

# Resistance Training and Older Adults' Beliefs About Psychological Benefits: The Importance of Self-Efficacy and Social Interaction

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The purpose of this study was to determine the perceived psychological benefits and explore the mechanisms underlying the link between exercise and psychological well-being for a group of older adults (65–72 years; 6 women; 4 men) who participated in a 12-week program of moderate-to-high intensity resistance training. They were interviewed in-depth at 1 week preintervention, 1 month after commencement, and 1 week after completion. The participants believed that resistance training enhanced their well-being, and they gave various physical, mental, and social reasons to explain this link. In particular, self-efficacy and social interaction were found to be key mechanisms underlying this relationship. This study exposed meaningful perceived improvements in psychological well-being that have not been uncovered in quantitative studies of healthy older people undertaking resistance training. The findings highlight the importance of using qualitative methods to enrich understandings of the positive effect of exercise on psychological well-being. The findings also have implications for designing effective resistance training interventions for older people.

**Key Words:** exercise, well-being, aging, health promotion

The aging process is commonly associated with a substantial decline in physical (Brandon, Boyette, Lloyd, & Gaasch, 2004) and psychological (McAuley & Rudolf, 1995, p. 71) functioning and an increased dependence on the health care system. Given the aging of Australia's (and the developed world's) population, improving the physical, mental, and social health of older people is a priority (Kolt, Driver, & Giles, 2004). Research indicates that habitual exercise has the potential for many health benefits for older people, such as improved fitness, strength, flexibility, and balance; enhanced mood and perceived quality of life; a sense of life satisfaction; opportunities for social interaction; improved self-concept, self-confidence, and cognitive functioning; positive self-esteem, and decreased levels of stress, anxiety,

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and depression (Biddle, Fox & Boutcher, 2000; Biddle & Mutrie, 2001; Chodzko-Zajko, 2000; Netz, Wu, Becker, & Tenenbaum, 2005; O'Brien Cousins & Horne, 1999; Shephard, 1997). Therefore, the promotion of regular exercise to older adults has been recognized as part of the strategy to improve Australia's (and other developed countries') overall health outcomes (Commonwealth of Australia, 1999).

## Resistance Training and Older Adults

Resistance (or strength) training is one type of exercise intervention for older people that generally results in substantial improvements in muscular strength and an enhanced ability to perform activities of daily living, such as walking, climbing stairs, carrying groceries, and rising from a chair (Hunter et al., 1995). Improved functional ability contributes to a person's independence, quality of life, and well-being (Spirduso & Cronin, 2001). Although resistance training has the potential to improve or maintain overall well-being in older people, such psychological benefits have been less consistently demonstrated than have physiological changes (Perrig-Chiello, Perrig, Ehram, Staehelin, & Krngs, 1998). Psychological well-being is a multifaceted phenomenon that incorporates emotional well-being, self-perceptions, bodily well-being, and global life satisfaction (Netz et al., 2005). Psychological well-being is generally understood as the presence of positive components (cognitive function, positive affect, self-efficacy, self-esteem) and the absence of negative components (anxiety, depression, stress-related emotions) (McAuley & Rudolf, 1995).

The majority of research about resistance training among older people focuses on the physiological effects of an exercise intervention (see Dionigi, 2005). For instance, many studies have shown that, with moderate-to-high resistance training, older adults experience improved strength or prevented muscle wastage, and have less chance of falling or developing disabilities or age-related diseases (e.g., diabetes mellitus, arthritis, coronary heart disease, osteoporosis) (Hurley & Roth, 2000; Tseng, Marsh, Hamilton, & Booth, 1995; Winett & Carpinelli, 2001). The physical benefits of long- and short-term resistance training programs for older adults are well established in the literature (Brandon et al., 2004; Cavani, Mier, Musto, & Tummers, 2002; Phillips, Broman, Burkett, & Swann, 2003), yet their link to psychological outcomes requires further examination.

Moreover, the few studies that have explored the psychological outcomes of resistance training in older adults rely predominantly on quantitative methodologies and/or clinically depressed populations (Dionigi, 2005). Studies on the effect of resistance training on mental health in clinically depressed populations (e.g., Singh, Clements, & Fiatarone, 1997) have found significant positive changes in mood and depression ratings, whereas psychological changes in "healthy" older people appear statistically minimal or nonsignificant (McLafferty, Wetzstein, & Hunter, 2004). For example, using the Profile of Mood States, McLafferty et al. found that a 24-week resistance training program resulted in significant improvement in scores for confusion, tension, anger, and total mood, but not for depression, vigor, and fatigue in 28 healthy, sedentary older adults ( $M = 66.9$ ,  $SD = 4.3$ ). However, their qualitative data (open-ended, semistructured interviews with 23 participants) indicated meaningful perceived psychological improvements (e.g., "it changed my life") that could not be detected from the Profile of Mood States. Perrig-Chiello et al. (1998)

studied the effects of an 8-week resistance training intervention on psychological well-being and cognitive functioning in 46 healthy older people ( $M = 73.2$ ). They employed an experimental and control group design and administered personality questionnaires, health rating scales, and a word recognition test 1 week before and after the program. The results showed that an increase in muscular strength was associated with lower levels of anxiety and self-preoccupation; however, there was no significant increase in psychological well-being or subjective health. Similarly, Shaw, Ebbeck, and Snow (2000) found minimal changes in physical self-concept and self-esteem, despite improvements in body composition and physical performance, for healthy postmenopausal women (aged 50–75) in a controlled 9-month resistance training trial.

In retrospect, it is not surprising that the pre- and posttests in the studies mentioned above did not show statistically significant changes given the initial low values of depression, and high values of subjective well-being and self-esteem that are often found in healthy/nonclinical subjects. Alternatively, qualitative data (e.g., from in-depth interviews, observations, and/or participant journals) may expose perceived improvements in well-being for healthy older people undertaking resistance training that are not uncovered when using psychological inventories. Furthermore, qualitative data may provide insight into the key mechanisms underlying the relationship between exercise and psychological well-being.

