Original Article

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# A Qualitative Exploration of Knowledge, Attitude, and Preferences for Physical Activity Among Women with a History of Breast Cancer in Western India

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## Abstract:

**Objective:** Despite the proven benefits of physical activity (PA) in cancer recovery, very few women with a history of breast cancer (WhBC) engage in regular PA programs, especially in a country like India, where sociocultural factors significantly influence women's participation in PA. Preference assessment is a valuable first step in developing and implementing strategies to improve exercise behavior and practice patterns. The present study aimed to identify the knowledge, attitude, and preferences for PA among WhBC in western India.

**Material and Methods:** Eighteen WhBC were recruited with convenience sampling. The qualitative approach was adopted using a semi-structured interview guide to understand the knowledge, attitude, and preferences for PA. One-to-one, in-depth interviews were conducted, and conversations were audio-recorded after obtaining written informed consent. Thematic analysis was conducted based on codes and themes derived from the transcripts.

**Results:** Several themes emerged, including understanding of PA, its perceived effects, perception of being physically active, optimism, and beliefs about PA, guidance from Health Care Professionals (HCPs), influences in PA engagement, and PA preferences. The majority of Indian WhBC considered housework as PA, and were in consensus on continuing it even during survivorship. Participants recognized multidimensional benefits of PA, including both physical and mental well-being, and showed a positive attitude towards it. PA preferences varied, being influenced by cultural norms, gender roles, and socioeconomic factors.

**Conclusion:** Indian WhBC preferred home-based PA, which primarily involves walking, and is comfortable, safe, and compatible with their daily routines. These findings highlight the need to consider survivors' perspectives and preferences when designing culturally appropriate PA programs.

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## Introduction

Cancer survivors are more likely to experience health decline due to their diagnosis and subsequent treatments[1]. Breast cancer is the most common malignancy, ranking first in the world, and is the fifth leading cause of death in women[2,3].

Evidence suggests that multifaceted sequelae of breast cancer do not cease with the conclusion of treatment. Many women with a history of breast cancer (WhBC) experience persistent physical symptoms of cancer and its treatment, including fatigue, pain or abnormal sensations in arms or breasts, hormone-related symptoms, sexual dysfunction, and the cardio-toxicity associated with cancer treatments like chemotherapy, targeted therapy, and radiation therapy themselves[4,5]. These symptoms may impair psychosocial adaptation, limit participation in daily tasks, and reduce health-related quality of life (HRQoL)[4].

Longitudinal studies have shown that physical activity levels among women with breast cancer tend to decline over time[5,6]. Mason et al. (2013) found that aerobic-recreational PA remained steady for up to 5 years post-diagnosis but significantly declined thereafter; only about 12.3% of initially inactive women became active enough to meet PA guidelines[6]. Similar trends have been observed in other cohorts, where survivors remained less active than age-matched healthy women[7–12]. Many studies report general guidelines of 150 minutes per week of moderate-to-vigorous PA not being met by 60–85% of WhBC, even 10 years after the diagnosis and treatment[13–16].

Regular PA plays an important role in reducing breast cancer risk and improving recovery after treatment. Evidence shows that consistent moderate-to-vigorous PA improves physical and psychological function, reduces fatigue, and enhances quality of life in WhBC[17–24]. Despite a reduction in PA levels after cancer diagnosis, unfortunately, only a small portion of cancer survivors take part in regular PA programs[24].

Barriers such as limited awareness of available exercise programs, lack of time, distance to exercise facilities, and the cost of treatment or travel often restrict PA participation during and after treatment[25,26]. Alongside these barriers, personal preferences play an important role in affecting adherence to PA among WhBC[1]. Understanding such preferences can help design feasible and acceptable programs that better align with survivors' needs and contexts to improve overall PA participation.

Although studies have identified attitude, exercise behavior, preference, barriers, and facilitators among various types of cancer survivors[1,3,6,24], data for the Indian population are lacking. Breast cancer is among the most common cancers in India, with an estimated 2,21,757 cases in 2022, making up a large portion of the national cancer burden[27].

Globally, the prevalence of insufficient physical activity remains high, with 27.5% of adults not meeting recommended PA levels in 2016. The lowest activity levels have been observed in East and Southeast Asia (17.6%)[28].

