A cross-sectional comparison of quality of life between physically active and underactive older men with prostate cancer

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A Cross-Sectional Comparison of Quality of Life between Physically Active and Under-active Older Men with Prostate Cancer

Abstract

Men with prostate cancer experience many side effects and symptoms that may be improved by a physically active lifestyle. It was hypothesized that older men with prostate cancer who were physically active would report significantly higher levels of quality of life (QOL) as assessed by the WHOQOL-BREF and the WHOQOL-OLD. Of the 348 prostate cancer survivors who were invited to participate in the present postal survey, 137 men returned the questionnaires. Those who were physically active had significantly lower prostate specific antigen (PSA) scores and higher social participation than those insufficiently active. These findings offer some support for the benefits of physical activity (PA) within the prostate cancer population in managing the adverse side effects of their treatments on aspects of their QOL. Future research should more closely examine what types of PA best promote improvements in varying aspects of QOL and psychological well-being for prostate cancer survivors.

Key words: physical activity, quality of life, prostate cancer, cancer survivorship, older men.

Prostate cancer represents a significant global public health burden and is the most prevalent form of diagnosed malignancy for men in many countries (Australian Institute of Health and Welfare & Australian Association of Cancer Registries, 2010). Worldwide, close to 800,000 new cases of prostate cancer are diagnosed every year (American Cancer Society, 2014). Improvements in early detection and advanced treatment regimens have resulted in very high five-year prostate cancer survival rates of close to 90%, with 53,296 Australian men still alive five years post-prostate cancer diagnosis (Ahmadi & Daneshmand, 2013).

Monitoring of prostate specific antigen (PSA) levels is commonly used for screening prostate cancer and as an indicator of cancer progression (Ornish et al., 2005). PSA is a protease produced by epithelial cells in the prostate gland. Most healthy men have PSA levels under 4 ng/mL, and one in three men with a PSA level between 4 and 10 ng/ml have a confirmed diagnosis of prostate cancer (Frattaroli et al., 2008). For those men diagnosed with prostate cancer, any increase in PSA level is typically considered a progression of the cancer and as such may require additional treatments to combat the cancer.

Common treatment modalities for prostate cancer include external beam radiotherapy, radical prostatectomy, brachytherapy, androgen deprivation therapy (ADT) and chemotherapy (Chipperfield et al., 2013). While each of the available treatment options can reduce cancer progression and increase cancer survival rates, they may also result in significant morbidity, symptoms and side effects. These adverse effects may include reduced muscle mass, strength and functional capacity, as well as increased body fat levels, fatigue and risk of cardiovascular disease and falls (Windsor, Nicol, & Potter, 2004; Carmack Taylor et al., 2006; Culos-Reed et al., 2010). Ultimately these adverse effects may negatively impact on varying aspects of the quality of life (QOL) of prostate cancer patients (survivors) (Tamburini, 2001).

According to Rejeski, & Mihalko (2001), QOL is a multidimensional construct that

can be broadly categorized into health-related and global QOL. Unfortunately, the distinction between health-related and global QOL is not always well articulated in the research literature and this may be one of the reasons for the potential equivalence in the literature for the effect of physical activity (PA) on QOL in a range of older patient groups (Rejeski, & Mihalko, 2001). Health-related QOL is commonly examined in health and medical research. It can be considered synonymous with health and functional status and is typically concerned with how aging or chronic disease may alter a patient's functioning and overall health. Alternatively, global quality of life is more concerned with a person's cognitive judgement of satisfaction with their own life.

Many prostate cancer survivors report significant reductions in health-related and global QOL. For example, these men can experience significant sexual dysfunction, incontinence and fatigue that reduces their ability to engage in meaningful physical and social activities as well as maintain intimate relationships with their significant others (Hamilton, Chambers, Legg, Oliffe, & Cormie, 2015; Keogh, Patel, MacLeod, & Masters, 2013; Wenger & Oliffe, 2013). Attenuating the adverse side effects of prostate cancer treatment is therefore desirable, and is therefore becoming a greater focus within the field of cancer survivorship (Ahmadi & Daneshmand, 2013).