### **Exercise, Psychological Well-being, Self-Efficacy, and Social Interaction**

In regard to the exercise experience in general (as differentiated from resistance training in particular), there is growing evidence that suggests a positive relationship between exercise and psychological well-being for older adults (McAuley & Rudolf, 1995; Netz et al., 2005; Resnick, 2000). In particular, exercise has been shown to reduce anxiety, depression, and stress and to enhance perceptions of mastery, life satisfaction, and mood for older adults (Chodzko-Zajko, 2000; McAuley & Rudolf, 1995; O'Brien Cousins & Horne, 1999; Stathi, Fox, & McKenna, 2002). A meta-analysis by Netz et al. (2005) and a review by McAuley and Rudolf (1995) revealed the positive association between exercise and psychological well-being in older adults. Netz et al. found that the psychological well-being of older adults without clinical disorders was benefited the most by moderate-intensity exercise and benefited the least by light-intensity exercise. McAuley and Rudolf found that exercise programs longer than 10 weeks consistently reported more positive effects on psychological well-being for older people when compared with shorter programs. Although many mediating physiological, social-environmental, and psychological mechanisms have been proposed for explaining the exercise–well-being relationship, Netz et al. argued that self-efficacy was the most salient variable affecting well-being. McAuley and Rudolf (pp. 90-91) agreed that “one of the most frequently cited psychological explanations has been the mastery experience associated with physical activity.”

Self-efficacy refers to peoples' belief in their ability to perform a particular behavior (Bandura, 1986, p. 391). Netz et al.'s (2005) results indicated that self-efficacy, overall well-being, and view of self were significantly affected by exercise in a positive way. It has been argued that exercise may offer a mastery experience

for older people whose physical self-efficacy might be declining along with their functional abilities (McAuley & Katula, 1998; McAuley & Rudolf, 1995). Self-efficacy has been found to be a critical factor in predicting exercise behavior in older sedentary people, and exercise can influence feelings of efficacy for this population (McAuley & Katula), which in turn leads to enhanced perceptions of psychological well-being (McAuley & Rudolf). Therefore, it is important to understand which aspects of the exercise experience influence self-efficacy. Bandura (1986) identified four principal sources of self-efficacy: performance attainment, vicarious experience, verbal persuasion, and physiological state.

Performance attainment is based on the experience of mastery. If people experience success, their self-efficacy will increase; however, repeated failure will lower self-efficacy appraisals (Bandura, 1986). Repeated success is likely to develop a strong sense of self-efficacy, in which case occasional failures are unlikely to have much effect on peoples' perception of their capabilities. Furthermore, once established, increased self-efficacy tends to generalize to other activities or situations (Bandura). Vicarious experiences (i.e., modeling) raise self-efficacy in observers because they believe that they can master comparable tasks (Bandura). The amount of uncertainty people have about their capabilities and the criteria by which ability is judged are two "conditions under which self-efficacy appraisals are especially sensitive to vicarious information" (Bandura, p. 399). "Verbal persuasion is widely used to try to talk people into believing they possess capabilities that will enable them to achieve what they seek" (Bandura, p. 400), hence, increasing levels of self-efficacy. Finally, one's physiological state provides information in judging capabilities. If people read their bodily states, such as arousal, fatigue, or pain as signs of incapability, their efficacy will decrease (Bandura).

Social interaction (including support and influence) is another key mechanism underlying the relationship between exercise and well-being. Studies have found that self-efficacy expectations serve as a mediator between social support and exercise behavior for older adults (Duncan & McAuley, 1993; O'Brien Cousins, 1995; Resnick, Orwig, Magaziner, & Wynne, 2002). Social support can be provided by family, friends, other exercisers, or the exercise leader. Social support can be instrumental, informational, emotional, or appraisal (Resnick et al., 2002). These behaviors commonly demonstrated as social support are consistent with Bandura's sources of self-efficacy described above. For example, friends, family, other exercisers, or the exercise leader may enhance self-efficacy related to exercise by providing verbal encouragement (i.e., appraisal/verbal persuasion), acting as role models (i.e., vicarious experience), or sharing information about exercise programs (i.e., informational). Resnick et al. explored the relationship between social support, self-efficacy, and outcome expectations on exercise behavior in a sample of older adults and found that "friend" social support was statistically significantly related to exercise behavior and had a statistically significant direct effect on self-efficacy expectations. McAuley, Jerome, Marquez, Elavsky, & Blissmer (2003) found that past mastery experiences, the social milieu, and the affective experience of participation in exercise played both interrelated and independent roles in the production of self-efficacy expectations. Similarly, Deforche and De Bourdeaudhuij (2000) argued that social influences, including modeling and social support (e.g., from a leader, a group, significant others) are important for facilitating self-esteem and personal competence. Therefore, the influence of social interaction on perceived

psychological benefits in general and self-efficacy more specifically presents an interesting link to explore among the older people in this study.

To investigate whether social interaction and self-efficacy emerge as underlying mechanisms of the relationship between exercise and psychological well-being among older exercisers, Netz et al. (2005, p. 282) argued that resistance training is an effective exercise modality for exploring the links between psychological benefits and improved physical function. McAuley and Rudolf (1995, p. 91) called for "multidisciplinary approaches to the study of the physical activity/psychological health relationship that embrace the interaction of [mental, physical, and social] mechanisms" to explain this complex relationship. Furthermore, Krane, Andersen, and Streaun (1997, p. 217) argued that the sport and exercise psychology field needs "to embrace different methodologies and the different forms of knowledge gained from them" if it is to grow and contribute to an understanding of sport and exercise psychological phenomena. Sport and exercise psychology research has its tradition in the quantitative paradigm. Before 1990, qualitative studies in the field were rare, and, from 1990 to 1999, the majority of qualitative research had a positivistic influence (e.g., oral questionnaires or one-shot interviews across multiple subjects and the transformation of verbal accounts into statistics) (Culver, Gilbert, & Trudel, 2003). Stathi et al. (2002) called for qualitative research within the interpretive paradigm to better understand and document the multiple meanings that older adults attach to the exercise experience.

Therefore, this study takes an interpretive qualitative approach to explore the subjective experiences of healthy older people who participated in a resistance training program. In a broad sense, an interpretive paradigm recognizes the subjectivity of lived experience and posits that it is the meaning that individuals attach to their experience that constitutes their reality (Hemingway, 1995; Prus, 1996). From this standpoint, Prus (p. 9) argued that, "the study of human behavior is the study of human lived experiences and that human experience is rooted in people's meanings, interpretations, activities, and interactions." The aim of this study was to determine the perceived psychological benefits of the exercise intervention and to explore the mechanisms underlying the link between exercise and psychological well-being for this group of older adults. Such research addresses the above-mentioned gaps in the literature, has the potential to reveal insights into psychological benefits that are often underreported in quantitative studies, and has practical applications. For instance, understanding the factors underlying exercise behavior in older adults will help to structure interventions to encourage these individuals to begin and to adhere to a regular exercise program.

