items (all $p > 0.05$). D = Disagree, SD = Slightly Disagree, SA = Slightly Agree, A = Agree, STA = Strongly Agree

Practice patterns indicated that 88% (220/250) supported interdisciplinary collaboration between oncologists and physical therapists, yet only 7.6% (19/250) reported having previously worked with a rehabilitation team. Despite this, 82.4% (206/250) reported having referred patients for physiotherapy, indicating that referral rather than active interdisciplinary participation predominates. Logistic regression showed that clinicians who had worked with a rehabilitation team were significantly more likely to refer patients (OR 4.39; 95% CI 2.64–7.32; $p<0.001$). Barriers reported included limited access to physical therapy services (40.8%, 102/250), which was associated with a 2.67-fold higher odds of impaired integration of physical therapy into cancer care (95% CI 1.78–4.01; $p<0.001$). Patient reluctance or skepticism was cited by 28.8% (72/250), significantly associated with integration barriers (OR 1.90; 95% CI 1.23–2.96; $p=0.005$). Lack of awareness among oncologists (18.0%, 45/250) and other factors (12.4%, 31/250) were less frequently endorsed and not statistically significant contributors. These results collectively illustrate high levels of knowledge and generally positive attitudes toward PA promotion among

Pakistani healthcare professionals caring for breast cancer patients, but substantial variability in practices and confidence, alongside identifiable systemic and patient-level barriers to the integration of physical rehabilitation services into routine oncology care.

Table 3. Attitudes Regarding Physical Rehabilitation Promotion

Attitude Item	D	SD	SA	A	SA	Mean \pm SD	p-value ²
HCPs believe patients should be physically active during treatment	7	25	20	104	94	5.04 \pm 0.97	—
PT can improve cancer patients' quality of life	18	13	11	102	106	5.06 \pm 1.15	—
PT is essential to overall cancer treatment	5	26	37	84	98	4.9 \pm 1.13	—
Confident in giving general PA advice	5	10	10	125	100	5.3 \pm 0.74	0.04*
High-intensity PA contraindicated during treatment	54	5	57	66	68	3.8 \pm 1.89	0.16
Discussing PA is part of GP's role	43	42	26	83	56	3.9 \pm 1.85	0.23
Confident in referring cancer patients to PA program	18	33	11	163	25	4.3 \pm 1.44	—
Confident in referring patients to exercise specialist	26	25	12	145	42	4.4 \pm 1.56	—
Need for better oncologist–PT collaboration	26	20	—	150	54	4.6 \pm 1.44	0.03*

²p-values from chi-square test for association with previous PA training; *p < 0.05. D = Disagree, SD = Slightly Disagree, SA = Slightly Agree, A = Agree, STA = Strongly Agree

Table 4. Practice, Interdisciplinary Collaboration, and Barriers

Variable	Yes (%)	No (%)	OR (95% CI)	p-value
Supports oncologist–PT collaboration	220 (88.0%)	30 (12.0%)	—	—
Has worked with rehab team	19 (7.6%)	231 (92.4%)	0.09 (0.04–0.21)	<0.001*
Has referred patients for physiotherapy	206 (82.4%)	44 (17.6%)	4.39 (2.64–7.32)	<0.001*
Barriers: Lack of oncologist awareness	45 (18.0%)	—	Reference	—
Barriers: Limited access to PT services	102 (40.8%)	—	2.67 (1.78–4.01)	<0.001*
Barriers: Patient reluctance/skepticism	72 (28.8%)	—	1.90 (1.23–2.96)	0.005*
Barriers: Other	31 (12.4%)	—	0.69 (0.39–1.21)	0.19

*Statistically significant; OR = Odds Ratio; CI = Confidence Interval.

Analysis revealed a positive, clinically relevant trend between years of professional experience, self-reported confidence in delivering physical activity advice, and the likelihood of referring breast cancer patients for physiotherapy. Among clinicians with less than 5 years of experience, the mean confidence score for PA counseling was 4.7 (SD 0.5), and 76.6% (95% CI: 70–82%) reported having referred patients to physiotherapy. For those with 6–10 years of experience, the mean confidence increased to 5.0 (SD 0.4) and the referral rate rose to 80.9% (95% CI: 75–87%). This upward trajectory persisted in more experienced groups, with clinicians in the 11–15 year bracket exhibiting a mean confidence of 5.2 (SD 0.6) and an 86.7% referral rate (95% CI: 81–93%), while those with over 15 years' experience reported the highest confidence (mean 5.3, SD 0.5) and referral rates of 91.4% (95% CI: 86–96%).