As a low- to middle-income and culturally diverse country, India presents unique challenges to women's engagement in physical activity, where social expectations and caregiving roles often take precedence over personal health behaviours. Such sociocultural expectations, combined with modesty concerns, safety issues, and limited access to exercise facilities at preferred times[25], may influence attitudes and participation in physical activity after breast cancer treatment.

These contextual factors underscore the need to understand how Indian women perceive and engage in physical activity after breast cancer treatment, and how they prefer to be physically active. This can help the healthcare providers identify service gaps and update existing rehabilitation protocols for WhBC. Thus, the present study aimed to identify the knowledge, attitude, and preferences for PA among WhBC. Understanding this is essential for developing culturally appropriate and accessible exercise recommendations for Indian WhBC.

## Material and Methods

Ethical approval was obtained from the Institutional Ethics Committee (IEC) for this single-centre study. Eighteen WhBC, aged 40 years and above, who had completed surgical and/or adjuvant treatments, were recruited for the study with convenience sampling. Women with mental illness, limiting their participation in interviews, and metastasis were excluded.

A qualitative approach using semi-structured interviews was employed to explore knowledge, attitudes, and preferences for PA among WhBC. An interview guide with open-ended questions, for example, "What is your definition of physical activity?", "What does being physically active mean to you?", and "What type of physical activity or exercise program would you prefer to participate?" – were developed based on previous research[1] (Supplementary file) to ensure consistency. Forward and backward translation of the interview guide was carried out and pilot-tested among WhBC before the commencement of the study. Participants' demographics and medical/surgical history were also collected.

Written informed consent was obtained from all participants after explaining the purpose and study procedure (through an information sheet). Face-to-face, in-depth interviews were conducted at the physiotherapy department in a hospital setting, using a semi-structured interview guide. The participants were interviewed during their regular hospital appointments. Each participant was interviewed once, and their request, if any, to have a family member present during the interview was accepted to ensure their comfort. Conversations were audio-recorded using a mobile phone, transcribed in the same language (Gujarati), and translated into English. The translation and back-translation of interview transcripts were carried out by an independent bilingual translator to ensure accuracy and meaning equivalence. Fictitious numbers were used for transcripts instead of names to maintain confidentiality.

Data were analyzed using the six-step thematic analysis approach described by Braun and Clarke[29]. The process involved (1) familiarization with the data through repeated reading of transcripts, (2) generation of initial codes, (3) searching for themes by collating similar codes, (4) reviewing themes to ensure coherence and consistency with coded extracts, (5) defining and naming themes, and (6) producing the report with supporting quotes. The Principal Investigator (PI) generated initial codes and developed potential themes, which were reviewed and refined in collaboration with the co-Investigators (CIs) to ensure credibility and confirmability. Any discrepancies were discussed until a consensus was achieved.

### Methodological rigor and reflexivity

To further strengthen methodological rigor, the study adhered to the Consolidated Criteria for Reporting Qualitative Research (COREQ) guidelines. The PI, a physiotherapist experienced in oncology rehabilitation, maintained reflexivity by acknowledging the prior assumptions about the benefits of PA and consciously considering them during analysis. The CIs, trained in qualitative health research, served as peer reviewers to validate interpretations. Credibility was enhanced through member checking, where participants were verbally summarized with the key points at the end of the interview (triangulation, through a review of the

transcripts and independent coding by all three researchers, and audit-trail documentation of coding decisions and theme development). Dependability and confirmability were addressed by keeping detailed notes and discussing discrepancies until consensus was reached. Data saturation was declared when no new themes emerged.

## Results

Characteristics of the study participants are presented in Table 1. The mean age of participants was 60 years (42-80 years). Most had their primary education (up to Grade 7) and were housewives. All the WhBC had modified radical mastectomy (MRM) and received chemotherapy and radiation therapy, maintaining sample homogeneity. The time point ranged from 1 to 12 years from the diagnosis and completion of treatment. Mean and standard deviation (S.D.) were used for quantitative variables like age; frequency (n) and percentage (%) were calculated for nominal variables.

Nine themes, from the three main research areas, emerged from the analysis (Figure 1).