## Methods

### Participants

Ten participants (aged 65–72 years; six women; four men) were interviewed and observed for this study. They were selected using purposive sampling techniques from a group of 28 volunteers (aged 57–86 years) involved in a resistance training intervention. All 28 volunteers were recruited from the regional town of Bathurst, New South Wales, Australia (population 35,000) via the distribution of flyers at community centers, Veteran's clubs, and the University of the Third Age (U3A;

i.e., educational and cultural programs for seniors). Purposive sampling involves consciously selecting groups, settings, and individuals where and for whom the processes being studied have the most relevance (Denzin & Lincoln, 2000; Glaser & Strauss, 1967; Strauss & Corbin, 1998). Because this study aimed to explore the exercise experiences of healthy older people, purposive sampling was based on age (65 years and over), health status (no major illnesses or injuries, and moderately active), and gender (a mix of men and women). The 10 sampled participants lived independently in the community and were white nonsmokers considered “healthy,” subsequent to completing a pre-health exercise questionnaire (i.e., had no major illnesses or injuries and were moderately active). Each participant was given a pseudonym to ensure anonymity (see Appendix A for a table of participant characteristics). The majority of participants had never tried resistance training. Participants were involved in various recreational and community activities, such as golf, gardening, walking, cycling, lifeball (i.e., a modified version of netball), volunteer work, and U3A.

## The Exercise Intervention

The 28 volunteers engaged in a whole-body resistance training program, including three upper-body (chest press, lateral pull-down, shoulder press) and three lower-body (leg press, leg curl, leg extension) exercises, twice a week (with at least 1 day rest between sessions) for 12 weeks. The program was conducted at a university gym, and each exerciser was assigned a student volunteer who supervised each training session. The students were trained in correct exercise techniques, ethical considerations, and safety procedures. The roles of the student supervisor were to ensure the participants followed the program instructions; to motivate the participants during each exercise session; to lead warm-up and warm-down activities (consisting of stretching all major muscle groups and 10 min of light aerobic activity); to provide spotting for the participants when performing assisted repetitions; and to keep a log of each participant’s progress, including the training load and the number of repetitions and sets completed for each exercise and training session.

The six exercises were performed using plate-loaded exercise equipment at 75% of 1-RM (i.e., the maximum load lifted for one repetition). The 1-RM loads were estimated for all exercises using the maximum-repetition method (Morales & Sobonya, 1996). Participants completed three sets for each exercise and performed 8 to 12 repetitions per set. A single repetition of each exercise included a concentric and eccentric phase. A rest period of 2 to 3 min elapsed between sets and a 5-min rest period elapsed between exercises. Throughout the entire training period, progressive overload was applied by increasing the training load by approximately 5% when the participant was able to complete three sets of 12 repetitions unassisted. This process was to ensure that all participants continued to train at the required intensity. For the 10 sampled participants, exercise adherence throughout the training period was  $98 \pm 2\%$  and their log books indicated that they followed the program’s instructions.

In addition, three information sessions each were conducted for all exercisers and all students at different points throughout the program to discuss how the resistance training program was going and to raise any concerns or questions they had about the program. An introduction meeting (where students were paired with an

exerciser and the exercisers were given a tour of the gym), a recognition luncheon (i.e., a free lunch at a community facility where the students and exercisers socialized and were thanked for volunteering in the program), and a presentation evening (where exercisers and students had refreshments and were given a certificate of appreciation) were held over the course of the intervention.

## Data Collection

To explore the 10 sampled participants' subjective experiences of resistance training, in-depth interviews (from 45 min to 2 hr in length) were conducted by the author with each participant at three stages: 1 week preintervention, 1 month after commencement, and 1 week after the completion. The interviews were one-on-one, face-to-face with the researcher, except for two married couples (Keith and Betty, and Jake and Jan) who were interviewed simultaneously. These married couples preferred to be interviewed together because they felt more comfortable expressing their thoughts and feelings than if they were alone with the interviewer. When compared to the one-on-one interviews, the interviews involving couples consisted of less questioning from the researcher and included more participant interaction and discussion (Rubin & Rubin, 1995). Furthermore, although themes similar to those of the one-on-one interviews emerged, the couple interviews allowed for unique insights on spousal support and exercise to emerge from the data.

Qualitative interviewing relies extensively on verbal accounts of participants' feelings, actions, attitudes, intentions, and opinions (Patton, 1990; Rubin & Rubin, 1995; Taylor & Bogdan, 1998). The general interview guide approach was used (Patton, 1990). That is, the topics for discussion (e.g., exercise history; expectations, apprehensions, benefits, and experience of resistance training; perceptions about the relationship with their student, their body, health, and quality of life; and their intention to continue training) and sample questions were listed in advance (see Appendix B), but the exact wording and ordering of questions was developed in the course of the interview, depending upon what issues were raised by the respondent and how the conversation was unfolding (Patton; Taylor & Bogdan). Therefore, the key topics were explored with all participants, but individual issues and questions not explicitly listed in the guide were able to emerge. Although this flexible approach can reduce the comparability of responses, Taylor and Bogdan argue that, when the researcher is interested in understanding a broad range of perspectives, interviewing multiple informants in a way that is most suitable to that individual actually better "lends itself to building general theories about the nature of social phenomena" (p. 91). Appendix B shows that the interview questions focused on the exercise experience in general, not self-efficacy or social interaction, so that these preconceived theories did not dictate the research findings (see the section on data analysis, below). The data presented in this article were drawn primarily from the latter two interview stages and focused on the participants' perceived benefits of resistance training.

Each interview was recorded and transcribed verbatim. Preliminary analysis was conducted after each stage of interviews so that tentative themes were followed up in all subsequent interviews. This process of allowing previous data to give direction to ensuing data collection is consistent with constant comparative analysis (described in the next section) and theoretical saturation (Glaser & Strauss,

1967). Theoretical saturation is attained through this simultaneous process of data collection and analysis, and it happens when the researcher realizes that the data being collected becomes repetitive and little or no additional relevant data is being found (Glaser & Strauss; Strauss & Corbin, 1998). For instance, by the end of the final stage of interviews, responses similar to those given in previous interviews were heard and very little new data or concepts were emerging. Hence, a point of theoretical saturation (within the aims of this study) had been reached.

Furthermore, the author observed participants in the gym at different points throughout the program, and at the introduction meeting, information sessions, recognition luncheon, and presentation evening. When observing, participant interactions, conversations, and actions were left to unfold “naturally,” with participants being uninterrupted and often unaware of the researcher’s presence (Adler & Adler, 1998). Observations were recorded as field notes in a notebook at the first available private moment. The observations were not intrusive and only used for the purpose of describing the context of the investigation (Patton, 1990).

