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The influence of physical activity on quality of life

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Abstract
In recent years there has been increased focus on the importance of quality living. In fact, an informal search of Medline (Pubmed) data base using the search terms "quality-of-life" (QOL) resulted in 65,522 hits involving all publications focused on human beings while an identical search on the Psychinfo data base resulted in 13,506 publications. This research attention is justified because quality-of-life is an important predictor of diverse outcomes including physical and mental health, happiness at work and satisfaction in interpersonal relationships. The limited evidence from clinical trials about the effect of different PA intensity on QoL dimensions is not conclusive, and the majority is originated from high-income countries.

Keywords: Activity, Disability, Quality of life

1. Introduction

There are an ever-increasing number of adults in the United States who have some form of disability. According to the United States Bureau of the Census the number of people who report disabling conditions is approximately 54 million while approximately 26 million report conditions that significantly impact one or more activities of daily living (McNeil, 1997) [23]. In addition, there are roughly 11,000 reported spinal cord related injuries each year (Spinal Cord Injury Information Network, 2003) [24]. With such large numbers of individuals who report disabling conditions it becomes important to precisely characterize what it means to be physically disabled.

Disability

The term disability can have several meanings. According to Mosby's Medical, Nursing, and Allied Health Dictionary (5th ed.), disability is the loss, absence, or impairment of physical or mental fitness. Impairment is defined as any negative change in function or structure that interfere with ordinary activities as a result of bodily or mental abnormalities. (Mosby's Dictionary, 1998) [25]. It may also be defined as when the physical capacity to move, coordinate movement, and perform physical activities is significantly impacted. According to the World Health Organization, the terms impairment, disability, and handicap are distinctly different (Block, Griebenauw, & Brodeur, 2004) [5].

Activity

Recently the term activity has replaced disability. Activity refers to the type and level of functioning displayed at the individual level. For instance it could refer to a person's ability to take care of him or herself, walking, or communicating (Hays *et al*., 2002) [7]. Also, the term handicap has been replaced by participation. Participation describes the level and degree of a person's involvement in life situations. An individual's level of participation can be affected by personal or environmental factors (Block, Griebenauw, & Brodeur, 2004) [5].

Quality-of-life (QOL)

In recent years there has been increased focus on the importance of quality living (Hays, Hahn, & Marshall, 2002; Ware, 2000) [7, 20]. In fact, an informal search of Medline (Pubmed) data base using the search terms "quality-of-life" (QOL) resulted in 65,522 hits involving all publications focused on human beings while an identical search on the Psychinfo data base resulted in 13,506 publications. This research attention is justified because quality-of-life is an important predictor of diverse outcomes including physical and mental health, happiness at work and satisfaction in interpersonal relationships (Deiner, 2000) [26]. In able-bodied samples, subjective well-being, a psychological construct related to subjective QOL, has been shown to be correlated to various specific domains in a person's life (Rejeski & Mihalko, 2001) [15]. Variables such as age, education level, social class, income, marital status, employment, religion, leisure, life events, social skills, and health all can affect happiness, although most effects are small (Argyle, 1999) [1]. The strongest effects are seen from marriage, occupational status, leisure, health, and social skills. Others have suggested that since humans have an instinctual urge to belong, developing and maintaining close relationships with others plays a role in happiness (Myers, 1999) [11]. Additionally, it has been posited that when people report well-being, they will often compare themselves to others. The level of reported well- being may depend on whether comparisons were made to others who are better or worse off than the individual (Schwarz & Strack, 1999) [16].

