



DESCRIPTIVE STUDY

## Who are the people looking for the Pilates method?

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**Summary** The Pilates Method, a body–mind exercise approach originally developed by Joseph Pilates, is becoming widely popular, although without a concomitant development of scientific research. The purpose of this paper is to describe Pilates clients' characteristics, their goals regarding the Method and the prevalence and intensity of musculoskeletal pain among them. Three hundred and twenty-seven subjects were assessed before participation in Pilates exercises started. Variables of interest were age, sex, main goals with the Method, participation in physical activities, assistance by health professionals, main areas of musculoskeletal pain and subjective pain intensity. The results reveal that the majority of Pilates clients are middle-aged women who did not participate regularly in other exercise activities and who had some complaint of musculoskeletal pain. Despite high pain prevalence, only about one quarter of our sample sought the Pilates Method specifically for rehabilitation. This reveals a large patient population in which Pilates-based rehabilitation may be applicable.

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### Introduction

The following article is a descriptive study of a sample Pilates client base.

Although descriptive studies are not considered 'hard research,' they do provide foundational

information, in this case about people seeking Pilates body conditioning. Descriptive studies have value in that they can point to areas of needed future research studies.

The Pilates Method was originally developed by Joseph Pilates during the First World War (Muscolino and Cipriani, 2004; Latey, 2001) and brought to the United States in 1923 (Anderson and Spector, 2000). The initial concept mixed elements of gymnastics, martial arts, yoga and dance, focusing on the relationship between body and mental

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discipline (Latey, 2001; Lange et al., 2000). Joseph Pilates believed that the goal of a healthy person should be to attain a strong mind and use it to gain total control over his physical body (Pilates and Miller, 1945).

More recently, the traditional elements of the Pilates Method have been updated and incorporated into rehabilitation and fitness. This modern Pilates approach can be defined as a comprehensive body–mind conditioning, the main goals of which are efficient movement, core stability and enhanced performance (Akuthota and Nadler, 2004; Muscolino and Cipriani, 2004; Blum, 2002; Anderson and Spector, 2000). In terms of rehabilitation, the return to functional activities is also a primary objective since the Method encourages movement earlier in the treatment process by providing the needed assistance (Anderson and Spector, 2000).

The increasing popularity of the Pilates Method is evidenced by the participation of an estimated 5 million people practicing Pilates in the USA (Chang, 2000). Latey (2001) suggests that the method's broadening approach, differences in population demands for physical activity and increases in injury prevention are some of the reasons for this growing interest.

Unfortunately, the increasing number of Pilates Method's clients and practitioners has not been accompanied by a concomitant development of research. For example, a search conducted by the present authors for the keyword 'Pilates' in MEDLINE (August 2, 2005, pilates [tw]) returned only 13 results. Of those, only two studies utilized interventions, one quasi-experimental study whose outcome measure was leaping ability (Hutchinson et al., 1998) and one experimental study in which the intervention was *resistance exercise* (Pilates-based but not precisely Pilates exercises) and primary outcomes measures were *adherence and participation* (Mallery et al., 2003). The authors are not aware of published controlled or randomized clinical trials regarding Pilates Method efficacy. In a review investigating physical treatment for chronic low back pain, Maher (2004) considered Pilates therapy an unevaluated treatment in which efficacy is unknown. The authors are also not aware of any descriptive study focusing on Pilates clients' characteristics.

The purpose of this paper is to describe a population sample of Pilates participants. Our interest is to understand the profile of people interested in Pilates and what their goals are regarding the Method. A second objective is to examine the prevalence and subjective intensity of musculoskeletal pain in subjects presenting for Pilates training.

## Methods

The study setting was a Pilates studio located in Belo Horizonte, Minas Gerais, Brazil. Our sample consisted of subjects who were assessed before participation in Pilates exercises. Data were obtained from physical assessment forms routinely used in the studio. Subjects whose assessments were performed over a specified 1 year and 10 months period (from January 2003 to November 2004) and whose assessment forms were satisfactorily completed were included. All participants of this study were kept anonymous, and no personal information was revealed.