The therapeutic value of the implementation of PA as a tool to ameliorate the adverse side effects of cancer treatment and to enhance QOL has been receiving heightened research attention (Keogh & MacLeod, 2012). A systematic review by Keogh and MacLeod (2012) found that PA, especially within a group-based setting, significantly improves body composition, physical fitness, functional performance, varying aspects of QOL, and fatigue for prostate cancer survivors. Regular PA may also reduce prostate cancer progression (as demonstrated by relative maintenance of PSA levels) that minimizes the need for additional, potentially harmful prostate cancer treatment for up two years (Frattaroli et al., 2008; Ornish et al., 2005). Despite some evidence of the benefits of PA on the QOL of prostate cancer

survivors, the overall literature remains somewhat equivocal. For example, some studies report no significant improvements in aspects of QOL after an exercise program (Bourke et al., 2011; Carmack Taylor et al., 2006), while other studies have found significant improvements (Culos-Reed et al., 2007; Culos-Reed et al., 2010; Keogh & MacLeod, 2012; Segal et al., 2003). The relative equivalence of these QOL findings within the PA literature may reflect the type of QOL assessed in the studies. Specifically, this may reflect the assessment of health-related vs global QOL as well as the variety of questionnaires used in determining each of these categories of QOL (Tamburini, 2001). Examples of this wide variety of QOL tools used in studies involving prostate cancer survivors include the Short Form Health Survey (SF-36) (Carmack Taylor et al., 2006), Functional Assessment of Cancer Therapy (FACT-P) (Bourke et al., 2011; Segal et al., 2003), the European Organization for Research and Treatment in Cancer Health-Related Quality of Life Questionnaire (EORTC QLQ C30) (Culos-Reed et al., 2007; Culos-Reed et al., 2010) and more recently the World Health Organisation Quality of Life - BREF (WHOQOL-BREF) (Keogh et al., 2010; Keogh, Krageloh, et al., 2013). While all these QOL tools assess somewhat different aspects of health-related or global QOL and have demonstrated validity and reliability in a variety of populations, the WHOQOL-BREF and the WHOQOL-OLD tools may have some additional advantages over the other tools. Advantages include providing cross-cultural validity and including questions that assess not just the presence of side effects and symptoms, but also the participants' satisfaction with their life (Skevington, 2002). Additionally, as approximately two thirds of men diagnosed with prostate cancer are 65 years or older, the WHOQOL-OLD provides additional insight and understanding of the QOL issues pertinent to aging and how these age-related changes may interact with their cancer diagnosis and treatment (Nelen, 2007; Peel, Bartlett, & Marshall, 2007).

The WHOQOL-OLD has not been previously used in conjunction with the WHOQOL-BREF in assessing the impact of PA within the prostate cancer. Specifically, the

items contained within the WHOQOL tools may better enable researchers to differentiate between a participant's list of side effects, the symptoms that they experience, and their perception on the relative influence (from minor to major) that these side effects have on their QOL (Skevington, 2002).

Given the equivocal results in the current literature, the primary aim of this study was to use a cross-sectional, case-control design to gain further insight into the relationship between PA and various QOL domains, as assessed by the WHOQOL-BREF and the WHOQOL-OLD in older men with prostate cancer. It was hypothesized that men who were physically active would report significantly higher levels of QOL, as assessed by the WHQOL-BREF and the WHOQOL-OLD.

Methods

Research Design

This study was a cross-sectional comparison of a variety of QOL constructs in prostate cancer survivors with varying PA levels. While aspects of this data set have been published previously (Keogh et al., 2010; Keogh, Krageloh, et al., 2013), the data analyses conducted and results presented in this paper are novel and have not been previously published. Inclusion criteria for this study involved a confirmed diagnosis of prostate cancer by an urologist and that the participant was a patient within either of two hospitals within a major New Zealand city. This study received ethical approval from the Auckland Regional Ethics Review Board, formally known as Northern Y Ethics Committee, and the Auckland University of Technology (AUT) Ethics Committee, New Zealand. All participants provided written informed consent prior to participation.

Sample

During 2009 and 2011, participants were recruited using a convenience sampling method. The registries of two hospitals based in New Zealand identified men with prostate cancer. Using the database of two hospitals in the major New Zealand city, 348 men were invited to

partake in the study. Participants were eligible if they had histologically documented prostate cancer (at any stage) and had currently been on ADT for at least six continuous months or had never been on ADT. No participants were deemed eligible to participate in this study if they had started ADT within the previous six months. This exclusion was applied because it appears the greatest rate of ADT-related change in body composition, physical function and QOL occurs within the first six months of ADT (Galvao et al., 2008; Spry et al., 2006).