Measuring Quality of Life

As discussed above quality of life researchers have produced many conceptual definitions and measurement instruments to assess this construct: Berger and Motl (2001) [4] estimated that over 300 scales have been produced that measures quality of life. Because of the plethora of quality of life scales and due to the fact that my thesis will adopt a subjective approach to assessing this construct I will only review the psychometric characteristics of two widely used instruments: the SF-36 (Ware, Kosinski, & Dewey, 2000) [20] and the Satisfaction with Life Scale (Diener, Emmons, Larson, & Griffin, 1985)

[27]. The Satisfaction with Life Scale is a five-item survey that includes statements such as, "In most ways my life is close to ideal," and "If I could live my life over, I would change almost nothing," (Diener, Emmons, Larson, & Griffin, 1985) [27]. Respondents give answers based on a 7- point Likert Scale, so scores can range from 5 to 35. The SWLS was shown to have adequate internal consistency (α = .87) and a two-month test-retest reliability (α = .82), and it hasconvergent and divergent validity between a number of personality scales and other subjective well-being scales (Diener *et al*., 1985) [27]. The SWLS is a uni-dimensional measure and has been validated for a wide range of age groups (Pavot, Diener, Colvin, & Sandvik, 1991) [13]. Other QOL measures contain sub domains that measure work, self, primary social contacts, acceptance by others, recognition, and prestige (Landers & Arent, 2001) [28]. Pavot and Diener (1993) [12] also demonstrated that self-reports correlated highly with reports made by peer, family members, and friends. The SF-36 measures health related QOL by taking both mental and physical health and breaking each down into four scales for a total of eight scales ranging from 2 items to 10 items (Ware, Kosinski, & Dewey, 2000) [20]. The score for physical health is broken down into scales for physical function, role-physical (e.g. work activity or activities of daily living), bodily pain, and general health (Ware, Kosinski, and Keller, 1994) [22]. Likewise, mental health is measured onscales of vitality, social functioning, role-emotional (e.g. how emotions affect work or ADL), and mental health. These items are scored on a Likert scale, which range from 1-3, 1-5, or 1-6 depending on the specific item (Ware *et al*., 2000) [20]. The SF-36 has been shown to be valid and reliable measurement of HRQOL for the general population as principal component analysis confirmed the two-factor higher-order structure for this instrument across a range of samples (Ware *et al*., 2000) [20]. Because the SF-36 was designed and validated with able-bodied individuals it is generally not recommended for use with individuals with disabilities (Hayes, Hahn, & Marshall, 2002) [7]. However, recent recommendations in the literature have demonstrated how specific items on the SF-36 can be modified to be more pertinent for this group (Tate, Kalpakjian, Forchheimer, 2002) [19]. The quality of well-being scale (QWB; Kaplan & Anderson, 1988) [29] places individuals into categories based on their level of functioning and their symptoms. Functioning is measured on scales of mobility, physical activity, and social activity. Interviewers ask patients questions concerning their level of limitation for the previously mentioned scales in order to classify their objective level of functioning. Then patients are given a list of symptoms they might experience. The interviewer then asks the patient to choose the symptom they are experiencing that is most undesirable to them (Kaplan, 1994) [30]. To generate a score for wellness the weighted score for symptom is summed with the weighted scores for mobility, physical activity, and social activity along with 1. Possible scores range from 0 to 1, with zero indicating worst possible well-being (death) and a score of one meaning the individual is completely well. For example, a weight of 0 is given for no limitations across the three scales and for no symptoms. A person who has no limitations and no symptoms would score a one. The weights assigned to states of functioning were obtained through cross-validation studies that demonstrated a high degree of accuracy (R2 = 0.96). Studies have also shown that these weights are stable over a one-year period and that they are consistent across an assorted groups of users (Kaplan, Bush, and Berry, 1978) [31]. Additionally studies have shown that the QWB scale is both valid and reliable in the general population (Kaplan, Bush, Berry, 1976) [32]. As with the SF-36, the QWB scale is considered "problematic" for individuals with disabilities due to its quantification of functioning (Hays *et al*., 2002, p. S7) [7].