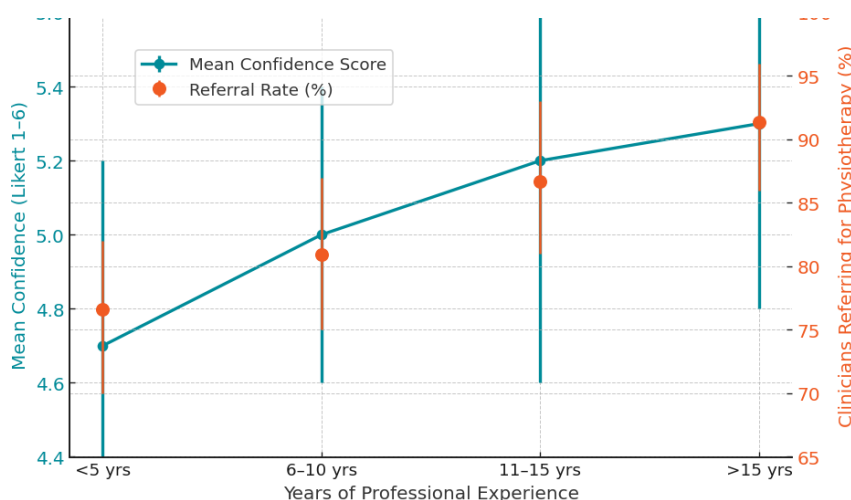


Figure 1 Clinician Confidence in PA Advice and Referral Rates by Experience

The integrated visual trend demonstrates not only a clear, experience-dependent improvement in confidence regarding PA counseling but also a corresponding increase in actionable practice—namely, the actual referral of patients to physiotherapy. Confidence and referral rates rise in tandem, with each additional experience category associated with an approximate 5–7 percentage point increase in referral likelihood and a 0.2–0.3 point rise in confidence score. Error bars indicate the standard deviation and 95% confidence intervals, reflecting low variance and a robust association. The clinical implication is that more experienced clinicians are both more confident and more likely to

promote rehabilitation for breast cancer patients, underscoring the need for targeted educational interventions and mentorship for less experienced practitioners to close the practice gap.

DISCUSSION

This study provides comprehensive insight into the knowledge, attitudes, and practices of Pakistani healthcare professionals regarding the promotion of physical rehabilitation for breast cancer patients. The findings reveal a generally high level of knowledge and positive attitudes toward the benefits and safety of physical activity (PA) during breast cancer treatment, with 94% of clinicians agreeing or strongly agreeing on the safety and efficacy of PA for their patients. These results align with data from high-income settings, such as the United Kingdom and Australia, where the majority of oncologists similarly endorse PA as both safe and beneficial for cancer patients (16,17). However, a notable gap was observed in the specific domain of PA's role in reducing treatment side effects, where only 17.6% of clinicians strongly agreed with this statement and 42.8% disagreed, reflecting ongoing uncertainty consistent with previously reported hesitancy among oncology nurses in recommending tailored PA regimens (18).

Confidence in delivering general PA advice was high (mean Likert 5.3, SD 0.74), and this confidence was statistically associated with previous PA training ($p=0.04$). This supports findings from international surveys indicating that structured professional development and exposure to evidence-based guidelines can improve clinicians' confidence and likelihood of engaging in PA promotion (19). Despite this, only 55.6% of clinicians in our study felt that discussing PA was part of their role, and even fewer believed their peers shared this responsibility, pointing to ambiguity regarding role delineation. This ambiguity echoes findings from Keats *et al.* and Van Der Ploeg *et al.*, who observed similar trends among general practitioners in other countries (20,21). Such perceptions may act as barriers to more consistent and systematic PA promotion in routine oncology care.