The assessments were performed by physical therapists trained in Pilates-based rehabilitation. Data was manually extracted and compiled by a single author (MS). Variables of interest were age, sex, main goals with the Method, participation in other physical activities (subjects were considered inactive if they were not undertaking other form of exercise with a determined frequency, in the last month), assistance by other health professionals, complaint of musculoskeletal pain or disorder (affected anatomical site) and subjective pain intensity (verbal rating scale 0–10, with 0 meaning absence of pain and 10 being the worst pain ever experienced). The participants were allowed to freely report on variables, i.e. there were no closed answers in the assessment forms. In regards to goals with the Method, all related goals were considered for data analysis. Alternatively, for musculoskeletal pain, when participants reported more than one area of complaint, only the area with highest pain intensity was considered for analysis.

Statistical analysis was performed with SPSS 10.0 for Windows (SPSS, Chicago, IL, USA). Normality was checked by histograms, Q–Q plots and the Komolgorov–Smirnov test (Chan, 2003). Continuous data were presented in descriptive statistics and categorical data were presented in percentages.

## Results

Three hundred and twenty-seven subjects were included in the study. There was a clear preponderance of women: 266 (81.3%) females versus 61 (18.7%) males. The mean age of the sample was 42 years old (range = 8–77, SD = 13.27). The median age was also 42 years old. This exact same value for mean and median revealed a very homogenous sample in regards to age. Age plots (Fig. 1) and test of normality ( $P = 0.20$ ) revealed a normal distribution.

Posture was the most desirable goal, being reported by 38.8% of the participants surveyed.

