



## Research Article

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# Somatic Education and Mind-Body Disciplines: Exploring the Effects of the Pilates Method on Life Satisfaction, Mindfulness and Self-Compassion

Aglaia Zafeiroudi

Charilaos Kouthouris

Department of Physical Education and Sport Sciences,  
University of Thessaly, Argonafton and Filellinon,  
Volos 382 21, Greece

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## Abstract

*This study was aimed at exploring the potential of the Pilates Method of somatic education as a tool for enhancing factors influencing wellbeing. Specifically, the study focused on investigating whether Pilates Method mat-based and equipment practices affects mindfulness, self-compassion and life satisfaction among adults. A total of 129 adults (16 men and 113 women) participated in this study. Participants completed the Mindful Attention Awareness Scale, Self-Compassion Scale and Satisfaction with Life Scale, and provided additional information regarding the frequency of participation in Pilates practices and demographics. Correlation analysis indicated strong relationships between variables. One-way multivariate analysis of variance was used to determine differences in mindfulness, self-compassion and life satisfaction, and revealed significant differences between Pilates subgroups. Bonferroni post hoc tests showed that participants who practiced Pilates as many as five times per week scored higher than those participating once or twice. Regression analyses indicated that mindfulness and self-compassion were good predictors of life satisfaction. Pilates positively correlated with factors that enhance positive psychology processes and wellbeing. The major finding was that Pilates practitioners can enter into a different relationship with bodily movement, transcending the physical body, fitness and exercise techniques. Further empirical research is required to explore how the Pilates Method shapes somatic experiences. Implications of the Pilates technique as a somatic and mind-body method in physical and dance education are presented.*

**Keywords:** dance, yoga, sensory motor learning, breathing, aesthetics, creativity, wellbeing, fitness, physical education, positive psychology

## 1. Introduction

The Pilates Method has become a very commonly used practice throughout Europe and the West in recent decades. Pilates largely avoids high impact, high power output, and heavy muscular and skeletal loading. Influenced by the philosophy of yoga, Pilates Method was described by its creator, Joseph Pilates, as a form of exercise that benefits the body, mind and spirit as a whole (Pilates & Miller, 2000a; 2000b). It is based on physical exercises that are not done arbitrarily but are performed

according to traditional principles, such as centering, concentration, control, precision, flow and breathing. Exercises can be mat-based or can involve specific equipment. The ultimate goals are health, happiness, wellness and quality of life. Pilates's philosophy, is similar to the theory of somatic education and the mind-body approach. Dance is also part of somatic education: with practical and pedagogical approaches, beneficial results can be achieved in the aesthetics of dance. History shows a strong connection between dance and Pilates on many levels (Rouhiainen, 2010). Researchers have identified Pilates as a form of physical education that can affect consciousness, spirituality and general wellbeing (Bolsanello, 2015; Caldwell et al., 2013; Roble, 2015). The focus on breathing and on the present moment, the attention to alignment and the perception of the movement and the space, and the recognition of various sensations reinforce the view that Pilates is not a fitness training method aimed only at improving physical condition, and increasing muscle strength and flexibility. Pilates, according its tradition, aims at sensory autonomy of the practitioner, providing a tool to enhance mental and psychological health.

The general aim of the present study was to assess whether Pilates, through the basic traditional principles of increasing awareness of posture and movements, might help people make specific changes in reducing unwanted emotions, skills and behaviors, and promoting a more positive life experience. The purpose of this research was to reinforce the view that Pilates Method is associated with the field of somatic education and mind-body disciplines benefiting psychological, mental health and general wellbeing. More specifically, the present study focused on investigating whether adult involvement in Pilates Method mat-based and equipment practices might affect mindfulness, self-compassion and life satisfaction—three factors that influence wellbeing.

## 2. Literature Review

### 2.1 Somatic education and the mind-body approach

Somatic education is a dynamic concept, and the definition of what constitutes a somatic practice remains an exciting area in diverse fields. Somatic education approaches humans holistically and refers to the physical body, mind, emotions, spirit and environmental connection (Bolsanello, 2015). Somatic education approaches learning as an internalized process while changes in the body occur through sensory-motor methods (Hanna, 1998). Somatic education is based on the idea that by gaining conscious awareness of the processes of the physical body, individuals can achieve greater control over them. This control and the knowledge gained become an experience constituting the first important step toward change. By learning to regain awareness, sensation and motor control of muscles—an educational process that can be achieved only through movement—the brain can remember how to relax and move the muscles properly (Hanna, 1998). This process of sensory motor training improves muscle function and enhances sensory awareness.