Relationship between physical activity (PA) and quality of life (QoL)

The limited evidence from clinical trials about the effect of different PA intensity on QoL dimensions is not conclusive, and the majority is originated from high-income countries (Fox *et al*., (2007) [6]; Holton (2003) [8] reported positive effects of a 12-month program of moderate PA on physical, psychological and environmental domains among senior women; yet, there was no similar effect in the social relations domain. Holton *et al*. (2003) [8] did not observe effects on QoL domains on men and women, after 10 weeks of a moderate PA program, when compared to the control group. Evidence from clinical trials is lesser among adults. However, cross-sectional studies show that the relationship between PA and QoL domains does not seem to be linear. For example, among Japanese adults reaching PA recommendations, the QoL scores are higher for the physical, vitality and general health domains, when compared to the inactive ones. Nonetheless, low levels of PA were also associated with higher QoL scores, although only for the physical domain (shibuta, 2007) [17]. At the present time, considering specific domains, evidence about the complex relationship between PA and QoL is not available in low- and middle-income countries. In high-income countries, most PA is conducted in leisure time; on the other hand, in low- and middle-income settings, transportation and occupational PA represent a large amount of total PA. Because the intensity, duration and frequency of PA practiced in these domains are different, it is possible that the associations observed in high-income countries will differ from the ones observed in low- and middle-income settings. In addition, the region in which this study took place (Brazil) is experiencing rapid urbanization, demographic, nutritional and epidemiological transitions (Mathers *et al*., 2009) [34], all of which can impact on both PA and QoL.

Material and methods

This article is review and the aims are the influence of physical activity on quality of life of older adults. The experiment 1 was conducted by Stancil (2007) [18]. In the previous section, I discussed the higher-order themes that emerged from the data and provided quotes from the interview text to provide context to my observations and conclusions. In this section I will propose a grounded theory of the role physical activity plays in the quality for life for individuals with physical disabilities and why the participants in this sample maintained involvement in physical activity behaviors. This portion of the analysis represents a second more deductive analysis typically conducted by grounded theorists and involves making links between previous theory and research and the findings observed here (e.g., sensitizing concepts). Another purpose of this section is to elaborate

more specifically about how the major higher-order themes are related to one another and other outcomes such as quality of life. In other words, it is important here to explicate theoretically whether the higher-order themes are related to one another and other variables in a causal, correlational, or bi-directional manner. For the purposes of this discussion it appears warranted to introduce Bandura's (1986, 1997) notionof triadic reciprocal causation adapted graphically in Figure 1. The focus of this thesis included determining activity levels of the participants. The PASIPD broke down activity level into several different categories. These categories were physical activity, household activity, lawn and garden activity, caring for another person, and work activity. Physical activity was broken down further into the subscales reported by Washburn *et al*. (2002) [35] that included a total score, home repair/gardening, housework, vigorous sport, light/moderate sport, and occupational activities. This latter category includes general wheeling not intended for exercise. The participants' total scores on this measure ranged from 6.20 and 71.22 for both males and females while the average for the entire sample was 36.34 (SD = 15.28). The PAD model suggested previously that an individual's gender played a role in their participation in physical activity. An independent samples t-test was then performed in order tocompare differences between males and females on the total PASIPD score. The results of this test proved non-significant t(24) = .48, p = .64.. The subscale scores representing vigorous sport and light/moderate sport were well above the averages reported by Washburn *et al*. (2002) [35] in their validation study and ranged from 2 to 42.57 and 0 and 23.15, respectively. In contrast, the participants in this sample reported less activity with regard to occupation as the means here were ~ one standard deviation below those reported by Washburn *et al*. (2002) [35]. In short, the participants in the current study were relatively active as they reported participation in moderate and vigorous sport activities and had higher total scores than Washburn *et al*. (2002) [35] as shown in Table 1.

Table 1: Means and standard deviations for the PASIPD (Stancil, 2007) [18].