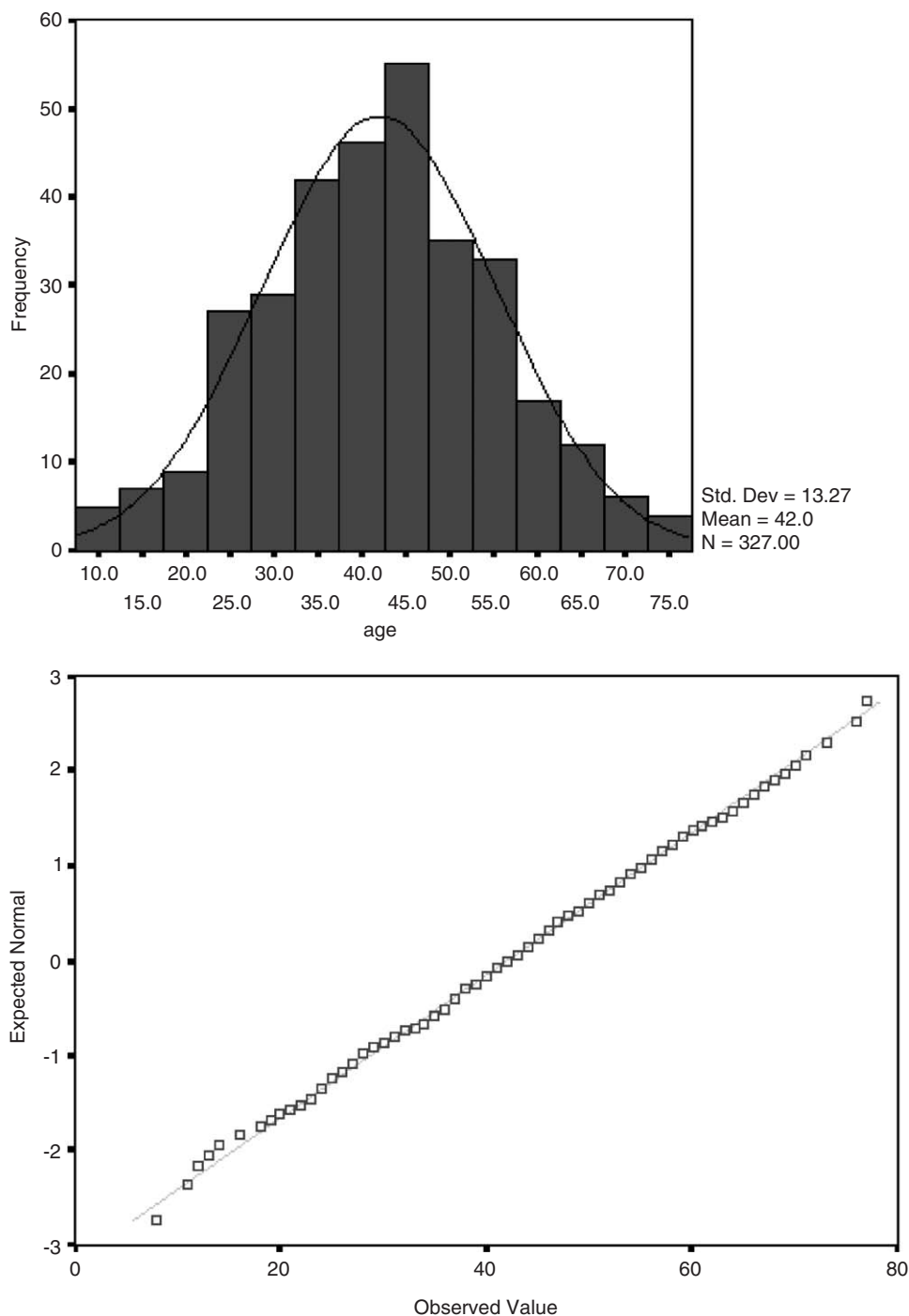


Figure 1 Histogram and Q-Q plot of age distribution.

It was followed by flexibility (32.1%) and rehabilitation goals such as pain relief and treatment of musculoskeletal disorders (24.2%). Other goals reported were: muscle strength (19.0%), muscle leanness (18.4%), aesthetics (16.8%), overall wellness (16.8%), physical activity practice (13.2%), relaxation (12.8%), endurance conditioning (6.1%) and improvement of respiratory function (4.9%).

In all, 48.9% of the participants reported regular visits to physicians or other health care professionals. With respect to regular physical activities reports, most participants (54.7%) were inactive at the time of their assessment.

A large number of individuals (240; 73.4%) had complaints of some musculoskeletal pain or discomfort. The lumbar spine was the most commonly affected anatomical site, with 72 cases (30% of all

**Table 1** Distribution of musculoskeletal complaints by anatomical site.

Location	Frequency
Lumbar spine	72 (30.00)
Cervical spine	44 (18.33)
Knee	35 (14.58)
Shoulder	19 (7.92)
Scapula/upper trapezius	18 (7.50)
Global/unspecific	11 (4.58)
Foot/ankle	10 (4.17)
Thoracic spine	5 (2.08)
Hip	5 (2.08)
Sacroiliac	5 (2.08)
Lower-extremity (diffuse)	5 (2.08)
Upper-extremity (diffuse)	5 (2.08)
Wrist	2 (0.83)
Coccyx	2 (0.83)
Elbow	1 (0.42)
Pubis	1 (0.42)

Values are numbers with percentages in parentheses. Only the main affected area (higher pain intensity) was considered when subjects indicated multiple pain areas.

complaints). The other most frequently cited sources of pain were the cervical spine with 44 occurrences (18.3%) and the knee joint with 35 occurrences (14.6%). Table 1 shows all affected areas and their frequencies.

Subjective pain intensity scores were only available for 148 individuals (61.6% of the musculoskeletal complaint cases). Therefore, there were 92 pain intensity missing values due to lack of application of a verbal numeric rating scale during the assessments. Considering only the available data, the mean pain value was 6.1 (range 1–10, SD = 2.25). In contrast with age, pain did not show normal distribution in the statistical test value ( $P = 0.0001$ ), yet its distribution was still classified as normal based on histogram and Q–Q plots (Fig. 2) (for details of normality assessment, see Chan, 2003).

## Discussion

This study provided an overview of the characteristics of Pilates clients. Most subjects in our sample were middle-aged women who did not participate regularly in other exercise activities, and who had some complaint of musculoskeletal pain or disorder. Our age findings are in agreement with the sample described in an observational study that assessed the effects of Pilates training on flexibility, body composition and health status (Segal et al.,

2004). The male proportion in our sample, however, was slightly greater (18.7%) when compared to Segal's study (4.3%). In regards to musculoskeletal pain, these authors did not specifically assess it; instead, it was included in an overall health status outcome, so direct comparisons with our results could not be performed. No other variables matched and no further comparisons between studies were possible.