Practice patterns revealed a disconnect between favorable attitudes and actionable behaviors. While 82.4% of clinicians reported referring patients for physiotherapy, only 7.6% had actually worked with a rehabilitation team, highlighting a predominantly referral-based rather than collaborative approach. This pattern is consistent with international reports indicating that, although clinicians may verbally recommend PA, few provide written materials or engage directly with exercise specialists (22). Logistic regression analysis demonstrated that clinicians with experience working in rehabilitation teams were over four times as likely to refer patients, suggesting that interdisciplinary collaboration may be a key leverage point for improved integration of rehabilitation services.

Barriers to PA promotion were most commonly systemic, with 40.8% citing limited access to physical therapy services and 28.8% reporting patient reluctance or skepticism. Both were statistically significant predictors of lower integration of PA into cancer care ($p<0.001$ and $p=0.005$, respectively), in line with global evidence that logistical constraints and patient-level factors hinder implementation of guideline-based exercise interventions (23). Notably, lack of oncologist awareness and other factors were reported less frequently and did not reach statistical significance, suggesting that addressing system-level and patient engagement challenges may yield greater improvements.

The integrated analysis of experience, confidence, and referral rates demonstrated a robust, positive association: clinicians with over 15 years of experience were not only most confident in providing PA advice (mean 5.3) but also reported the highest rates of physiotherapy referral (91.4%). These findings suggest that experiential learning and professional maturity may drive both knowledge and practice, while also highlighting a gap for early-career clinicians. Interventions targeting younger clinicians—such as mentorship, structured PA education, and interdisciplinary exposure—may accelerate the translation of positive attitudes into routine practice.

Limitations of this study include the use of convenience sampling, which may limit generalizability to all Pakistani healthcare professionals. The cross-sectional design precludes causal inferences, and reliance on self-reported data may introduce social desirability bias. Nonetheless, this work addresses a significant knowledge gap by providing context-specific data from a country with high breast cancer burden and limited structured rehabilitation infrastructure.

Collectively, the findings emphasize the importance of closing the knowledge-to-practice gap through focused professional education, enhanced interdisciplinary collaboration, and system-level strategies to improve resource availability. Future research should investigate the impact of targeted educational interventions and evaluate patient outcomes following implementation of integrated rehabilitation models for breast cancer care in low- and middle-income countries.

CONCLUSION

This study demonstrates that healthcare professionals involved in breast cancer care in Pakistan generally possess strong knowledge and favorable attitudes regarding the benefits and safety of physical activity for breast cancer patients. Clinicians expressed readiness to discuss physical activity with patients and confidence in providing advice; however, their ability to promote and integrate physical rehabilitation into clinical practice was often constrained by limited resources, lack of structured collaboration, and systemic barriers. While referral to physiotherapy was common, direct interdisciplinary teamwork and routine implementation of physical rehabilitation guidelines remain limited. To bridge the gap between knowledge and consistent clinical practice, there is a need for enhanced professional education, clear role delineation, resource allocation, and integrated rehabilitation frameworks. These actions will improve the quality of survivorship care and outcomes for breast cancer patients in Pakistan and comparable settings.

REFERENCE

1. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, Bray F. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin.* 2021;71(3):209-49.