**Table 1** Demographic characteristics of breast cancer survivors

| Variables | Total N=18 |
|---|---|
| Age (mean±S.D.), years | 60.11±11.20 |
| Education, n (%) | |
| No education | 2 (11.11) |
| Primary education (up to Grade 7) | 5 (27.77) |
| Secondary education (Grade 8 to 10) | 3 (16.66) |
| Higher secondary education (Grade 11 and 12) | 4 (22.22) |
| Degree course | 4 (22.22) |
| Occupation, n (%) | |
| Housewife | 12 (66.66) |
| Working (Farmer, tailor, teacher) | 3 (16.66) |
| Retired (Teacher) | 3 (16.66) |
| Socio-economic status, n (%) (Revised Prasad's Classification revision for October 2023) | |
| I | 9 (50) |
| II | 4 (22.22) |
| III | 2 (11.11) |
| IV | 1 (5.55) |
| V | 2 (11.11) |
| Marital status, n (%) | |
| Married | 13 (72.22) |
| Widow | 5 (27.77) |
| Comorbidities, n (%) (Based on medical records) | |
| Diabetes | 1 (5.55) |
| Hypertension | 3 (16.66) |
| Dyslipidaemia | 1 (5.55) |

N=total number of participants, n=frequency of participants

**Understanding PA and the perception of being physically active**

Most participants consider housework as PA along with walking, running, shoulder and leg exercise, yoga, and job-work.

*"I would call my housework and my sewing work… all that physical activity."(p5)*

*"Doing housework, right..! Doing housework, doing exercise and a…. second… sweeping and mopping…these all….Doing all the housework, walking, running all that…. everything like that comes in."(p10)*

Many participants consider themselves to be active when they can independently do different physical activities. They also stressed the importance of mental well-being to be overall active.

*"Being physically active means we can do our daily work. If we want to go anywhere outside, we can go by ourselves. Can go without anyone's help."(p4)*

*"If you can do your daily work regularly, then it means you are physically active."(p10)*

The participant also highlighted the connection between mental and physical health. They explained that being inactive often leads to feelings of sadness and stiffness, emphasizing the importance of staying physically active.

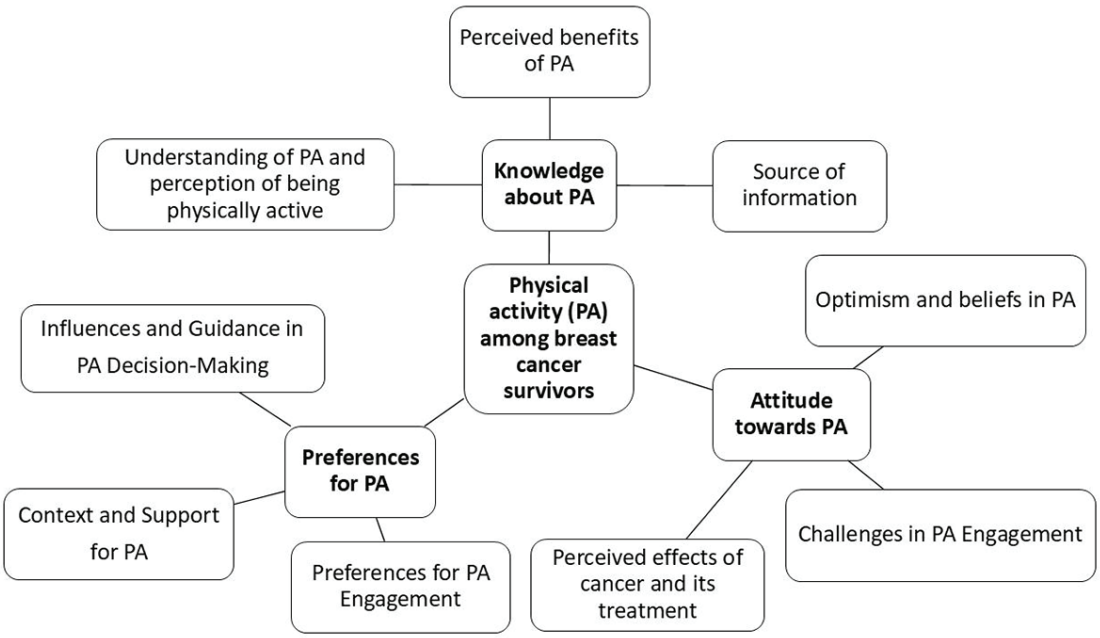


**Figure 1** Development of themes and research areas

*"If you don't stay active, you get a little mentally depressed, the body feels stiff, like the shoulder gets locked in frozen shoulder. I do all the housework… I wake up early in the morning and do some exercise in my own way….doing all this makes me feel that I am physically active."(p18)*

**Perceived benefits of PA**

WhBC have reported various physical (reduction in pain, fatigue, edema, weight; improved movements and endurance), mental (increased morale, motivation, reduced stress), and social benefits (independence, increased participation) of PA after the cancer diagnosis.

