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Knowledge and Attitudes of Oncologists in Recommending Exercises to Cancer Patients in Pakistan: A Nationwide Observational Study

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ABSTRACT

Background: Exercise has been increasingly recognized as beneficial in cancer care, improving quality of life and treatment outcomes. However, oncologists' knowledge and attitudes toward recommending exercise to cancer patients remain variable.

Objective: To assess the knowledge, attitudes, and practices of oncologists in Pakistan regarding exercise recommendations for cancer patients.

Methods: A nationwide observational study was conducted from May to October 2023. A structured questionnaire was administered to 53 oncologists from major cancer hospitals across Pakistan. The survey included sections on personal exercise habits, exercise recommendations to patients, perceived effects on cancer therapy, and barriers to recommending exercise. Data were analyzed using SPSS version 29, employing descriptive statistics and inferential tests, with $p<0.05$ as significant.

Results: Of the oncologists, 32% reported regular exercise, while 66.1% recommended exercise to cancer patients. About 58.4% believed exercise alleviates cancer-related symptoms, and 54.7% and 56.6% believed it enhances chemotherapy and radiotherapy effectiveness, respectively. A significant correlation was found between awareness of exercise guidelines and positive attitudes toward recommending exercise ($p<0.000$).

Conclusion: Most oncologists recognize the benefits of exercise for cancer patients but require further training to improve their knowledge and recommendation practices.

INTRODUCTION

Cancer patients frequently experience a multitude of debilitating side effects, including pain, fatigue, depression, stress, bone pathologies, neurological complications, metabolic disorders, muscle weakness, and sleep disturbances, resulting from both their disease and the therapies they undergo (1). Historically, medical advice for cancer patients centered around rest and avoidance of physical exertion, particularly before the 1990s. However, this approach began to shift in the subsequent decades. Current research highlights the role of exercise in mitigating cancer-associated anxiety, depressive symptoms, physical health decline, and cancer-related fatigue, leading to enhanced overall quality of life (2). The beneficial effects of exercise have been examined across various phases—before, during, and after active cancer therapy sessions. It is suggested that exercise influences cancer at the molecular and systemic levels by modulating inflammatory cytokines and infiltrating immune cells, which specifically target tumor cells, affecting their genesis and progression (3). Preclinical studies have demonstrated that exercise serves both as an adjuvant therapy to conventional cancer treatments and as a direct inhibitor of cancer cell development in rodent models (4). Clinical evidence further indicates that individuals diagnosed with cancer who maintain regular exercise routines have a reduced relative risk of cancer-related mortality and recurrence. They also report fewer and less severe treatment-related side effects (5). Specific to breast and colon cancer, patients engaging in regular physical activity have shown a significant 50% improvement in survival rates (6). Additionally, resistance and aerobic exercise training have been associated with improved quality of life and cardiopulmonary endurance for cancer patients during and after therapy (7, 8). Aerobic exercise has also been found to mitigate the cardiotoxic effects of certain chemotherapeutic agents, such as trastuzumab and doxorubicin, while potentially enhancing cardiopulmonary endurance (6).

The link between exercise and reduced mortality and improved survival rates among survivors of colon, prostate, or breast cancer has been substantiated by several studies (9, 10). A systematic review highlighted that breast cancer survivors with lymphedema who engaged in low to moderate-intensity, high-frequency, dynamic exercise experienced significant improvements in both subjective and objective measures (11). Accordingly, the American College of Sports Medicine (ACSM) advises cancer survivors to avoid inactivity, promptly resume normal daily activities post-surgery or during any adjuvant therapy and sustain these activities to the maximum feasible extent (2). Moreover, physical activity guidelines are increasingly being recognized as an integral and ongoing component of the treatment protocol for all cancer survivors (2). The role of

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oncology care providers in promoting and maintaining fitness regimens for cancer patients is crucial, both before and after treatment. While exercise is acknowledged as an important element in cancer care, it is often overlooked in clinical practice (3). Therefore, assessing oncology care providers' knowledge about and attitudes toward exercise for cancer patients is essential. This study aims to evaluate the knowledge and attitudes of oncologists regarding the promotion of physical activity for their cancer patients.