Raypole (2020) has noted that somatic education describes all techniques using the connection between the mind and body to help people survey their internal selves and listen to the body's signals indicating imbalances, discomfort and areas experiencing intense pain. Such practices allow practitioners to access more information regarding how they carry experiences in their bodies. Raypole (2020) has also stated that experts in somatic education believe that such knowledge, when combined with natural touch and movement, aids in individual wellness and healing. Similarly, Buono (2019) has reported that somatic education students are highly capable of understanding themselves, what occurs externally and internally through bodily learning and movement, and how their lives interconnect with those of others around them.

The term “mind-body” is used to describe a variety of movements and techniques aimed at bringing connection and integration to the mind and body, to improve physical and mental health; examples include the Feldenkrais Method, the Alexander Technique and Laban movement. In a report for Atrium Health, Rice (n.d.) has noted that mind-body activities focus on the communication between the body and the mind, and the powerful ways through which the spiritual,

social, mental and emotional factors in the environment influence health and wellbeing. Rice (n.d.) lists 13 classifications for mind-body types of exercises: music and art, yoga, dance and exercise, having support groups, psychotherapy, biofeedback, aromatherapy, autogenic training, visualization, imagery, hypnosis, meditation and relation. Overall, most of these interventions focus on the mind, alter consciousness, and involve fantasy, memory, feelings, thoughts and perceptions. Furthermore, they stimulate smell and regulate various psychological functions.

The term mind-body was coined to describe various practices, such as hypnosis, biofeedback, relaxation techniques, meditation and guided imagery, which involve a sense of self-responsibility that use the association between the body and mind to promote health and wellbeing (Pallipedia Organization, n.d.). In addition, mind-body approaches are based on the concept that feelings, mental images and thoughts are major determinants of the physical wellbeing of an individual. However, despite the use of body positions, Saravanakumar et al. (2018) have suggested that yoga remains one of the best mind-body approaches, because it uses breathing and meditation exercises to achieve mental attitudes associated with healing, wellbeing and health. Furthermore, Saravanakumar et al. (2018) have noted that tai chi is also used as a mind-body approach, which is based on smooth and slow motions that help build robust quality of life through interaction of physical, emotional and intellectual wellness domains.

## 2.2 Pilates Method and somatic practices

The principle of Pilates includes concentration, control, centering, flowing movement, precision and breathing (Pilates & Miller, 2000). First, Pilates training requires practitioners to place complete mental focus on a given body area. Concentration helps draw attention to the area of the body being focused on, thus potentially augmenting neuromuscular function and movement quality (Işık & Başar, 2021). Second, Pilates training contracts the appropriate muscles at the right moment, so that the intended movement occurs. Thus, the control principle defines every stage of movement and helps in reducing injury (Işık & Başar, 2021). Third, according to the centering principle, the hip complex, lumbar region and abdomen have a myriad of muscles, such as the diaphragm, transverse abdominus, iliopsoas, quadratus lumborum and the multifidus, and all movements for the pelvis, thorax, all extremities, shoulders and head should be centered on a particular base. Fourth, the fluency principle stresses that for Pilates training, mind-body interactions are continued for all movement flows. Transitions and movements should occur in a relatively fluid and slow manner to allow people to feel and achieve better training effects (Işık & Başar, 2021). This adaptive process also includes concentration and breathing. Fifth, according to the precision principle, Pilates training is often centered on the quality of the training rather than its quantity. The quality of movement is improved through precise and correct performance. Contraction and activation of the target muscles rely on proper movement. Finally, according to the breathing principle, practitioners are directed to breathe appropriately during the exercises. Their core stability depends on correct breathing and respiration.

Broad literature supports the connections among Pilates, dancing and somatic practices. In the past decade, widespread research has integrated somatic practices into dance curricula to facilitate links between the body and the mind. In particular, Weber (2019) and Barrows and Barrows (2021) have stated that the Pilates Method has often been applied in somatic practices that were originally used extensively by athletes and dancers, and eventually gained attention from the general public. More specifically, Weber (2019) has noted that the Pilates Method was originally developed to establish harmony between the mind and body through combining aspects of breathing awareness and mental focus with the physicality of sports, gymnastics and dancing. In fact, between the 1920s and the 1970s, many clients in the dancing field worked with Pilates, thus resulting in robust development of this method. In fact, anecdotal evidence provided by Ehrenberg (2019) and Yin et al. (2019) indicates that the Pilates Method increases flexibility, strength and body awareness for the spine, and helps dancers develop multiple motions.

Most of the command style of instruction in Pilates is associated with acrobatic physical skills. Yet, recent research has revealed profound changes in the instructions applied in dancing as awareness of breathing, and the emphasis on alignment to foster mindfulness, spirituality and wellbeing (Zafeiroudi, 2021). Continued application in dancing has been demonstrated to improve not only dance aesthetics, expressiveness and creativity, but also sleep quality, stress levels and mood. Although Pilates is applied in dancing to improve dancers' body movement and muscle memory, the literature is increasingly focusing on other effects on mood, stress and sleep quality. Koch et al. (2019) based on observational and qualitative data, provides evidence that Pilates affects mindfulness among dancers and improves wellbeing.