## Data Analysis

The interview and observational data were initially analyzed inductively through the use of coding, and constant comparative and thematic analyses. An inductive approach to research ensures that the findings remain grounded in the data rather than based on preconceived theories that may be irrelevant (Glaser & Strauss, 1967). However, “pure induction is impossible” (Taylor & Bodgan, 1998, p. 8); thus, a level of deduction occurs when one is consulting previous studies and theories related to the area of research interest. Deductive analysis involves analyzing the data to test preconceived theories or hypotheses (Huberman & Miles, 1998). Therefore, deductive analysis was later employed (i.e., the application of self-efficacy theory and previous research findings) to interpret the themes that emerged from the data.

Initially, all the data were formally coded and compared by breaking the data down into categories of ideas, meanings, and observed events (which were significant to participants), and by labeling them through a process of examination, comparison, and conceptualization (Strauss & Corbin, 1998). After coding, the data were grouped into common topics, called *raw data themes*. Further analysis involved linking similar raw data themes together to generate higher order themes (i.e., into more-refined concepts) (Van Manen, 1998). This procedure was consistent with constant comparative analysis (Glaser & Strauss, 1967). That is, a process whereby data collected from each different method or stage is continually contrasted throughout ongoing analysis in order to develop concepts grounded in the data (Strauss & Corbin, 1998). As data analysis progressed, it became apparent that Bandura’s self-efficacy theory (and related past research findings) provided an effective framework for interpreting the multiple themes that surfaced from the data. This whole process was consistent with the interpretive qualitative approach because the findings emerged out of the data, and the emphasis was on revealing and representing the multiple perspectives of participants, and then making sense of their experiences through the application of theory (Denzin & Lincoln, 2003; Giddens, 1976).

Three main themes—physical changes, a “good feeling,” and “the social side”—each with dynamic and multiple subthemes, emerged from analysis. The



credibility of the findings was verified by asking participants whether these themes accurately reflected their experiences. The six participants who accepted to provide these member checks agreed that the themes represented their experiences. However, qualitative researchers acknowledge that there is always another way to interpret the data because the outcomes of any study are ultimately influenced by the researcher's interactions with participants and theoretically informed decisions regarding the research design, data collection tools, and data analysis (Giddens, 1976).

## Results

The presentation of findings is organized around the three main themes outlined above. These themes highlight the physical, mental, and social factors that the participants believed contributed to their improved psychological well-being as a result of the exercise intervention. Although presented separately, all of these themes interact, overlap, and influence each other. The chosen quotes best represent each particular theme and the most common stories and meanings expressed by the participants.

### Physical Changes

After only 4 weeks of training, many participants reported pleasurable bodily sensations and believed that they had improved strength, endurance, balance, and coordination. These subthemes—bodily sensations and improved physical functioning—are described in the following paragraphs.

***Bodily Sensations.*** Many participants spoke about feeling physically stimulated during and immediately after a training session. Barbara, 69, commented that the exercise, “Just really makes your heart go and your blood pump and you finish feeling quite invigorated, though tired . . . it’s positive . . . you feel your whole body is alive! It’s kind of a tingly feeling all over.” These signs of increased arousal and tiredness associated with resistance training were perceived by the participants as signs of increased strength, vitality, and overall health. For instance, Barbara gave the following reasons for enjoying the program after 1 month: “I suppose just the physical activity itself is good, stimulating, and the potential for strengthening yourself and your lifestyle.” Joe, 68, also experienced satisfying bodily sensations in relation to exercise:

Immediately after the exercise there’s a sort of time of fatigue which seems to pass off quite quickly and then there’s a feeling of tightness, of tone, increased tone in muscle groups which wasn’t necessarily there in the same amount as before and, that’s a good feeling. . . . It’s a pleasant feeling of muscle tiredness . . . the feeling that we were doing something positive about our health I think is a big plus.

These participants, like many, clearly enjoyed the physical feelings associated with their training. Furthermore, this finding demonstrates that the participants realized that their bodies were physically capable of withstanding such strenuous exercise.

**Improved Physical Functioning.** Many participants believed that the resistance training had improved their strength, balance, coordination, and fitness, which positively affected their physical (and mental) functioning and their ability to carry out “normal things” associated with daily living. In other words, it helped them remain independent for as long as possible. For example, Joe believed that “. . . this [resistance training] is a good thing to do and it has been proven useful to do even when you hit 68 you can still sort of, not necessarily become Superman, but try and maintain some of your function.” Sophie, 65, said, “Oh, more secure in my thighs. Yeah, much stronger. And, more confident in walking. Yeah, I felt that fairly quickly [i.e., after 2 to 3 weeks of training] . . . I can worry less about injury if I’m feeling stronger when I stand.” The improved strength and stability that Sophie felt in her legs increased her perceived endurance and confidence levels when going for her routine (i.e., four times per week) 45-min walk. Sophie even noticed a difference in her gardening: “I did a fair bit of gardening yesterday and, it was just a pleasure to, up and down, up and down . . . to have the energy to do it.” Likewise, Donna, 71, said, “Well I just feel stronger. And I must say, golf has improved, my golf swing. . . I think it’s good . . . because I play so much golf I can hit the ball better and I don’t get so tired.” Grant, 67, noticed after 4 weeks of training that he could ride his bike a lot easier: “Yeah, I got an old geared bike, coming up the hills, I’m up one gear to what I used to be, so . . . it’s got to come from this [resistance training].”

After 4 weeks of training, Barbara said,

I found that I can get out of the bath with greater ease. Because it had concerned me that I was starting to find that I really had to sort of push myself up out of the bath . . . but I found I was sort of getting up out of the bath without thinking about it. And it was much easier. So obviously that was a physical improvement.

Similarly, Caroline, 65, explained,

There’s an improvement in my muscles. . . . Because the weights are increasing at the gym . . . also I often lift pavers and things [when gardening] and normally I lift two pavers and I noticed the other day I was carrying a bucket with four in it. . . . So I know that I can lift more at the gym, so therefore my brain says, “Well I can lift more here” [at home]. . . . Because I do have a measure.

For Caroline, the objective feedback she received from lifting more weights in the gym gave her the confidence to lift more things at home because she knew that she was capable of it. Overall, their perceived physical changes increased participants’ confidence and competency in performing other recreational activities and carrying out general activities of daily living.