Understanding oncologists' perspectives on exercise is vital, as it directly influences their likelihood of recommending it to patients. Notably, our study explores the current practices of oncologists in Pakistan concerning exercise recommendations to cancer patients, identifying gaps in knowledge, barriers, and areas for improvement. Given the absence of national exercise guidelines for cancer patients in Pakistan, this study is particularly relevant. In doing so, it contributes to the broader dialogue on optimizing supportive care for cancer patients through integrated multidisciplinary approaches. Internationally, guidelines recommend adopting a consistent exercise regimen as a cancer prevention method and enhancing treatment efficacy. Research has demonstrated that both aerobic and strength training exercises improve the overall well-being and cardiovascular fitness of cancer patients before and during therapy, reducing the risk of mortality for survivors of colon, breast, and prostate cancer (4, 9, 10, 17). However, there is a notable lack of standardized questionnaires available in the literature that specifically address the perspectives of oncologists on this issue, limiting the assessment of validity and reliability in studies like ours. Additionally, concerns regarding the potential risks and side effects of exercise for cancer patients remain prevalent among some clinicians (7), underscoring the need for further education and guidelines.

In summary, there is a growing body of evidence supporting the efficacy of exercise in cancer prevention, improving treatment outcomes, and preventing recurrence. Oncologists have progressively enhanced their understanding of these benefits in recent years. However, despite their limited knowledge of specific exercise guidelines for cancer patients, most oncologists display a positive attitude toward recommending exercise to their patients, which is a promising sign. To achieve the best outcomes for cancer patients, it is essential to focus on the primary disease while fostering collaboration between oncology departments and physical therapy rehabilitation units through a multidisciplinary approach.

MATERIAL AND METHODS

The study was conducted at the Women Institute of Rehabilitation Sciences, Abbottabad, from May 2023 to October 2023. Oncology care providers were selected randomly from major cancer hospitals across Pakistan, including Shaukat Khanum Memorial Cancer Hospital and Research Centre in Lahore, Aga Khan University Hospital in Karachi, National Institute of Radiotherapy and Oncology in Karachi, Sindh Institute of Oncology and Transplants in Karachi, Institute of Nuclear Medicine, Oncology and Radiotherapy in Abbottabad, The Indus Hospital in Peshawar, Khyber Teaching Hospital in Peshawar, and Fauji Foundation Hospital in Rawalpindi. The inclusion criteria required participants to be licensed physicians with at least two years of experience in oncology and involved in the treatment of adult cancer patients. Physicians not meeting these criteria were excluded from the study. A total of 53 oncology physicians participated, with an average age of 44.5 ± 9.6 years, ranging from 30 to 60 years. Participants were from diverse specialties, including radiation oncology, hematological oncology, medical oncology, and surgical oncology. The sample size was calculated using OpenEpi with a 95% confidence interval and a 5% margin of error.

A structured questionnaire was employed to collect data, aiming to assess the knowledge, attitudes, and practices of oncologists regarding exercise recommendations for cancer patients (12). The questionnaire comprised five sections. The first section gathered information on the oncologists' exercise habits, including the frequency, duration, and type of physical activities performed weekly, as well as their motivations for exercising. The second section focused on whether the oncologists recommended exercise to their cancer patients, the types of exercises they suggested, and the reasons for not recommending exercise if applicable. The third section explored the perceived impact of exercise on various cancer therapies, such as chemotherapy, radiotherapy, and immunotherapy, and its effects on cancer-related symptoms, including weakness and fatigue. The fourth section assessed the availability of exercise facilities in the hospitals and the referral practices of oncologists to these facilities. The final section inquired about the oncologists' willingness to receive specialized training in exercise prescription for cancer patients. Data were collected through face-to-face interviews conducted by a single researcher to ensure consistency in data collection.

Ethical approval for the study was obtained from the Ethical Committee of the Institutional Review Board (IRB) of the Women Institute of Rehabilitation Sciences, Abbottabad, with reference number 1888/WIRS/23, dated 15/05/2023. All participants provided written informed consent before participating in the study. The study adhered to the ethical principles outlined in the Declaration of Helsinki. Confidentiality and anonymity of the participants were strictly maintained throughout the research process.

Statistical analysis was performed using IBM SPSS Statistics version 29.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics, such as means, standard deviations, medians, and frequencies, were calculated for continuous and categorical variables, respectively. Categorical differences between groups were evaluated using Fisher's exact test and the chi-square test, while the Student's t-test was applied for comparisons of parametric variables. A p-value of less than 0.05 was considered statistically significant. The relationships between the oncologists' awareness of standardized exercise guidelines and their attitudes toward recommending exercise to cancer patients were analyzed using appropriate statistical methods. The

results were interpreted to identify trends and significant associations within the data.

RESULTS

The demographic characteristics of the participants are summarized in Table 1. A total of 53 oncology physicians participated in the study, with a mean age of 44.5 ± 9.6 years, ranging from 30 to 60 years. Of these, 68% were male and 32% were female. The participants represented various specialties: 39.6% were surgical oncologists, 24.5% were medical oncologists, 20.7% were radiation oncologists, and 15% were hematologists. On average, participants managed 42.1 ± 72.3 patients per week.