Procedure

The data collection procedure undertaken for both the 2009 and 2011 data sets were identical. An initial letter of invitation was sent to all participants who met the inclusion criteria. The initial mail out included a cover letter that explained the study's aim and how they could voluntarily partake. One week later, a package was sent to participants containing a detailed participation information sheet, the self-administered questionnaires, and a pre-paid return-addressed envelope. To maximize response rates, a second questionnaire package was distributed two to four weeks after the initial mail out to those who had not yet completed the questionnaires.

Outcome Measures

WHOQOL-BREF. The WHOQOL-BREF is a 26-item health-related QOL measure developed by the World Health Organisation Quality of Life Group (WHOQOL Group, 1998). The instrument consists of the following QOL domains: physical (7 items), psychological (6 items), social (3 items), environmental (8 items) and two general items, probing global QOL and self-assessed health. The WHOQOL-BREF has been designed primarily for assessing QOL at a population level in research studies. Construct validity of the WHOQOL-BREF has been demonstrated when compared to the following instruments SF-36, EQ-5D and SF-12 as criterion measures (Murphy, Herrman, Hawthorne, Pinzone, & Evert, 2000). All four domains of the WHOQOL-BREF demonstrate good internal

consistency and excellent test-retest reliability (Murphy et al., 2000). The WHOQOL-BREF has been validated for use in older adults and for the general adult population of New Zealand (Krägeloh et al., 2013).

WHOQOL-OLD. The WHOQOL-OLD is an optional module that is used to supplement the information provided by the WHOQOL-BREF (Peel et al., 2007). The WHOQOL-OLD scale includes six facets with each containing four items. To minimize response burden, only three facets, namely autonomy (4 items), social participation (4 items) and death and dying (4 items) were assessed. Members of the research team in consultation with the cancer clinicians selected these three facets as they were deemed the most relevant to the study sample and research question.

Rapid Assessment of Physical Activity (RAPA). The RAPA scale assesses the PA levels of adults 50 years and over by requiring participants to respond using a yes or no response to a series of nine questions (Topolski et al., 2006). The RAPA1 sub-scale consists of seven questions, which assess the level of aerobic activity from inactive to active. The RAPA2 sub-scale consists of two questions, which assesses whether the respondent engages in strength and flexibility training, respectively. Following the methods of Keogh et al. (2010), participants were classified as being *physically active* if they answered "I do 30 minutes or more of moderate physical activities, five or more days a week" or "I do 20 minutes or more a day of vigorous physical activities, 3 or more days a week" within the RAPA1 sub-scale (Topolski et al., 2006). All the other participants were classified as being *physically under-active* (Keogh et al., 2010). The respondents received a RAPA2 score of zero if they did not engage in either muscle strength or flexibility exercises, a score of one if they engaged in muscle strength, and a score of two if they engaged in flexibility exercise once a week or more.

Statistical Analysis

Prior to statistical analysis, the three negatively worded WHOQOL items were reverse

coded so that a higher score represented higher QOL. Additionally, due to the small sample size, missing items were imputed by the mean score of the non-missing items, on the specific WHOQOL domains for the same participants. Missing items were not imputed when more than half of the items on the domain were missing; in which case no domain score was calculated for that participant. To continue with consistency of the ordinal 5-point structure of the scale, imputed scores were rounded up from 0.5 and all other scores were rounded down. A statistical analysis was conducted using Statistics Package for the Social Sciences (SPSS) version 22. Significance was accepted at $p \leq 0.05$.

Differences between the physically active and under-active groups were compared initially using an Analysis of Variance (ANOVA) for all continuous variables and with a chi-square analysis for all categorical variables. Follow-up analysis used an Analysis of Covariance (ANCOVA), controlling for the previous participant demographic details i.e. age, PSA and time since diagnosis. An ANCOVA was chosen as it eliminates systematic bias when comparing self-selected groups, such as physically active and under-active and as it reduces group or error variance (Miller & Chapman, 2011).

Furthermore, a rank analysis of covariance was undertaken to confirm the results provided from the parametric analysis. This approach follows the recommendations of Krägeloh et al. (2013) who asserted that WHOQOL data are most appropriately analyzed using nonparametric statistics. The Quade's test is a nonparametric alternative for comparing groups, and is an extension of the Wilcoxon signed rank for paired samples (Miller & Chapman, 1983). In order to conduct the Quade's test, dependent and independent variables were ranked, using the SPSS rank procedure (Quade, 1967). A linear regression was conducted for each dependent variable by using the ranks of the dependent variables as the outcome variable and the ranks of the co-variants as predictor variables. A *t*-test of the resulting non-standardized residuals, comparing the physically active and under-active groups equated to Quade's nonparametric test.