## A “Good Feeling”

Participants said that involvement in resistance training makes them “feel good” mentally, and gave them a “sense of well-being.” The three main reasons the participants gave to explain this “good [psychological] feeling” were an increased

knowledge, awareness, and efficacy in using the gym equipment; “a sense of accomplishment” in completing the exercise; and a sense of satisfaction in “taking control” of their health. Each reason is discussed in the following paragraphs.

**“I Know How To Do It.”** Donna said that the training “makes me feel good as though I’m still in the land of the living, I’m not too old and stupid.” Resistance training is often stereotyped as being a young persons’ activity, and the majority of participants in this study had never been to a gym or tried resistance training as an older adult. Many older people are not educated in correct training technique or aware of how it can benefit their life (Feigenbaum & Pollock, 1999). Therefore, an important perceived psychological benefit for participants was removing the fear of the unknown by learning “how to do it,” what the machines were called, and which muscles they worked. Donna continued:

Oh, it was really good and I’m going to continue. . . . Oh, I love it! I feel better . . . I’m going to do it forever! That is the plan at the moment. . . . You know, I’ll keep on—because I know how to do it . . . they didn’t have gyms when I was at university. . . . But we’ve learnt to use them and we’re not so scared!

Interestingly, during the introduction meeting, when the older exercisers were having a tour of the gym, the author overheard one of the participants murmur in dismay, “It looks like a torture chamber!” She was referring to all the unfamiliar white exercise machines that were lined up around the room. Furthermore, Caroline said,

Without knowledge, if I was to walk into that gym, like a gym with no supervision, I wouldn’t know what machines to use; I wouldn’t have known what weights to use; I wouldn’t have known how to use them. And it’s just nice to have that person there . . . a great opportunity and I learnt about myself. I had never been to a gym. That’s why I thought I wouldn’t be any good.

Because they lacked direct knowledge of their own capabilities in regard to resistance training, learning how to use the equipment (via modeling from the student supervisor and other participants) increased their knowledge and self-efficacy, which made them feel good mentally and motivated them to continue training. All the participants, regardless of whether they trained alone, with a friend, or with their partner, intended to continue with the resistance training program independently after the initial intervention because of the perceived benefits and competency in using the equipment they had gained. Joe explained:

I think we’ve [he and his wife] . . . found it interesting, useful, and we want to continue it . . . because . . . we’ve always thought it was something we should be doing. We haven’t quite known how to go about it, we haven’t sought guidance, this [program] has given guidance of what to do, how to do it, and all the detail, and provided us with the facility. And we feel better when we’re doing it, generally, a general sort of well-being . . . and knowing that you’re doing it, doing something good for your health is always a great positive isn’t it? And feeling better . . . It has become something which we want to incorporate in our lives, and it’s made us much more conscious of the merits of exercising and the outcomes that one can get.

**“A Sense of Accomplishment.”** Another factor contributing to the participants’ feeling good mentally was a “sense of accomplishment.” In relation to the actual exercises, Keith, 68, believed that “you do have a sense of well-being in just achieving it . . . , which is basically just psychological.” Barbara also commented that it feels “very good” when the weights go up because, “Oh well, you’ve got stronger I suppose. It’s more mental than anything else, but a sense of accomplishment, you know? I couldn’t have done that when I started it and I can do it now.” Barbara was feeling this sense of increased strength and satisfaction after only 4 weeks of training. She added, “just the physical activity itself [makes it enjoyable], that brings that good feeling when I leave the gym.” Joe agreed, “I’m glad I’m doing it. I think you feel good afterwards . . . there is a good feeling after you’ve done it. I think emotionally and sort of physically . . . there is a general sense of warmth and well-being.” When asked how she felt immediately after she had completed a session, Donna exclaimed, “Oh, I feel great! I go home and I really feel good. I like it . . . Your body and your mind. You think, ‘Oh, I’ve done it. I achieved it!’ Which is good. . . .” These quotes emphasize the mind–body connection and show that it was extremely rewarding for the participants to experience strength gains and complete the exercises each session. This sense of achievement evidently contributed to enhanced self-efficacy, which consequently benefited their psychological well-being.

**“Taking Control.”** Furthermore, like many of the participants, Sophie viewed regular participation in resistance training as one way of “taking control” of her life, maintaining her independence, and preventing future “health problems”:

Well, I suppose the main thing is that I’ve been able to take control of my own health and change it. And do something to bring about positive change . . . not only can I do it, but it’s my responsibility . . . first to maintain optimum health . . . so that I can keep doing what I want to do . . . keep going. Keep on my feet. . . . It’s good insurance . . . it’s taking responsibility for my health and for my future well-being. . . . It also means that later on I may not need surgery or drugs. I want to be as drug free as possible; I want to die healthy! That’ll be my goal and this [resistance training] contributes to that.

Sophie believed first and foremost that it was her responsibility to maintain good health, and doing so gave her a sense of satisfaction and motivation:

The benefits are just so well worthwhile . . . to my general health . . . a more holistic effect. I’m feeling really good. And I feel good that I’m doing it . . . psychologically I feel, you know, “aren’t I good to be doing this.” So I feel . . . it’s not just the physical thing, it’s knowing that I’m doing something worthwhile for my future good health. Hmm which encourages me.

Keith agreed:

But it’s a definite advantage no doubt about that, in keeping yourself healthy . . . staying healthy is the best way to avoid problems . . . we [Keith and his wife] haven’t really got any health problems, but I think what we’re looking at is that if we can maintain our health we won’t have any problems down the track.

Taking responsibility for one's health can be an empowering experience. The majority of participants expressed pride in themselves for taking the steps to remain healthy and active in later life, which contributed to their "feeling good" mentally. These findings also demonstrate that the enhanced self-efficacy the participants experienced in relation to resistance training generalized to a feeling of confidence in maintaining optimum health.

### **"The Social Side"**

Another key factor associated with feelings of good health and well-being was social interaction. The participants enjoyed the opportunities for positive social interaction (including social support and social influences) with general gym users, the other participants of the intervention, and particularly their student assistant. This theme has two key dimensions: the "atmosphere" and "intergenerational" interaction.