*"Our body remains good. Difficulty in walking will be less, don't feel the fatigue, feel less tired, keeps your brain fresh."(p1)*

*"Our body does not gain weight, right? Secondly, our body remains energetic a bit, and if we do it, whatever little problems we have in our body will be eliminated…. we feel relief in it, so we must do activity."(p3)*

*"It feels good to exercise. At least for me, doing exercise is the only cure for this pain, so I exercise regularly. The benefit of this is that I don't have to take pills…."(p10)*

Participants understand the negative consequences if they stop PA, and believe in its importance for overall health and well-being.

*"If we do not exercise, we become sedentary. If there is no exercise, the disease will increase."(p4)*

*"If you stop, you will have more problems in your body. Being active… keeps our body healthy, may our whole day be cheerful too… Get along with everyone."(p1)*

One participant emphasized the body's need for both continuing PA and rest in between to avoid wear and tear to the body because of continued work.

*"Continuing work can also be harmful (laughter) as well as beneficial. Wear and tear of the body can occur,*

*right? The body needs rest as well. Full rest is required. Rest during the day is necessary, along with that, physical activity is also necessary."(p5)*

**Source of information for PA**

The majority of WhBC were advised to continue PA by their HCPs, including onco-surgeons/physicians and physiotherapists. They considered advice by the HCPs, along with educational materials (pamphlets/online resources), media outlets, and peer-to-peer knowledge sharing within the WhBC community as the main source of knowledge.

*"There was a patient... and she was doing her exercises, the same exercises I used to try at home on my own. Initially, I was not able to raise my hands...but that lady showed me that..."(p1)*

*"I was given a paper to exercise... I used to exercise accordingly."(p6)*

*"Doctors, they also referred me for physiotherapy, then I watch many programs and all... Youtube and I read the newspaper. I'm also suggesting others to exercise."(p12)*

*"I was also reading online in my own way."(P18)*

**Perceived effects of cancer and its treatment**

Many WhBC had to struggle with a combination of physical and psychological problems after being treated, such as fatigue, pain, increasing weight, mood disturbances, and digestive issues. These were the primary reasons leading to reductions in PA. Besides these, the positivity of most participants stands out as they pledged to be physically active despite any limitations.

*"Yes, my entire body hurts... I get tired from working. It feels like it would have been okay if it wasn't for the cancer. This pain lasts for a long time and sometimes I have to rest for days. There is trouble even with walking and even with housework."(p10)*

*"Yes. It has reduced, so when I feel a little stressed, I stop working. I cannot do it efficiently anymore. I quickly get tired. I have gained weight. When I had my third chemo, after that, I got a bit depressed, had hair loss and all... it does not get out of the mind that I am a cancer patient..."(p18)*

**Optimism and beliefs in PA**

Although most of the participants revealed a positive attitude toward PA, a small part of them expressed fear that discomfort might arise. There was a participant who confessed she had been skipping activities that involved carrying weight with her affected arm because she was afraid it would make her feel worse internally.

*"Exercise motivates me to keep going by inspiring me with where to focus."(p5)*

*"....I believe that I am a survivor and now I am mentally strong...!"(p18)*

*"I'm afraid it might cause some pain inside. I even wash all the clothes. But still I don't lift weight with this hand. I only use my unaffected hand, while lifting, brushing and washing clothes,..."(p13)*

**Challenges in PA engagement**

Considering household chores as the main PA, WhBC did not take part in any structured exercise programs as reported by them; however, many were interested in participating to maintain an active lifestyle. Considering various physical limitations, logistical challenges, and time constraints, the majority of participants preferred home-based activities, especially walking.