Due to a previous planned comparison to assess the effects of adherence to PA on sexual functioning and fatigue, three specific WHOQOL-BREF questions were analyzed separately. These questions included: “Do you have enough energy for everyday life?”, “How satisfied are you with your personal relationships?” and “How satisfied are you with your sex life?”. The additional analysis of these questions enabled further insight into the understanding of PA on increasing sexual functioning and reducing fatigue levels in prostate cancer survivors.

Results

Participant Characteristics and Clinical Markers

Of the 348 men that were invited to participate in the study, 137 men returned the questionnaires, resulting in a response rate of 39%. Participants were classified as either being physically under-active or physically active based on their responses to the RAPA1 sub-scale. Descriptions of the participants based on these groupings are shown in Table 1.

Quality of Life

The initial ANOVA analysis indicated that the physically active group were significantly younger, had lower PSA scores and greater physical QOL and social participation than the physically under-active group. The ANCOVA ($F(1,107)=5.19$, $p=0.02$); Quade ($F(1,107)=4.91$, $p=0.02$) tests found that the only significant difference was the greater levels of social participation. The effects of the variables explained very little overall variation in the social participation sub-scale of the WHOQOL-OLD. Additional analysis was performed to control for participation domain, ANCOVA ($F(1,135)=11.32$, $p=0.01$). Additionally, the PSA variable was the only co-variant that appeared to significantly influence the level of social participation, with higher PSA values associated with reduced levels of social participation ANCOVA ($F(1,110)=5.49$, $p=0.02$).

Fatigue

There was no significant difference in fatigue levels between the physically under-active and

physically active groups, ANCOVA (F(1,108)=0.08, p=0.76); Quade (F(1,108)=0.19, p=0.65).

Personal relationships and Sexual Function

The results indicated no significant difference on personal relationships, ANCOVA (F (1,108)=0.07, p=0.77); Quade (F(1,108)=0.06, p=0.79), or sex life, ANCOVA (F (1,108)=0.01, p=0.92); Quade (F(1,108)=0.01, p=0.92) between the two groups.

Resistance and Flexibility

The chi-square test indicated that the physically active group had significantly greater participation in resistance (strength) activities (X (1, 128)=8.66, p<0.001) than the physically under-active group. There was no significant difference in flexibility (X (1, 128) =3.12, p=0.07) activities between the two groups.

Insert Table 1 here

Discussion

Prostate cancer survivors often live with several cancer-related symptoms that may affect many aspects of their QOL (Hamilton et al., 2015; Keogh, Patel et al., 2013; Wenger & Oliffe, 2013). As a number of these symptoms may be improved by PA, this study sought to compare a variety of forms of PA and aspects of QOL in active and under-active prostate cancer survivors.

The primary findings of the current study were that being physically active (i.e. performing at least 150 minutes of moderate PA or 60 minutes of vigorous PA per week) was associated with significantly reduced PSA scores and significantly greater social participation than the physically under-active group. In contrast, none of the four WHOQOL-BREF domains (physical, psychological, social and environment), three specific WHOQOL-BREF questions (sex life, personal relationships, energy for everyday life) or

two of the three WHOQOL-OLD facets (autonomy, and death and dying) were significantly different between the groups. When age, PSA levels and time since diagnosis were controlled for by using the ANCOVA and the Quade tests, the only significant difference was that the physically active group had significantly higher perceived social participation compared to the physically under-active group.

While the relative lack of QOL benefits for the physically active group was somewhat surprising, the significantly greater perception of social participation for the physically active group was of considerable interest. Physical activity may enhance social dissipation commonly experienced by prostate cancer survivors due to cancer treatment side effects. Studies have found that PA can reduce treatment side effects including reduced physical functioning, perceptions of masculinity, fatigue, incontinence (Hamilton et al., 2015; Keogh & MacLeod, 2012; Windsor et al., 2004; Wenger & Oliffe, 2013). These direct effects of PA may therefore allow these men to re-engage in meaningful social activities. Epidemiological studies suggest that social participation may be particularly important for the health and well-being of older adults (Adams, Leibbrandt, & Moon, 2011; Craike, Livingston, & Botti, 2011). Furthermore, previous studies have shown that engaging in a health-promoting behavior such as PA can be seen to promote and provide an opportunity for meaningful social interactions (Craike et al., 2011; Gilmour, 2012). Being socially active provides the promotion of self-efficacy and a sense of meaning and purpose (Gilmour, 2012; Penedo & Dahn, 2005).