**"The Atmosphere."** Enjoyable social interaction was a perceived (and an author-observed) benefit for the participants, both in and outside the "gym" context. The author found the gym atmosphere to be friendly, supportive, and vibrant. Participants were seen and heard talking to each other between exercises, laughing at themselves and with one another, discussing their "favorite" and most "hated" exercise machines, comparing what weight they lifted to others in the program or gym, assisting each other with setting up the machines, and smiling or waving across the room. Donna explained that "we all sort of got to know each other a bit, but some of them I never saw at all until we—'cause the times were so different. But a lot of them we sort of got to talk to each other. And we'd help each other out." Joe provided a typical description of the gym atmosphere from the participants' perspective:

The experience at the gym, 'cause it's a new experience for us, you know, with the business of the gym and people looking very fit and doing all sorts of strenuous things. It's an interesting place to be . . . I thought it was great! Really positive. . . . It was heartening to see a lot of young people. . . . A really positive sort of atmosphere to be in. And meeting the other oldies . . . there's some joy, meeting the same sort of group of people in the gym, meeting Warwick [his student assistant].

Donna agreed:

I'm enjoying it . . . I think it makes you feel as though you're part of the world. And . . . it's nice to come up onto the university campus and see all these students doing all "studenty" things and it's good. You get out of the house.

In particular, all of the participants commented that they felt welcomed and "comfortable" in the university gym environment. They found, overall, the other gym users (i.e., students, staff, and the like) to be "friendly," "helpful," "accommodating," "obliging," "pleasant," and "considerate," and they "don't interfere" or "weren't patronizing." For example, Caroline was "most impressed" that "the students not involved [in the research] will get off machines for you," and Donna said, "all the people, not only the students that you had . . . were all very considerate and very

nice to us. I think maybe they thought it was fun, but they all smile at us and, any of them, if you asked them, would do anything they could to help.” The friendliness and openness of the gym environment also offered vicarious experiences whereby participants could see other participants lift certain weights successfully. In this sense, participants (unintentionally) acted as role models for one another. For example, several participants commented that when they saw another participant, particularly an older participant, or for men, a female participant, lifting a certain weight, it inspired them to try it. While the author was in the gym, she overheard a male participant say, “If she [another study participant] can lift that much on the leg press, so can I!” Then, he proceeded to attempt the same weight on the leg press and was successful.

The program also provided opportunities for the participants to socially engage with each other and the researchers, outside the gym context. For example, an information session was held and participants were encouraged to ask questions and discuss how they were finding the program so far. Before the session began, participants sat outside and spoke to each other about their experiences and wrote down common questions that were then discussed with the researchers in the meeting. Also, a recognition luncheon and, at the end of the program, a presentation evening were held with the students. At the presentation, coffee, tea, and biscuits were available before the formal procedures began and the author observed the participants talking and laughing with one another and the students. In their interviews, all the participants provided positive comments about these meetings, such as “the openness has been . . . excellent” and “very useful, very helpful.” For example, Barbara explained,

Very friendly atmosphere, at any of those occasions when we met, yes. . . . And listening . . . there were lots of good questions . . . and good discussion around diet and exercise and things like that. But it was useful. . . . And there would be a few more people in town I’ll smile at and speak to now ‘cause I met them in the gym.

**“Intergenerational” Interaction.** In addition, the majority of participants developed a uniquely positive relationship with their student supervisor. They believed that “intergenerational” contact or “the social side” with the student was a major benefit of the program. Caroline said,

There’s quite a good rapport between the students and the older person. And older people need young people around them. Because old people are boring and old . . . they’re set in their ways, they’re dull . . . this is a generalization of course, they’re negative, they put confines on themselves, and young people get them away from that. . . . I personally thought the joking bit [among the students and participants at the presentation evening] was the best bit ‘cause that proves the relationship is there. . . . See, I just think that is excellent.

All participants said that they appreciated the time and effort that the students put into the program and often praised them during interviews. For instance, Barbara said,

On the whole I just think that the students are really very good . . . they seem to really be earnest about what they are doing. They’re obviously

learning. . . . They're friendly and respectful . . . they don't fool around or anything . . . you couldn't do it if you didn't have someone with you to encourage you and just be there.

The preceding quotation emphasizes the importance the participants placed on the ongoing verbal encouragement and support given by the students, because without that Barbara believes she would not have the ability and motivation to do the exercises. The author observed and heard the students motivating their participant via proximity and verbal persuasion. For instance, a student crouched down beside his participant (who was pumping her legs up and down on the leg press with intense effort) and exclaimed, "Come on, you're doing great, just three more reps. You can do it!"

Not only did the students offer the participants encouragement, instruction, feedback, and leadership, but, perhaps more importantly, friendship. For instance, various participants used such words as "delightful," "fabulous," "excellent," "so nice," or "enthusiastic" to describe their particular student, and many said that they felt "very lucky" to have the student they were paired up with for the program. Throughout their interviews, many participants told stories about the unique relationship they had developed with their student, such as by describing how knowledgeable, helpful, reassuring, and motivating their student was with the program; learning about the students' interests, family, aspirations, and career plans; joking around with their student; having their student over for dinner; visiting a student's dormitory and meeting their friends; going out for lunch with their student, and/or; giving them a thank-you gift at the end of the program. These findings demonstrated the strength of the rapport and showed that it went beyond the context of the exercise program. Sophie provided a statement that typified the type and value of friendships formed: "The other thing too that I enjoyed was the contact with the young people. . . . Get to know what they do and what they think and yeah. That was good contact. Intergenerational meeting . . . I thought that was one of the pluses." Evidently, intergenerational interaction was a welcomed side benefit of the intervention program that clearly contributed to the participants' psychological well-being.

## Discussion

The above discussion of themes revealed that self-efficacy and social interaction were the key mechanisms underlying the link between resistance training and psychological well-being for this group of older people. This is one of the first known studies to explore factors underlying the well-being and exercise relationship for older people from a qualitative perspective. Self-efficacy theory provided an effective framework for explaining the findings. It was shown that the participants drew on Bandura's four sources of self-efficacy in the following ways.

1. Performance attainments: The participants experienced gains in competency and a sense of satisfaction and accomplishment when they successfully performed the exercises, when the weights or number of repetitions increased, and when they could better perform other recreational pursuits or activities of daily living. The participants said that they felt "good" both physically and mentally as a result of their exercise achievements and experiences. These

findings provide support for the role played by performance attainment and affective responses in the generation of self-efficacy within the context of the exercise environment (Bandura, 1986; McAuley et al., 2003). According to McAuley et al. (p. 1), performance attainment “is likely to act as the most powerful source of efficacy relative to continued participation.” They also argued that “the extent to which feeling good and enjoying the physical activity experience plays a direct role in the maintenance of exercise over time is an intriguing, but little studied relationship” (p. 6).