Subcategory	Sample Mean	SD
Home Repair/Gardening	.16	.55
Housework	2.49	2.68
Vigorous Sport	18.62	13.68
Moderate Sport	5.33	5.53
Work not for Exercise	9.73	7.92
Total	36.34	15.28

The participants included 12 male and 14 female adults between the ages of 18 to 54 (M = 31.12, SD = 10.75) who all reported one or more condition(s) that impacted their daily living (e.g., spina bifida, cerebral palsy, T-11/12 paraplegia, bi-lateral amputee, etc.). The sample consisted of 20 Caucasians, 1 Asian American, 4 African-Americans, and one individual reported being mixed racial and ethnic background. The participants reported a variety of health conditions including specified and unspecified paraplegia (N = 14), bi-lateral or single amputee (N = 3), cerebral palsy (N = 2), quadriplegia (N = 1), spina bifida (N= 1), chronic pain (N= 1), complete fusion of the spine (N = 1), and 3 individuals did not specify why they used a wheelchair (Stancil, 2007) [18]. Twenty-five of the twenty-six participants were either active in wheelchair basketball at the time of the interview or had been previously. Twenty-two individuals from the sample gave a specific time period for their participation. The average time playing wheelchair basketball by those who reported specific times was 9.03 years and ranged from 26 years to 3 months. Some participants reported participation in other activities such as swimming, road racing, wheelchair tennis, darts, and pool. The median age of the sample was 29 and consisted of 10 individuals between 18 and 24, 6 were 25 to 34, 6 aged 35 and 44, and 4 individuals who were 45-54. The breakdown of the age variable was done according Center for Disease Control guidelines (Stancil, 2007) [18]. The Physical Activity Scale for Individuals with Physical Disabilities (PASIPD). The PASIPD is a 13-item scale developed and validated to measure physical activity, health, and 49 function for individuals with physical disabilities Washburn *et al*. (2002) [35]

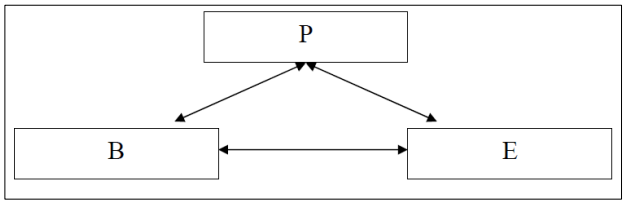

Fig 1: Triadic reciprocal causation adapted from Bandura (1997) representing the three major determinants of behavior. B represents behavior; P the internal cognitive, affective, and biological events; and E the external environment (Stancil, 2007) [18].

This instrument consisted of five subscales: home repair/lawn and garden work, housework, vigorous sport and recreation, moderate sport and recreation, and occupational activities (Stancil, 2007) [18]. The PASIPD requested respondents to indicate how often during the past seven days they participated in various activities at home and outside the home as never, seldom (1-2 days/week), sometimes (3-4 days/week), or often (5-7 days/week) and on average how many hours a day they participated (<1hour, 1 but <2 hours, 2-4 hours, >4 hours. With regard to the occupational item 13, the response categories include <1 hour, 1 but < 4 hours, 5 but < 8 hours, > 8 hours (Stancil, 2007) [18]. Scores for the PASIPD are computed by multiplying the average hours per day by an estimated MET value based upon the intensity of the activity; this scoring procedure results in a mathematically maximum score of 199.5 and estimated MET values for each of the five factors and a total score. Washburn *et al*. (2002) [35] demonstrated preliminary evidence of the construct validity of the PASIPD and the five latent factors using factor analytic and correlational analyses. Their data also resulted in total PASIPD scores of 24.6 + 14.6 for individuals aged 51 and younger and 16.5 + 13.4 for those older than 51. The mean total score for males on this measure was 20.5 + 15.1 while the average for females was 19.9 + 13.5. Finally, individuals who selfreported no activity at all had a mean of 13.2 + 12.1, those who reported moderate activity had a mean of 19.8 + 12.7, and individuals who self-reported extreme activity had a mean score of 30.7 + 14.0 (Stancil, 2007) [18]. These means will allow me to group participants for this thesis by their level of activity. With regard to males and female participation in vigorous sport and physical activity