*"My legs hurt and I have no one to carry me. And my house is inside the road, so I have to go out quite a long... we have a car at home, but there is no one at home... many times I have to call a rikshaw driver known to me... he also does not come... so I cannot do anything on a*

*regular basis by going out.... I prefer to do it at home."(p8)*

*"I have a completely busy life and afterwards tuitions are also there, so till seven I am completely packed up. And even after that I have some night work then I am free. But if there is an exercise program, then I will prefer to do it at home."(p12)*

Many of the participants had financial constraints as the major reason to favor home-based exercise programs. Apart from worries of extra expenditures for transportation, they also questioned the cost of exercise programs.

*"Home, it won't be convenient for us if there is any fee or money in the centre outside."(p5)*

*"At home only. I need to pay fifty rupees for travel daily, and here also I have to pay fifty rupees, so I cannot afford to spend a hundred rupees a day."(p7)*

*One of the participants also admitted that decisions to carry out PA often change due to people's negative thoughts about post-cancer recovery.*

*"People will say that the operation has been done and going out and walking…so I prefer to stay at home, not going out."(15)*

**Preferences for PA engagement**

Participants showed diverse preferences in PA, with exercise modes varying in type, frequency, duration, and time of the day. The most preferred activity for WhBC was walking, along with several other exercises targeting the upper body and legs, sometimes including weights. Interest in dancing and jogging was also expressed by one of the participants. Modifications to their routine exercises were also preferred by a few.

*"Walk, leg exercises, with weights… we will do whatever you say."(p2)*

*"Shoulder exercises and walk a little."(p8)*

The majority of WhBC expressed interest in taking a few minutes each day for oneself and preferred daily fitness regimens that they could easily fit into their schedules. Most of the participants preferred to undertake exercises individually at their homes, with very few opting for doing it in groups.

*"I can take out ten-fifteen minutes for myself every day."(p5)*

*"I'd rather do it individually. In the individual, we can have the treatment very systematic."(p3)*

*"I can do it alone, but it is better to be in a group."(p2)*

**Context and support for PA**

This refers to the environment where WhBC preferred to carryout PA and to the need for guidance or supervision. Though the majority preferred to perform PA on their own without any supervision or company, a smaller group asked for the availability of exercise partners or supervision.

*"I don't need anyone to be with me…"(p1)*

*"Yes, it would be better if we do it under supervision. Can we get some help in that… Will help in case not able to perform it."(p3)*

**Influences and guidance in PA decision-making**

While some participants preferred choices like pamphlets, videos, brochures, written instructions, and telephone consultations, most participants preferred in-person guidance by HCPs. Some also preferred to do yoga as shown on television.

*"Face to face and demonstrate, video or come and meet in person one day, be learned."(p1)*

*"Personally or through phone."(p2)*

*"In person, or through pamphlet. It will be better if it is taught once in person."(p4)*

*"In writing."(p14)*

*"The brochure will be OK. The video will also be fine."(p18)*

"*From television… from others who do yoga…*" (p16)

## Discussion

The present study offers valuable insights into the knowledge, attitude, and preferences for PA among WhBC. The current study reveals that most WhBC consider housework and daily activities a significant form of PA, and a few include their job, shoulder or leg exercise, walking, and yoga too. The findings reflect how sociocultural norms in India strongly shape women's understanding of physical activity. Most participants linked household chores with being physically active, influenced by traditional gender roles, where domestic responsibilities dominate daily life (unique for a country like India). A dose-response meta-analysis of epidemiological research has shown that household PA and cancer risk are inversely related, with greater household PA levels associated with a 16% reduced risk of cancer than lower ones[30].

Participants believed that an active lifestyle was important to maintain a healthy physical, mental, and social life, thus helping with the course of the disease and survivorship. This is consistent with research showing the value of PA in treating cancer, its side effects, and enhancing QOL[4]. The evidence that frequent PA is essential for the general health and wellness of WhBC is supported by the recognition of the role that PA plays in reducing pain, exhaustion, and mental stress.

Both physical and mental wellness, achieved through PA, motivate WhBC to continue regular PA practices. Participants were aware of the drawbacks of stopping PA. This direct relationship of the positive attitude to a more active lifestyle has been reflected in several studies, relating it to a consequent increase in the QoL in physical, emotional, social, intellectual, and mental domains[31-34].

While a few WhBC referred to other educational resources or heard from other WhBC, the majority of WhBC obtained PA information from their HCPs. This suggests that effective post-cancer health management requires expert advice. HCPs are essential in providing knowledge and tailored PA advice[35]. The literature shows that PA adherence is highly influenced by both HCPs' guidance and the knowledge and beliefs held by WhBC[36,37].