2. Vicarious experiences: The participants relied heavily on modeling from the student trainer because resistance training was unfamiliar to them. As argued by Bandura (1986, pp. 399-400), “Perceived self-efficacy can be readily changed by relevant modeling influences when people have had little prior experience on which to base evaluations of their personal competence.” The student supervisors provided demonstration, which reduced participants’ anxieties and increased their confidence in how to do the exercises correctly and safely. This finding emphasizes the key role that health and fitness professionals play in assisting older people to begin and continue an exercise program (as discussed in the Conclusion and Recommendations section, herein). Other participants acted as role models, which helped the observer of these role models to believe in their own ability to master the task. Also, the increase in weights lifted or number of repetitions conducted provided objective vicarious information on participants’ improved strength. According to Bandura (1986, p. 400), “Activities that produce clear external information about the level of performance provide a factual basis for judging one’s capabilities.” Therefore, the criteria by which ability was evaluated (i.e., increased weights or number of repetitions) played a key role in the effect of vicarious information on self-efficacy appraisal for these older people.
3. Verbal persuasion: The student supervisors provided the participants with encouragement and feedback, and the participants themselves offered each other verbal support, which helped to increase feelings of self-efficacy.
4. Physiological state: The participants perceived bodily sensations associated with exercise, such as arousal and tiredness, as positive signs of increased strength and health, which has the potential to increase self-efficacy appraisals in relation to exercise.

In addition, the finding that perceived physical changes associated with resistance training enhanced the participants’ confidence and competency when participating in other activities relates to Bandura’s notion of the generality of perceived self-efficacy. Bandura (1986, p. 399) argued that, “Once established, enhanced self-efficacy tends to generalize to other situations, especially those in which performance has been self-debilitated by preoccupation with personal inadequacies,” which seems to be the case with older people in regard to their perceived functional ability. Bandura also argued that generalization usually occurs in activities that are most like the ones in which self-efficacy was increased. Consistently, it was shown in the physical changes theme that the enhanced self-efficacy that the participants experienced in relation to exercise and functional ability was generalized to other types of exercise, such as golf, walking, and riding a bike, and to other daily activities that required sufficient functional ability, such as getting



out of a bath and gardening. It was also shown in the "taking control" subtheme of a "good feeling" that the enhanced self-efficacy the participants experienced in relation to resistance training generalized to a feeling of confidence in taking steps toward maintaining optimum health. According to Whaley and Schrider (2005), beliefs about self-competency play a principal role in motivated behavior among older people. They argue that an older person may be motivated to maintain or increase resistance training if the connection is made between strength gains and their ability to remain independent. Clearly, the participants in this study had made that connection.

The above findings add support to research that has found that self-efficacy is a key factor in predicting exercise behavior and that self-efficacy is positively affected by exercise for older people (Netz et al., 2005; McAuley & Katula, 1998; McAuley & Rudolf, 1995). In addition, social interaction was found to be another source of self-efficacy, specifically, and it contributed to psychological well-being, generally, for the participants.

In regard to self-efficacy appraisals, social interaction with other participants and their student supervisor provided participants with enjoyment (i.e., positive affect), verbal persuasion, vicarious experiences, and informational and emotional support. For instance, the type of social support described in the "atmosphere" subtheme of "the social side" was informational in that it involved participants sharing information about exercise and health, and emotional in that they showed empathy toward each other and assisted each other (Resnick et al., 2002). The social support provided by the students involved verbal encouragement and appraisal, vicarious experiences, and "friend" support (Resnick et al., 2002). These findings contribute to Bandura's (1986) notion of the construction of self-efficacy beliefs as the mediator between social support and the subsequent health behavior. These findings also support quantitative research by Resnick et al. (2002), McAuley et al. (2003), and Deforche and De Bourdeaudhuij (2000), who found that social support and social influences played a key role in the production of self-efficacy expectations. In regard to contributing to participants' overall psychological well-being, social interaction provided pleasure, friendship, intergenerational interaction, and pride.

This qualitative study has extended previous research by exposing insights into psychological health benefits that are often underreported or have not appeared statistically significant in quantitative studies with healthy older people. For example, in contrast to McLafferty et al. (2004), who did not find a statistically significant increase in older people's vigor as a result of resistance training, the participants in the current study spoke about feeling "invigorated," "alive," and stimulated after exercising. They also expressed meaningful improvements in their psychological well-being and subjective health, which differs from Perrig-Chiello et al.'s (1998) statistically insignificant changes in these variables.

The results also added richness to the substantial scientific evidence that supports a positive association between resistance training and improved strength, endurance, and functional ability (e.g., Brandon et al., 2004; Cavani et al., 2002; Hunter et al., 1995; Phillips et al., 2003). Overall, the participants viewed resistance training as helping them to maintain a healthy, independent, and socially engaged life for as long as possible and to prevent or delay age-related disabilities or diseases. These findings qualitatively support the argument of Hurley and Roth (2000), Tseng

et al. (1995), and Winett and Carpinelli (2001) that resistance training results in improved strength or prevented muscle wastage, and a lessened chance of falling or developing disabilities or age-related diseases.

Furthermore, the findings provide qualitative evidence that supports research by Netz et al. (2005) and McAuley and Rudolf (1995) who found that moderate-intensity exercise and programs longer than 10 weeks, respectively, contribute to psychological well-being for older adults. In particular, the current study supports the general finding that fostering social interaction and increasing self-efficacy may be the most effective strategies in motivating older adults to be physically active (O'Brien Cousins, 1998; Van Norman, 1998). Further research could involve a follow-up study with the participants to determine factors facilitating adherence and compliance to resistance training and/or barriers leading to dropout.

## Conclusion and Recommendations

Given the aging of Australia's (and the developed world's) population, providing opportunities for older people to engage in meaningful physical activity has become one way of assisting them to remain healthy, productive, and independent, thus reducing overall health costs (Kolt et al., 2004; McCormack, 2000). The findings from this study have potential practical applications that can assist in the successful design of resistance training interventions.