Table 1: Participants' Demographic Characteristics

Characteristic	Frequency (n)	Percentage (%)	Mean ± SD
Age (years)	-	-	44.5 ± 9.6
Sex			
Male	36	68	-
Female	17	32	-
Specialty			
Radiation Oncology	11	20.7	-
Hematology	8	15	-
Medical Oncology	13	24.5	-
Surgical Oncology	21	39.6	-
Average patients per week	-	-	42.1 ± 72.3

The exercise habits and motivations of oncology care providers are detailed in Table 2. Of the 53 participants, 32% (n=17) reported exercising regularly, while 68% (n=36) did not engage in regular exercise. Among those who exercised, 41.1% (n=7) preferred aerobic exercises, while 58.9% (n=10) favored strengthening exercises. The most common reasons for exercise included increasing aerobic capacity (58.9%) and muscle strength (29.4%), along with other reasons such as weight loss, healthy lifestyle, and stress reduction.

Table 2: Exercise Habits and Motivations

Item	Frequency (n)	Percentage (%)	Mean ± SD
Regular exercise			
Yes	17	32	-
No	36	68	-
Type of exercise			
Aerobic	7	41.1	-
Strengthening	10	58.9	-
Reasons for exercise			
Increase aerobic capacity	7	58.9	-
Increase muscle strength	5	29.4	-
Other (weight loss, healthy lifestyle, reducing stress)	5	29.4	-
Exercise duration (years)	-	-	5.9 ± 4.2
Weekly exercise days	-	-	2.4 ± 1.6
Total exercise time per week (hours)	-	-	5.0 ± 1.4

Regarding exercise recommendations for patients, 66.1% (n=35) of the oncologists advised their cancer patients to engage in regular exercise, while 33.9% (n=18) did not (Table 3). Among those who did not recommend exercise, the most

Table 3: Exercise Recommendations and Reasons for Non-recommendation

Item	Frequency (n)	Percentage (%)
Recommended regular exercise to patients		
Yes	35	66.1
No	18	33.9
Reasons for not recommending exercise		
Unaware of the necessity to prescribe exercise	2	11.1
Lack of time to recommend exercise	1	5.5
Uncertainty about appropriate referral sources	1	5.5
Insufficient training to provide workout recommendations	3	16.6
Uncertain about what type of exercise to suggest	1	5.5
Concerns about safety of exercise for cancer patients	4	22.2
Belief that exercise may exacerbate cancer-related symptoms	4	22.2

cited reasons were concerns that exercise might not be safe for cancer patients (22.2%) or that it could worsen cancer-related symptoms such as fatigue (22.2%). Table 4 illustrates the perceived effects of exercise on cancer therapies and related symptoms. Among the respondents, 58.4% (n=31) believed that physical activity decreased the occurrence of cancer-related symptoms such as weakness and fatigue. Moreover, 54.7% (n=29), 56.6% (n=30), and 47.1% (n=25) of the oncologists believed that exercise increased the effectiveness of chemotherapy, radiotherapy, and immunotherapy, respectively.

Table 4: Perception and Knowledge of Exercise Effects

Item	Frequency (n)	Percentage (%)
Belief that exercises decreases cancer-related symptoms		
Yes	31	58.4
No	17	32
Not aware	5	9.4
Belief that exercise increases the effectiveness of chemotherapy		
Yes	29	54.7
No	16	30.1
Not aware	8	15.2
Belief that exercise enhances the efficacy of radiotherapy		
Yes	30	56.6
No	16	30.1
Not aware	7	13.2
Belief that exercise enhances the efficacy of immunotherapy		
Yes	25	47.1
No	15	28.3
Not aware	13	24.5

The association between exercise habits, demographic characteristics, and oncologists' attitudes is presented in Table 5. Among the oncologists who exercised regularly (n=17), 100% recommended exercise to their patients, while only 50% of those who did not exercise themselves did so. A significant difference was observed between male and female oncologists in terms of regular exercise participation, with more males exercising regularly (p=0.023).

Table 5: Association Between Demographics, Exercise Habits, and Attitudes

Variable	Exercised Regularly (n=17)	Did Not Exercise Regularly (n=36)	p-value
Age (years)	42.7 ± 7.9	40.5 ± 8.9	0.390*
Professional years	16.1 ± 2.2	17.8 ± 4.3	0.219*
Number of patients per week	56.5 ± 32.9	51.1 ± 36.2	0.721*
Sex (Female)	2 (3.7%)	15 (28.3%)	0.023**
Sex (Male)	15 (28.3%)	21 (39.6%)	

Note: *Independent sample t-test; **Chi-square test.