the two groups were virtually the same scoring an average MET hours/day of 2.9 + 6.6 and 2.7 + 6.7 for males and females respectively *Interview Guide.* An interview guide was developed for the purposes of this study (See Appendix A). Although an interview guide was used during all interviews, a semi-structured approach was used as the flow of conversation dictated the questions asked to the participants. The interview questions focused on the following: (a) the nature and etiology of the participants' disabilities, (b) occupational or school related questions, (c) perceived benefits of physical activity, (d) motives that sustain involvement in physical activities. Probes were used throughout the interviews to encourage the participants to expand upon specific ideas, experiences, and incidents that highlighted their physical activity experiences. The author and another graduate student conducted all interviews, which lasted between 30 to 90 minutes. *Procedure.* A purposive sampling procedure was used in an effort to recruit physically active individuals with physical disabilities. The participants were recruited with help from a member of the research team who facilitated a wheelchair basketball tournament at the Lakeshore foundation in Birmingham Alabama (Dr. Brent Hardin in the Department of Kinesiology) (Stancil, 2007) [18]. During this tournament individuals familiar with this member of the research team were approached and asked to participate in this study. I conducted 14 of the interviews while a graduate student advisee of Dr. Hardin interviewed the remaining 12 participants. Institutional approval was obtained from the University of Florida Institutional Review Board (IRB) prior to data collection (Stancil, 2007) [18]. The experiment 2 was conducted by (Pernambuco *et al*., 2014) [14]. The sample consisted of 159 physically independent and apparently healthy individuals of either sex, with mean age of 66.61 ± 4.73 years, body mass index was calcu- lated from weight and height measurements was 27.23 ± 3.46. All participants were retired, only ten were male and five participants return to work (Pernambuco *et al*., 2014) [14]. The times on schooling were mean eleven years. There was only one subject who didn't knew read or write. Priority was given to group that participated in physic- cal activity programs. The subjects were randomly dis- tributed by simple raffle into two groups. The group that participated in physical activity programs had 125 subjects, practicing resistive training for 16 weeks. These groups were denominated active group. The second group who called control group (CG with 34 subjects). The criterion were, the participants had to be 60 years of age or greater and be capable of performing physical activity. Those with osteoarticular alterations, cardiopa-thy, vascular diseases, diabetes, arterial hypertension all this diseases without medical control and any alteration that prevented practice of physical exercises were as-signed to control group. For the physical evaluation, the participants were asked to wear bathing suits (swimsuit and trunks) to obtain body measurements such as height and body mass index (BMI). To evaluate body mass, a certified (precision of 100 g) Fi- lizola scale was used. Height was measured using an IN- METRO certified stadiometer (precision of 1 mm) (Pernambuco *et al*., 2014) [14]. The groups responded to WHOQOL-100 question-naires were for the most part self-administered; however the researchers assisted some individuals with low visual acuity or low levels of scholarity. For statistical procedures were used Predictive Analy- tics Software (PASW) Statistics 18 for Windows and mean, standard deviation. To verify sample normality and ho- mogeneity were used Shapir-Wilk and Levene test. The ANOVA with repeated measures on group factors (ST, DFL and CG) and time (pre e pos-test) to compare inner and inter groups, followed by post hoc of Tukey to iden- tify differences. The study assumed level $p < 0.05$ for sta- tistical significance (Pernambuco *et al*., 2014) [14].