Despite the promotion of physical activity to older people, many of them have never had the opportunity to try resistance training, are unaware of how it can benefit their life, and/or are unsure of how to use the exercise machines. Fitness leaders cannot expect older people to walk into a gym and know what to do. To reduce the anxieties or uncertainties that older people may have about resistance training, it is important to educate them on the correct training techniques and use of the machines, as well as which muscles each exercise targets and the potential physical and mental benefits of training. In the current study, this information was initially given to all the participants during the introduction meeting, and then it was individually reinforced by each assigned student supervisor throughout the intervention. Therefore, to assist older people in this learning process, it is recommended that fitness leaders or exercise intervention organizers provide initial and ongoing one-on-one demonstration, guidance, feedback, and encouragement for older people who endeavor to begin a resistance training program. This strategy has the potential to instill self-efficacy in older people, and it is more likely they will continue with the program on a long-term basis. Allowing for performance accomplishments (such as the weights and number of repetitions increasing throughout the program) and providing ongoing feedback on improvements (e.g., through the use of an exercise log book) are other ways to increase exercise efficacy. In particular, having young people act as trainers proved successful in this study because not only did they fulfill their required roles (as outlined in Methods under the Exercise Intervention heading), but they also treated the participants with respect, got to know their assigned participant, and spent time with them outside the gym context (as described). Thus, it is recommended that considerate, knowledgeable, and motivated young people be involved in the delivery of resistance training interventions for older people to maximize the pleasure of intergenerational interaction and sources of vicarious experiences and verbal encouragement.

Furthermore, providing opportunities for social interaction is central to maintaining participant interest and enjoyment in resistance training. Ways to meet this aim include ensuring a positive, safe, and accommodating training environment. The findings from this study demonstrated that if older people feel welcomed, comfortable, and not patronized, they will enjoy the gym atmosphere and are more likely to undertake or maintain resistance training. Likewise, Stathi et al. (2002) and Van Norman (1998) argued that it is important to make older people feel a sense of belonging in the gym environment, especially in regard to exercise adherence. Also, it is recommended that future exercise intervention programs for older people include information sessions and social engagements (such as the recognition luncheon and presentation evening discussed in this study) to facilitate the participants getting to know each other outside the training context. In fitness centers or gyms, managers could provide space and organize times for older participants to socialize after they train. These activities may increase the likelihood that single participants (i.e., widowed or unmarried) will find a "training buddy" who can assist in supporting and motivating them to continue training. Also, allowing for older participants to exercise at the same time will increase modeling, emotional and informational support, and enjoyment, consequently increasing self-efficacy.

Ultimately, providing opportunities for older people to try resistance training and having it become a regular part of their lifestyle are ongoing challenges. Adopting the strategies described herein and considering the complex, interrelated, and dynamic nature of older people's perceived benefits of resistance training and their underlying mechanisms have the potential to address these challenges.

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## Appendices

### Appendix A Participant Characteristics

| Name     | Age | Gender | Previous involvement in resistance training                            | Other current activities                                       | Living arrangements                                |
|----------|-----|--------|--|--|--|
| Sophie   | 65  | Female | Tried resistance training, but received no supervision so stopped      | Gardening, walking, volunteer work                             | Lives in own home with aged mother                 |
| Caroline | 65  | Female | Never been to a gym or tried resistance training                       | Gardening, U3A, walking dogs                                   | Divorced, lives alone in own home                  |
| Betty    | 65  | Female | Never been to a gym or tried resistance training                       | Golf, lifeball, volunteer work, walking                        | Married to Keith, live together on a property/farm |
| Keith    | 68  | Male   | Never been to a gym or tried resistance training                       | Farming, walking   | Married to Betty                                   |
| Grant    | 67  | Male   | Never been to a gym or tried resistance training                       | Walking, cycling, restoring engines                            | Lives with wife on property                        |
| Joe      | 68  | Male   | Has an exercise bench with weights at home, but hasn't used it much    | Field hockey, exercise bike, walking, various community groups | Lives with wife in own home                        |
| Barbara  | 69  | Female | Never been to a gym or tried resistance training                       | Full-time work as a nun  | Lives at convent                                   |
| Donna    | 71  | Female | Has utilized a fitness gym before, but never tried resistance training | Golf, U3A  | Widowed, lives in own home                         |
| Jan      | 69  | Female | Never tried resistance training  | Walking, exercises at home, church group                       | Married to Jake, live together in own home         |
| Jake     | 72  | Male   | Did resistance training when younger, but has not done it since        | Walking, exercises at home, yard work, volunteer work          | Married to Jan                                     |

*Note.* U3A = University of the Third Age.

## Appendix B In-Depth Interview Guide: Preintervention, During the Intervention, and Postintervention

| Topic                                    | Sample questions   |
|--|--|
| <b>Preintervention interview</b>         |  |
| Exercise history                         | Can you tell me about your past experiences in exercise? Have you ever been involved in resistance training? What knowledge do you have of resistance training?  |
| Expectations and initial opinions        | What are you expecting to gain physically and mentally from resistance training? What are your general opinions about older people and resistance training?  |
| Apprehensions                            | What concerns or anxieties (if any) do you have about resistance training?   |
| Self-perceptions                         | How would you best describe yourself? How do you perceive your physical and psychological health? What does quality of life mean to you, and how do you perceive your quality of life? What feelings do you associate with your body?                  |
| <b>Interview during the intervention</b> |  |
| Current experiences                      | Describe your experience so far with the exercise program. How does it feel when exercising; how does it feel immediately before or after the session?   |
| Student assistant                        | Describe your relationship with the student volunteer who supervises your exercise session.  |
| Perceived changes                        | Have you experienced any positive and/or negative changes in your physical or mental health associated with the program? How do these changes relate to your quality of life and general activities of daily living?                                   |
| Apprehensions                            | Have any apprehensions you may have had subsided? What have you learnt so far about resistance training? Have any different concerns emerged?  |
| Self-perceptions                         | How would you best describe yourself? How do you perceive your physical and psychological health? How do you perceive your quality of life? What feelings do you associate with your body? [These answers can be compared with the above for changes.] |
| <b>Postintervention interview</b>        |  |
| Outcomes                                 | What did you gain from this experience, psychologically? How do these relate to your physical benefits? How do the outcomes relate to your quality of life and activities of daily living?   |
| Meeting needs                            | Were your needs and expectations of the program met? How do you think resistance training can affect older people in general? Would you recommend this type of exercise intervention to other older people? Why or why not?                            |

*(continued)*

**Appendix B (continued)**

| <b>Topic</b>      | <b>Sample questions</b>  |
|-------------------|--|
| Apprehensions     | Were any apprehensions you may have had resolved? What have you learnt about resistance training?  |
| Self-perceptions  | How would you best describe yourself? How do you perceive your physical and psychological health? How do you perceive your quality of life? What feelings do you associate with your body? [These answers can be compared with the above for changes.] |
| Student assistant | Describe your relationship with the student volunteer who supervised your exercise session. [Compare response to above.]   |
| Plans             | Do you anticipate continuing resistance training? On your own, or with the student volunteer?  |
| Other             | Is there anything else you would like me to know about your experiences in resistance training?  |



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