In terms of individual goals, it was clear that most people in our study looked for Pilates exercises in order to improve their posture and flexibility. Since posture and flexibility improvements are Pilates Method claims (Segal et al., 2004; Pilates and Miller, 1945), this was an expected finding. We also attribute this finding to the relationship usually assumed between body posture and musculoskeletal disorders, although the scientific literature shows controversial findings regarding this subject (McAviney et al., 2005; Bullock et al., 2005; Julius et al., 2004). It is important to note that Segal et al. (2004) found no significant changes in posture but significant flexibility improvement after Pilates training. However, these authors utilize height and fingertip-to-floor distance as surrogates for posture and flexibility, respectively, which in our view can reflect limited operational definitions of this constructs. In another study, Blum (2002) described functional improvements when Pilates Method was used as a co-intervention for chiropractic treatment of a patient with scoliosis in a case report, but no mentions to posture modifications were made.

A total of 54.7% of the participants were inactive at the time of their assessment, i.e. they were not participating regularly in other physical activities for at least 1 month. Only a very small percentage (13.2%) reported physical activity practice was a primary goal. However, this may be due to a variable's overlap, since subjects may have rather pointed out physical activities benefits (e.g. overall wellness, 16.8%). The importance of practicing some kind of physical activity for health improvement has become largely known by the general population, and its preventive efficacy finds support in recent systematic reviews and clinical trials, for conditions such as falls in elderly people (Chang et al., 2004), osteoarthritis (Thomas et al., 2002), hypertension (Whelton et al., 2002; Kelley and Kelley, 2000) and diabetes (Boulé et al., 2001). Although there is no evidence regarding Pilates Method efficacy for these disorders, it is possible that people looked for Pilates with this interest, since these benefits are ascribed to physical activity in a general manner.