Results and Discussion

The experiment 1 was conducted by Stancil (2007) [18]. The results of the coding process described above are shown in appendix B. As shown, 5 higher-order themes (psychological benefits, physical health, social influences, social opportunities, and increased overall quality of life) were defined by 16 more specific first-order themes (Stancil, 2007) [18]. The psychological benefits higher-order theme was defined by the first-order themes of cognitive benefits (N = 10), emotional benefits (N = 15), behavioral benefits (N = 8), and self-perception (N = 15). Ten participants mentioned that they benefited cognitively from participation in physical activity. One participant, a 21 year-old male who scored a 47.97 on the PASIPD, said, I've actually developed a pretty good mental strength through basketball. You really have to stay focused and concentrate and like doing it back to back has not only helped me physically but mentally to get through a whole 40 minutes of basketball. In addition a 43 year old female who scored a 30.75 on the PASIPD stated, "I don't know I guess more specific to basketball I guess than in general, but the ability to get better at something and learn new skills (Stancil, 2007) [18]. I thought, I wasn't sure that was possible, you know." Still another participant received cognitive benefits from physical activity saying, "…I've learned a lot of like really life lessons, you know from like winning and losing and…I've just learned a lot about sports but also about how to communicate with others." For these three participants, physical activity provided them a means to learn new skills and become mentally strong. Another psychological benefit was that some participants felt better emotionally (N = 15) as a result of physical activity. In this analysis, statements by participants were coded as "emotional benefit" if there was mention of increases in positive affect (i.e. happiness), decreases in negative affect, or stress relief (Stancil, 2007) [18]. A 35 year old female with a PASIPD score of 51.49 said, "That [water skiing], I think is just relaxing, you know its more of a relaxing type sport, you go out there and you just enjoy yourself and it really just a fun thing." Another participant who benefited emotionally was a 51 year-old female who had the highest score on the PASIPD with a 71.22. She stated, "I played rugby, softball. It was a good way to deal with the rage and um, the depression and all the stuff that came with it." A third participant, a 24 year-old female with a 35.6 on the PASIPD, added, "And the marathon now…it's more of a release for me. I can go out and push 20 miles a day and it's such a stress reliever for me, I just feel good afterwards." From the interview responses, it appeared that physical activity was a good way to reduce stress and depressive symptoms, as well as a source of fun for over half of the participants (Stancil, 2007) [18]. A third psychological benefit, behavioral benefits, was identified when participant mentioned a change in their day-to-day behavioral or health, routines. For instance, the 51 yearold female who had the