Despite physical limitations, WhBC reflected positive attitudes towards PA. Various barriers, in line with the current Indian literature[26], were identified, which limited participation in structured PA programs, leading to a preference for home-based PA. Financial constraints and logistical challenges were among the reasons for preferring home-based PA programs. Limited autonomy to leave home, dependence on family members for transport, and expectations of caregiving limited participation in structured or outdoor exercise programs. Social perceptions about illness, such as community members discouraging women from going out after breast cancer surgery, further reinforced a preference for home-based and low-cost activity, mainly walking. These patterns highlight the need for culturally responsive rehabilitation models in India. Prior research[31] supports this finding, stating that cost and convenience are among the important factors affecting regular PA practices. Numerous emotional, contextual, physical, and social aspects have also been found in the literature that influence cancer survivors' adherence to physical activity[24], underscoring the necessity of adaptable, customized, low-cost exercise regimens that consider each person's unique needs and circumstances.

### Limitations and future research:

This was a single-centre study conducted on a small sample of WhBC who visited a tertiary care hospital in rural western India using convenience sampling. Variations in clinical practice patterns across different healthcare facilities can significantly impact the care delivery, patient education, and follow-up, which in turn could affect survivors' PA behaviours. Future research should therefore include multicentric or community-based studies to capture a broader representation of Indian WhBC and to evaluate

the effectiveness of culturally adaptable PA interventions for them.

## Conclusion

Indian WhBC understand the importance of PA during survivorship, along with having a positive attitude. They are interested in PA participation, preferably home-based, and primarily walking. The study underscores the importance of integrating flexible, accessible, low-cost PA options into survivorship care. HCPs can better support WhBC in maintaining an active lifestyle and achieving optimal health outcomes by addressing the barriers and preferences identified.

### Clinical implications:

Tailored, preference-based PA programs can assist in overcoming the challenges faced by the WhBC, and enhancing motivation can increase adherence and give them a sense of empowerment. Healthcare providers play a vital role in guiding and supporting survivors toward integrating physical activity into their recovery journey.

### Author contribution statement

All the authors have contributed significantly, and all are in agreement regarding the content of the manuscript.

### Consent to participate

Written informed consent was obtained from all the participants before recruitment for the study. All the participants of the study gave their consent, and their identities have been kept confidential.

### Ethical approval

The research work has been duly approved by the Institutional Ethics Committee-II, Bhaikaka University, Karamsad [IEC/BU/140/Faculty/08/241/2022].

### Presentation(s) or awards at a meeting:

This research was previously presented at the "Physio Zenith 2024 – A National Physiotherapy Conference" held at Gandhinagar, Gujarat, India, on February 23, 2024 and at the 3rd International Multidisciplinary Conference on Cancer Rehabilitation held at Tata Memorial Centre, Mumbai, India, on April 21, 2024.

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## Conflict of interest

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**Supplementary Table 1** Interview guide

| Research area | Interview questions |
|---|---|
| Knowledge | What is your definition of physical activity (PA)? |
| | Are you of the opinion that PA is necessary during survivorship? Why? |
| | Do you know about the advantages of PA during survivorship? Which are those? |
| | Has anybody ever suggested to carry out PA? Who? |
| Attitude towards PA | What does being physically active mean to you? |
| | How cancer diagnosis and undergoing its treatment has affected your daily PA level? |
| | What PA level do you currently hold? What kind of physical activity are you doing? |
| Preferences | Would you like to participate in PA/exercise program? |
| | What type of PA/exercise program would you prefer to participate? |
| | Whom would you prefer to receive PA/exercise instructions from? |
| | How would you prefer to receive PA/exercise instructions? |
| | Where would you prefer to perform PA/exercise? |
| | With whom would you prefer to PA/exercise? |
| | Which kind of PA/exercise would you prefer to perform? |
| | During what part of the week and what time of the day would you prefer to perform PA/exercise? |
| | How often would you prefer to perform PA/exercise? |
| | How intense would you like the PA/exercise to be? |
| | Would you like to have a "helper" during the program? Whom would you prefer to be with? |
| | Would you like to perform exercise under supervision? |

PA=physical activity