Physical activity within the prostate cancer population enables social support and therefore, can be thought to be a facilitator of health and well-being. Improvements in social participation on the WHOQOL-OLD domain, however, did not coincide with a significant increase in the WHOQOL-BREF social domain in the current study. Closer inspection revealed that the WHOQOL-BREF social domain questions were predominantly focused on personal relationships and sex life, with only one question concerned with social support.

This limiting focus was one of the reasons underlying the creation of the WHOQOL-OLD and why it was selected to complement the WHOQOL-BREF in the current study involving older prostate cancer survivors. On this basis, we would recommend the inclusion of the WHOQOL-OLD in addition to other more health-related QOL tools for studies involving older cancer survivors.

The relative equivalence in the variety of QOL domains and facets between the physically active and under-active group in the current study was inconsistent with our initial hypotheses but somewhat consistent with the overall literature (Bourke et al., 2011; Carmack Taylor et al., 2007). This relative equivalence of the literature may reflect a variety of between-study differences. One potential answer reflects the wide variety of health-related QOL and relative lack of global QOL tools used in the prostate cancer literature. Another potential answer is that many cancer survivors who have had their symptoms for many months or years become accustomed to the symptoms, and therefore no longer perceive these issues as significantly affecting their QOL (Hamilton et al., 2015). A third possible answer reflects the definition of physically active and/or the variety of PA performed within the literature (Keogh & MacLeod, 2012).

At the time of the study, physical activity guidelines for cancer survivors involved the performance of 150 minutes of moderate or 60 minutes of vigorous aerobic exercise per week. The guideline of what constitutes sufficient PA for cancer survivors has also been updated since the collection of data for this study, with the American Cancer Society now recommending that cancer survivors also include resistance (strength) training exercises at least twice a week (Rock et al., 2012). Resistance training is the optimal exercise prescription for increasing muscle mass, strength and endurance, all of which significantly decline with a number of common prostate cancer treatments including ADT (Beydoun et al., 2014; Keogh & MacLeod, 2012; Segal et al., 2003). Lower rates of physical activity and QOL in the physically under-active prostate cancer group may stem from the negative body

composition and muscular function changes associated with prostate cancer treatment. Resistance training may therefore be an integral part of the PA promotion message for men with prostate cancer, especially those on ADT (Keogh et al., in press). It should be noted, however, that in the present study the data from the RAPA questionnaire that resistance training was uncommon in both groups, with less than one quarter of the physically active group performing even one session of resistance training per week. It could therefore be argued that if more of the physically active men with prostate cancer also performed regular resistance training, the between-group differences in QOL may have been more pronounced.

The physically active group's significantly lower PSA levels were also of major interest as PSA predicts clinical progression of prostate cancer (Ornish et al., 2005). Previous studies have also shown that a change in serum PSA to be one of the strongest determinants for assessing the outcomes of any prostate cancer treatment (Frattaroli et al., 2008; Ornish et al., 2005). Previous research has also demonstrated that physically active prostate cancer survivors had a slower prostate cancer progression and could therefore delay undergoing prostate cancer treatment (i.e. utilize active surveillance) for up to two years with no adverse side effects (Frattaroli et al., 2008; Ornish et al., 2005). The lower PSA levels for the physically active group would provide additional support that PA within the prostate cancer population has benefits beyond physical performance and QOL outcomes.

There are several limitations inherent to this study. Firstly, when undertaking survey based studies the issue of how representative this sample is of the population is always of some concern. The calculated response rate of 39% was comparable to other studies within this area of research (Bestmann et al., 2007), although it may somewhat underestimate the true response rate due to some of the older men changing residence or passing away prior to receiving the letter of invitation. Nevertheless, the generalizability of this data could be affected by participation bias, whereby the men that chose to take part were more likely to be physically active than the general prostate cancer population. As we were unable to

obtain demographic data on the non-responders, the potential for this participation bias cannot be discounted.