highest PASIPD score for this sample felt that through physical activity she developed the will to not quit, which forced her to be more creative, and brushes and things so that I didn't have to bend and…so I tend to be a bit more creative with the things I'm doing. Innovative. She also added, "Well I'm a smoker. So when I'm playing tennis or working out I'm not smoking. So that's a nice way to keep myself busy so I don't smoke." Another participant, a 21 year-old female who played college basketball and scored a 52.69 on the PASIPD, said, "Um, I think my ability to adapt to pretty much any environment and to pretty much anybody." A 24 year-old female basketball player (PASIPD = 16.59) added, "So it's helped me translate a lot more responsibilities into 'alright, that's how hard I work at basketball, I got to work that hard for school and other stuff. Finally, a marathoner and former college basketball player (PASIPD = 35.6) reported that athletics helped her become more outgoing. In fact, she revealed that she would have declined an interview before she became active in sports. I used to be a really, really shy person as a kid when I was a kid (Stancil, 2007) [18]. And through athletics I've been like…I can sit here and have this conversation with you, like a complete stranger, I don't know you. When I was younger I would have been like, No, I'm not doing an interview. In all, eight participants reported changes in behavior as a result of their sport and physical activity participation ranging from improved work ethic and adaptability to smoking less and being more outgoing. The fourth and final psychological benefit was labeled improved self-perception. This label referred to interviewees who viewed themselves differently as a result of participating in athletics or physical activity. Some participants discovered attributes about themselves that they were previously unaware of prior to their activity experiences (Stancil, 2007) [18]. One example is of a 22 year-old female with a PASIPD score of 35.33. She had one leg amputated as a result of a tumor when she was eleven years old and transferred to her current school for the sole reason to play wheelchair basketball. Another participant who became more extroverted after playing basketball was a 38 year- old male with cerebral palsy (PASPID = 25.17). He stated, "It's changed me a lot. I was just very introverted before going to college. And I saw all these different things. I saw people going through the same experience I was and it just opened me up." A 36 year-old male (PASIPD = 46.42) who, as a former athlete and current youth sport director, witnessed the positive impact of sports. He stated "you know it's a self-confidence kind of thing and to me you get a lot of that through athletics." This sentiment was echoed by another female college basketball player and Paralympic swimmer (PASIPD = 47.05), aged 20, who said, "Athletics provides a sense of confidence." Sport and physical activity also allowed some responders to see themselves in a different light. For example, one 47 year-old male who was a two-time world champion water skier and current basketball player said, "I came from a pretty small town, so that's when I really found out that I was more of a natural athlete than I knew because I had never had those opportunities when I was living in my small town." When asked about the impact of basketball on his life another 54 year-old male with a PASIPD score of 21.57, stated, "Certainly, to a degree it was my identity. It's given me an outlet for physical activities, I've made a lot of wonderful friends over the years and here now I am just down here enjoying the games" A total of 15 individuals cited changes in self-perception as one of the benefits of an active lifestyle (Stancil, 2007) [18]. These changes came in the form of improved self-confidence, improved self-esteem, and identifying oneself as an athlete. In all, 26 out of 26 participants reported some sort of psychological benefit from participating in sports and other physical activity. Some responders reported that they felt better emotionally because they were able to relieve stress, release aggression, increase their level of endorphins, or participate in an activity they viewed as enjoyable. Others reported they received cognitive benefits and were able to learn to concentrate and stay focused, stay positive, and learn about new sports (Stancil, 2007) [18]. As reported, many of the participants found that physical activity impacted their thoughts, feelings, and behaviors which included improved work ethic, the ability to adapt to people and places, decreased smoking behavior, and more outgoing towards strangers. Finally, over half (N = 15) of the participants reported that their self-perceptions were changed due to sports and physical activity (Stancil, 2007) [18]. The experiment 2 was conducted by (Pernambuco *et al*., 2014) [14]. The characteristics of the sample showed (Table 2) that active group had many systemic diseases, bmi was 27.45 ± 4.40 who signalized over weight, there was a partici-pant who return work and women compound major of par-ticipants (99 women and 26 men) (Pernambuco *et al*., 2014) [14]. The results obtained by active group were better after 16 weeks on QOL levels, showing that practice of phy- sical activity promoted modifications on perceptions with life. This corroborate with studies when he says that WHOQOL instruments measure a broad range of perception with life. When analyzing the domains separately, it can be ob- served that, although the group was active, apparently heal- thy and obtained the general level of satisfaction for qua- lity of life, Dom1 (which verifies pain and discomfort, energy and fatigue, sleep and rest) reach level significa- tive higher ($p < 0.05$) after intervention and when it compared with control group difference was significative positive ($p < 0.000$) for active group Similar results were found for Dom 2 (psychology) when it compared with control group (CG) after inter-vention, the difference was significative positive ($p < 0.000$) for AG, it capacities for relief depression and rein-force mental activities (Pernambuco *et al*., 2014) [14].

Table 2: Sample caracteristics (Pernambuco *et al*., 2014) [14].

n	51	valor p (SW)
age	66.63 ± 5.31	0.422
bmi	27.19 ± 4.00	0.564
scholarity	11 ± 6.13	×
ocupation	all retired	×
diabetes	10	×
hypertension	33	×
orthopedic problems	15	×
heart diseases	7	×
male	10	×
female	41	×

Legend: bmi: body mass index; SW: Shapiro-wilk.

The same occurred with Dom 3 (0.04) (related to mo-bility, activities of daily living; dependence on medicinal substances and medical aids; and work capacity), when make inner comparisons (0.04) and when it made intra groups, the results where positive for AG (0.006). The physical activity promotes relations among peo- ples, make those persons closer each other and Dom 4 (per- sonal relationships, social support and sexual activity) results demonstrated, when it compared with CG, differ- ence was significative positive, once more for AG (0.07) (Pernambuco *et al*., 2014) [14]. To observe spirituality, Dom 6 yielded results above 16.95, demonstrating a high level of belief in religious practices, all participants on both group integrates church activities. And finally the QoL index, called overall, show AG sig- nificative advantage when it reached values on intra groups comparisons (p = 0.012) that demonstrated physical in- terventions promotes subjective perceptions on QoL. Simultaneous measurements of self-reported and objec- tive measures of physical functioning should add a more integrated view for evaluation of therapeutic effective- ness, since the overall correlation was poor between ob- jective and subjective scores among individuals (Pernambuco *et al*., 2014) [14].

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