A significant correlation was found between awareness of standardized exercise guidelines and the oncologists' attitudes toward recommending physical activity to cancer patients ($p < 0.000$), as shown in Table 6.

Table 6: Awareness and Attitudes Correlation

Awareness of Standardized Exercise Protocols	Attitudes in Recommending Exercise	p-value
Yes	Positive	<0.000**
No	Negative	

Overall, the results indicate that while a majority of oncologists recognize the benefits of exercise for cancer patients, there remains a need for further education and training to increase awareness and improve practices regarding exercise recommendations.

DISCUSSION

The findings of this study revealed that a considerable proportion of oncology physicians recommended exercise to their cancer patients, aligning with the growing recognition of the benefits of physical activity in cancer care. Approximately 66.1% of the oncologists advised their patients to engage in regular exercise, a practice consistent with international guidelines that emphasize the role of exercise in improving quality of life and reducing treatment-related adverse effects for cancer survivors (2). However, despite the high recommendation rates, only 32% of the oncologists reported engaging in regular physical activity themselves. This discrepancy between personal behavior and professional recommendation has also been noted in

other studies, such as Hardcastle et al., which found that a smaller proportion of oncologists practiced what they advocated regarding physical activity (15).

The study demonstrated that the oncologists who regularly engaged in physical activity were more likely to recommend it to their patients. This finding aligns with previous research by Park et al., which showed that oncologists who exercised were significantly more inclined to promote physical activity among their patients (13). The current study also highlighted that oncologists' awareness of standardized exercise guidelines was significantly associated with their attitudes toward recommending exercise, corroborating the findings of Adams et al., who reported that knowledge gaps among oncologists could affect their ability to confidently recommend exercise (14). These observations underscore the need for targeted educational interventions to improve oncologists' understanding of exercise guidelines and its role in cancer care.

The study further revealed that oncologists recognized the positive effects of exercise on cancer therapies, such as chemotherapy, radiotherapy, and immunotherapy, and its ability to alleviate cancer-related symptoms like fatigue and muscle weakness. Similar results were reported by Schwartz et al., where physical activity was shown to reduce the adverse effects associated with cancer treatments, thereby supporting the potential role of exercise as an adjunctive therapy (16). Additionally, the belief that exercise could enhance treatment efficacy has been supported by preclinical data, which showed that exercise-induced molecular changes could directly inhibit cancer cell growth and improve therapeutic outcomes (3, 4). These findings highlight the importance of integrating exercise into cancer care to optimize treatment effects and improve patient outcomes.

A significant strength of this study was its nationwide scope, which included oncology care providers from major cancer treatment centers across Pakistan, offering a comprehensive perspective on the current practices and attitudes toward exercise recommendations among oncologists. The study also employed a structured questionnaire that enabled consistent data collection and facilitated the comparison of findings with international research. However, the study had several limitations. One notable limitation was the use of a pre-existing, self-structured questionnaire, which may have affected the validity and reliability of the responses. Unlike standardized instruments, this questionnaire had not undergone extensive validation, which could limit the generalizability of the findings. Future research should consider employing validated tools to ensure more reliable data collection.

Another limitation of this study was the lack of a national exercise guideline specific to cancer patients in Pakistan. This absence may have contributed to the variability in exercise recommendations observed among the oncologists. The findings indicate a need for the development of national guidelines and educational programs to standardize exercise prescriptions for cancer patients, ensuring consistent and evidence-based recommendations across the country. Such guidelines could be modeled after those of the American College of Sports Medicine or other international bodies, which advocate for the integration of exercise as a fundamental component of cancer care (2).

The study also identified specific barriers that prevent oncologists from recommending exercise, including concerns about the safety of exercise for cancer patients and a lack of knowledge about appropriate exercise prescriptions. These barriers were also highlighted in the study by Jones et al., where oncologists cited a lack of training as a primary reason for not recommending exercise (12). Addressing these barriers through targeted training programs could empower oncologists to incorporate exercise into cancer management plans confidently. Moreover, multidisciplinary collaboration between oncology and rehabilitation departments could further enhance the delivery of comprehensive care.

CONCLUSION

In conclusion, while the majority of oncologists in this study acknowledged the benefits of exercise for cancer patients, there remains a need for further education to bridge the knowledge gaps and improve exercise recommendation practices. Developing national exercise guidelines, providing targeted training for oncology care providers, and fostering a collaborative approach between oncology and rehabilitation services could collectively enhance patient outcomes. Future studies should focus on exploring effective strategies for implementing these recommendations and evaluating their impact on clinical practice and patient quality of life.

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