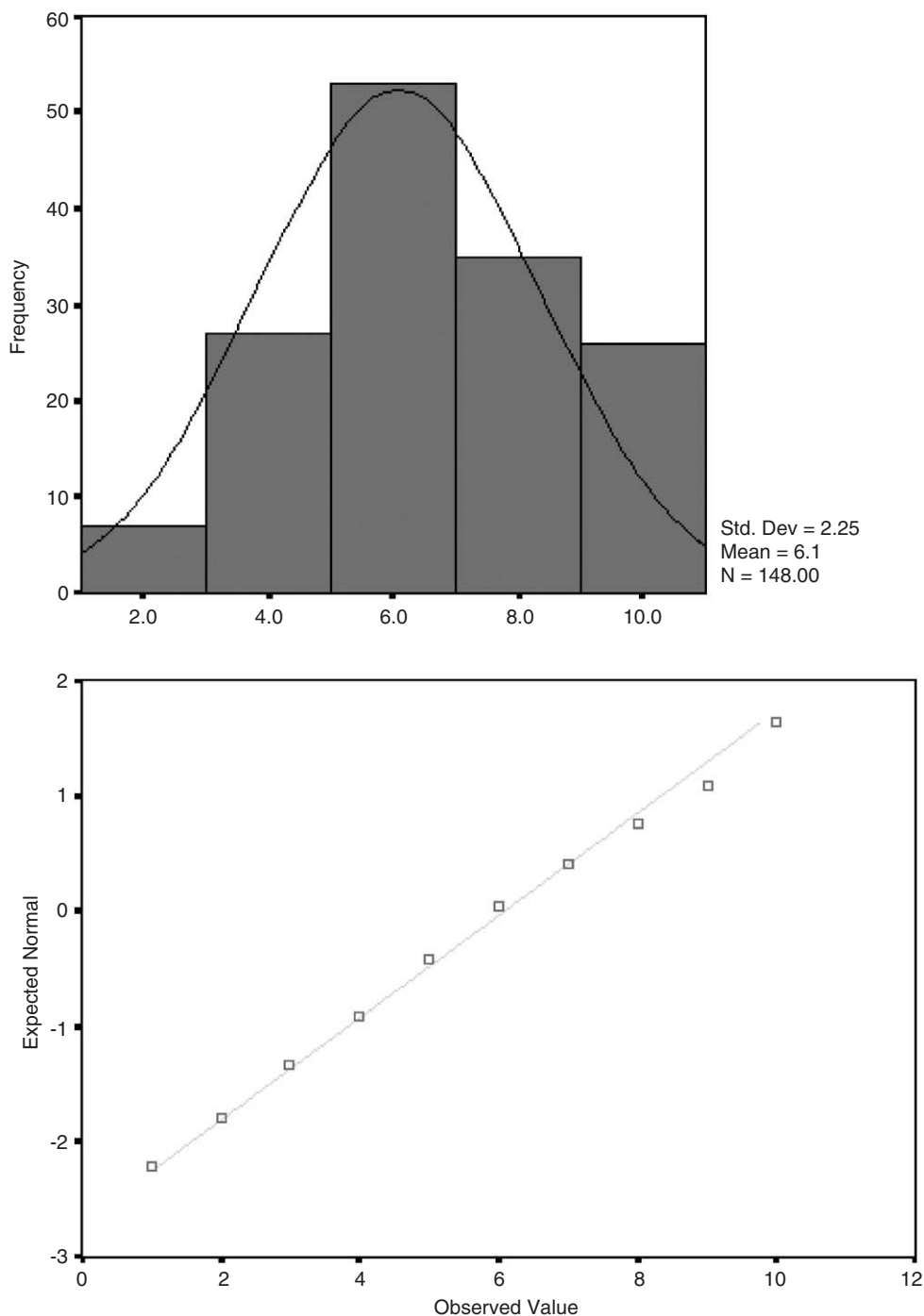


Figure 2 Histogram and Q-Q plot of pain intensity distribution.

Psychological benefits of physical exercise have also been largely demonstrated, from elevation of mood state to the adjunctive treatment of disorders such as depression and anxiety (Craft and Perna, 2004; Scully et al., 1998). Pilates Method's claims of body-mind conditioning and to bring a positive movement experience may reinforce the attraction of clients looking for psychological well-

being. In our study, 12.8% of the participants reported relaxation as a primary goal.

Only 24% of our sample described rehabilitation as a primary reason for practicing Pilates exercises, although 73% reported some musculoskeletal pain or disorder. This may be an indication that the role of the Pilates Method as a rehabilitation technique is still unclear or unknown by many of the Pilates

clients. Another possibility is that pain in our sample was not significant enough to demand a therapeutic intervention, despite subjective pain scores had a mean of 6 points, which we consider a moderate pain level. Of course, limitations in our pain evaluation, particularly the large proportion of pain intensity missing data, qualifies the interpretations made from these pain scores. In addition, [Farrar et al. \(2001\)](#) stated that baseline pain measurements can show a large variation between patients due to different interpretations of the pain scale. Therefore, caution should be exercised when analyzing these results.

The lumbar spine, followed by the cervical spine and the knee joint, were the most commonly affected sites. In fact, these three anatomical areas taken together represent close to 63% of all complaints. It is interesting to note that spine and knee disorders are usually of a complex nature, frequently becoming chronic and recurrent, and may lead to severe degrees of disability ([van Baar et al., 1998](#)). [Segal et al. \(2004\)](#) suggested that incomplete efficacy of current therapies for the treatment of chronic pain may be one of the reasons why people look for other exercise regimens like the Pilates Method.

For clients with low back pain in particular (30% of all musculoskeletal complaints and 22% of our sample), Pilates focus on core strengthening might had been a reason for their interest in the Method. Recent papers ([Akuthota and Nadler, 2004](#); [Comerford and Mottram, 2001](#)) point to the overriding importance of lumbar stability training and its impact on rehabilitation programs. As previously stated, core stability is one of the main goals of the Pilates Method and it is asserted to retrain deep trunk inhibited muscles, improving muscular active stiffness by co-contraction and thus increasing pelvic and lumbar stability ([Akuthota and Nadler, 2004](#); [Richardson and Jull, 1995](#)). Recently, [Herrington and Davies \(2005\)](#) observed that asymptomatic subjects trained in Pilates exercises performed better on transversus abdominis isolation and lumbo-pelvic stability tests than subjects who practice regular abdominal curl exercises. Although these concepts and findings are quite technical, clients might be aware of them because scientific information is becoming more and more available for the general public. Statements from people who experienced successful rehabilitation outcomes with Pilates exercises may also be a way of clients becoming aware of the Method's therapeutic role.

## Conclusion

People presenting for Pilates training are predominantly middle-aged women, physically inactive and

mainly interested in improving their posture and flexibility. Pain and disability reduction were apparently secondary goals, since only about one quarter of our sample sought the Pilates Method specifically for rehabilitation. On the other hand, the majority of our subjects reported some pain or musculoskeletal discomfort. This reveals a patient population in which Pilates-based rehabilitation may be applicable. Despite theoretical basis and observational positive results, future research utilizing experimental design is required to determine Pilates effectiveness as a therapeutic or prophylactic intervention.

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