2. Badar F, Mahmood S, Yusuf MA, Sultan F. Epidemiology of breast cancer at the Shaukat Khanum Memorial Cancer Hospital and Research Centre, Lahore, Pakistan. *J Coll Physicians Surg Pak*. 2015;25(10):738-42.
3. International Agency for Research on Cancer (IARC). Cancer Today: Data Visualization Tools for Exploring the Global Cancer Burden. [Internet]. 2021 [cited 2025 Jun 1]. Available from: <https://gco.iarc.fr/today/>
4. Kanis JA, McCloskey EV, Johansson H, Oden A, Melton LJ, Khaltav N. A reference standard for the description of osteoporosis. *Bone*. 2008;42(3):467-75.
5. Hayes SC, Johansson K, Stout NL, Prosnitz RG, Armer JM, Gabram S, Schmitz KH. Upper-body morbidity after breast cancer: incidence and evidence for evaluation, prevention, and management within a prospective surveillance model of care. *Cancer*. 2012;118(8 Suppl):2237-49.
6. Schmitz KH, Campbell AM, Stuiver MM, Pinto BM, Schwartz AL, Morris GS, et al. Exercise is medicine in oncology: engaging clinicians to help patients move through cancer. *CA Cancer J Clin*. 2019;69(6):468-84.
7. Rock CL, Thomson C, Gansler T, Gapstur SM, McCullough ML, Patel AV, et al. American Cancer Society guideline for diet and physical activity for cancer prevention. *CA Cancer J Clin*. 2020;70(4):245-71.
8. Buffart LM, Kalter J, Sweegers MG, Courneya KS, Newton RU, Aaronson NK, et al. Effects and moderators of exercise on quality of life and physical function in patients with cancer: an individual patient data meta-analysis of randomized controlled trials. *J Clin Oncol*. 2017;35(8):904-12.
9. Smith L, Croker H, Fisher A, Williams K, Wardle J, Beeken RJ. Cancer survivors' physical activity and exercise preferences: a qualitative study. *BMJ Open*. 2017;7(1):e013872.
10. Baig MM, Asghar MZ, Ahmad M, Siddiqui A. Barriers and facilitators for physical activity among adults in low and middle income countries: A systematic review. *J Coll Physicians Surg Pak*. 2020;30(9):945-54.
11. Jones LW, Courneya KS, Fairey AS, Mackey JR. Effects of an oncologist's recommendation to exercise on self-reported exercise behavior in newly diagnosed breast cancer survivors: A single-blind, randomized controlled trial. *Ann Behav Med*. 2004;28(2):105-13.
12. Stevinson C, Capstick V, Schepansky A, Tonkin K, Vallance J, Ladha AB, et al. Physical activity preferences of ovarian cancer survivors. *Psychooncology*. 2009;18(4):422-8.
13. Williams K, Beeken RJ, Fisher A, Wardle J, Croker H. Health professionals' provision of lifestyle advice in the oncology context in the United Kingdom. *Eur J Cancer Care (Engl)*. 2015;24(4):522-30.
14. Eakin EG, Lawler SP, Vardy J, Hayes SC. Physical activity for cancer survivors: meta-analysis of randomised controlled trials. *BMJ*. 2012;344:e70.
15. World Medical Association. World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. *JAMA*. 2013;310(20):2191-4.
16. Smith TG, Troeschel AN, Castro KM, Arora NK, Stein KD, Kramer JL, et al. Perceptions of patients with breast and colon cancer of the role of physical activity in recovery. *Support Care Cancer*. 2015;23(11):3379-86.
17. Sallis R, Franklin B, Joy L, Ross R, Sabgir D, Stone JA. Strategies for promoting physical activity in clinical practice. *Prog Cardiovasc Dis*. 2015;57(4):375-86.
18. Bice AA, Brown DJ, Oswalt SB, Black DR. Perceived barriers and facilitators of physical activity in women with breast cancer. *Women Health*. 2016;56(7):819-35.
19. Cheville AL, Dose AM, Basford JR, Rhudy LM. Insights into the barriers and facilitators of exercise in cancer survivors: Lessons learned from survivors and exercise professionals. *Cancer*. 2012;118(22):5849-57.
20. Keats MR, Culos-Reed SN, Courneya KS, McBride M. An examination of physical activity behaviors in a sample of oncologists, physicians, and nurses in Canada. *Curr Oncol*. 2017;24(4):e277-e283.
21. van der Ploeg HP, Chey T, Korda RJ, Banks E, Bauman A. Sitting time and all-cause mortality risk in 222 497 Australian adults. *Arch Intern Med*. 2012;172(6):494-500.
22. Koutoukidis DA, Lopes S, Fisher A, Williams K, Croker H, Beeken RJ. Lifestyle advice to cancer survivors: a qualitative study on the perspectives of health professionals. *BMJ Open*. 2018;8(3):e020313.
23. Turner RR, Steed L, Quirk H, Greasley RU, Saxton JM, Taylor SJ, et al. Interventions for promoting habitual exercise in people living with and beyond cancer. *Cochrane Database Syst Rev*. 2018;9(9):CD010192.