It is not possible to determine causation in a cross-sectional comparison and therefore, differences in QOL may have been influenced by the group's perceptions of QOL and/or PA levels prior to cancer diagnosis and/or treatment. The physically active and under-active groups were not matched according to disease characteristics, pre-cancer PA levels or self-reported QOL or health and therefore, differences between groups relied on statistical control of covariates. Finally, the outcome measures used were self-report inventories of PA and QOL and consequently, participants may have under- or over-stated their level of PA, or their current perceptions of QOL.

Future research in this area should use more objective PA measures such as accelerometry and make a clearer distinction on the use of global vs health-related QOL tools. Some of this research should use a longitudinal research design and a mixed-method data collection approach to enable a clearer understanding on the effect of PA on QOL outcomes in the prostate cancer population. Previous qualitative studies around PA and adherence to PA have focused predominantly on participants' motivation as well as perceived barriers, benefits and risks to engaging in PA (Craike et al., 2011; Keogh, Patel, et al., 2013; Keogh et al., 2014). Prostate cancer survivors in these studies have spoken of how PA provided them with an embodied confident sense of self and how it reduced their feeling of anxiety regarding their cancer treatment related side-effects and disease progression (Craike et al., 2011; Hamilton et al. 2013; Keogh, Patel, et al., 2013; Keogh et al., 2014). Additionally, future research may wish to further investigate the dose response between resistance training and changes in QOL for a variety of prostate cancer groups. Interventions to increase resistance-based PA for prostate cancer survivors may need to consider the co-morbidities associated with older age, treatment side effects and the common barriers, motives and facilitators to this form of exercise (Craike et al., 2011; Hamilton et al., 2015;

Keogh, Patel, et al., 2013; Wenger & Oliffe, 2013).

Conclusions

Due to the very high five year survival rates for cancers including that of the prostate, more research is now focusing on the wider issues of cancer survivorship rather than just how to reduce mortality rates (Australian Institute of Health and Welfare & Australian Association of Cancer Registries, 2010). A major focus of this wider cancer survivorship research is better understanding how the regular performance of healthy behaviours like PA may impact various aspects of the survivors' health and QOL.

Overall, the results of this study indicate that those who were physically active had significantly lower PSA levels and higher social participation than their under-active peers. Both of these results are major findings indicative of the benefits of PA for men with prostate cancer. While the lack of significant differences within the other QOL domains was contrary to our hypothesis, these findings still provide useful information to direct future research. In particular, these findings may be used to further guide researchers and cancer clinicians in regards to the importance of promoting PA within the prostate cancer population so to better manage some of the adverse side effects of treatment regimens.

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Table 1

Clinical descriptors of the two groups of participants

	Physically Under-active (n=63)	Physically Active (n=74)
Age (years) *	75.9 (9.6)	72.5 (9.9)
PSA (ng/mL) *	9.5 (23.6)	2.8 (6.3)
Time since diagnosis (years)	5.9 (4.0)	5.1 (2.9)
Duration of ADT (years)	4.6 (3.9)	4.1 (3.1)
Number of current ADT users	37 [58.7%]	32 [43.2%]
Engage in Flexibility training	9 [14.3%]	19 [25.7%]
Engage in resistance training^	3 [4.8%]	16 [21.6%]
Physical QOL*	25.0 (4.6)	26.7 (5.0)
Psychological QOL	22.8 (3.6)	23.8 (3.6)
Social QOL	11.5 (2.6)	11.7 (2.5)
Environmental QOL	32.0 (4.6)	33.1 (4.1)
Sex Life	3.5 (1.1)	3.5 (1.3)
Personal Relationships	4.0 (0.9)	3.5 (1.3)
Energy for everyday life	3.7 (0.9)	3.9 (0.8)
Autonomy	15.9 (2.7)	16.2 (2.7)
Social participation* †‡	13.4 (3.3)	15.2 (3.0)
Death and Dying	11.9 (3.1)	12.1 (3.0)

Note. All values shown in the table are means and standard deviations, with the exception of the prevalence of ADT usage, flexibility and resistance training, which are total numbers and percentages, as shown in [].

*Significant difference ($p < .05$) between the two groups based on the ANOVA analysis

^ Significant difference ($p < .05$) between the two groups based on the chi-square analysis

† Significant difference ($p < .05$) between the two groups based on the ANCOVA analysis

‡ Significant difference ($p < .05$) between the two groups based on the Quade analysis