Somatic education has received substantial academic attention in various dancing curricula, and efforts have been made to expand the definition of somatic education. Somatics has been defined by Rato and Alves (2019) as the science and art of interrelation processes among the environment, biological functioning and awareness, all of which are understood to be in synergy. The benefits of mindfulness, somatic exercises and Pilates include increased body awareness, and improved alignment, strength and a sense of sensory authority. As more dancers embrace somatic training in dancing, practitioners continue to refine their body perceptions, eventually improving their techniques, developing various expressive sensory capacity and preventing injuries (Mullan, 2014).

### 2.3 Pilates, life satisfaction, mindfulness and self-compassion

Life satisfaction refers to having a favorable attitude toward an individual's life rather than having a biased attitude based on one's current emotions and feelings (Kardas et al., 2019). Verma and Kumar (2020) believe that life satisfaction determines how people depict their feelings, moods or emotions, and how they feel about their future options and directions. In particular, Verma and Kumar (2020) have asserted that life satisfaction measures wellbeing, which is evaluated in terms of people's self-perceived abilities in coping with their daily lives, self-concerns, achieved goals, relationship satisfaction and mood.

In a study examining the effects of 16 weeks of Pilates activity, Curi et al. (2018) have shown that exposure to Pilates exercises improves life satisfaction and functional autonomy in older adults. In another study by Honório et al. (2021), Pilates-based mat exercises have been found to strongly influence life satisfaction and peoples' perception of being appreciated by others. Honório et al. (2021) have also shown that Pilates exercises influence the perception of health status in women, the self-concept of their physical wellness, and how they perceive their functionality and their physical appearance. Honório et al. (2021) have shown that these variables improve in women after practicing Pilates mat-based exercises for 6 months. Sharma et al. (2018) have also reported similar findings showing that Pilates-based activities robustly influence the quality of sleep and life. In particular, Sharma et al. (2018) have found that Pilates-based exercises strongly affect life satisfaction, quality of life and sleep quality. A randomized controlled trial by Miyamoto et al. (2018) has indicated a positive correlation between chronic low back pain in a 16-week Pilates program and life satisfaction scores. Finally, a randomized controlled study of 24 women 61–67 years of age has indicated that those who performed 30-minute Pilates mat and equipment-based sessions twice per week for 6 months experienced significant improvements in quality of life (Liposcki et al., 2019).

Mindfulness refers to the fundamental human ability to become entirely present while being aware of one's position and actions, and not overly overwhelmed or reactive to surrounding happenings (Saletnik et al., 2018; Singh et al., 2020). Kabat-Zinn (1994) has stated that mindfulness involves constant attention to continuous sensory experience without judgment or further processing. Brown and Ryan (2003) and Brown et al. (2007) have reported that mindfulness is the attention to, and awareness of, external and internal experiences during which these experiences occur. The same researchers have defined dispositional mindfulness as the tendency of individuals to be conscious in everyday life. Many studies have suggested that increased mindfulness enhances overall wellbeing (Falkenström, 2010; Fenzel & Richardson, 2022; Kong, Wang & Zhao, 2014; Lomas et

al., 2017).

The Pilates Method focuses on overall improvement. Gulsen (2019) has noted that Pilates training is a mind-body practice using mindful and gentle body motions to enhance physical and mental wellbeing. Furthermore, Barrows and Barrows (2021) have postulated that, as a form of somatic education, Pilates has the potential to cultivate mindfulness. Gulsen (2019), in a qualitative study of 80 university students equally divided into a Pilates and control groups, has shown that Pilates training improves social appearance and body awareness. In addition, Gulsen (2019, p.57) has reported that "Pilates exercises significantly increased mindfulness." The influence of Pilates on mindfulness appears to mediate the links to various psychological indices, such as the quality of sleep, perceived stress, mood and self-efficacy. Stanly and Selvi (2018) have found that Pilates and yoga also promote mindfulness. Nonetheless, most of the evidence presented in several reviewed studies has relied on observational and qualitative data to validate these findings. According to many researchers, mindfulness is related to life satisfaction: high levels of mindfulness are associated with greater life satisfaction (Brown et al., 2009, Brown & Ryan, 2003; Kong, Wang & Zhao, 2014). Mindfulness encourages perception and effective regulation of emotions that promote life satisfaction (Kong, Wang & Zhao, 2014). In addition, mindfulness has been found to be a good predictor of life satisfaction (Ari et al., 2020; Wang & Kong, 2020).

Beyond mindfulness, self-compassion also nurtures positive mental health. Self-compassion is the human ability to self-regulate emotions regarding the self, including kindness rather than self-judgment; experiencing commonality with others rather than isolation; and having mindful awareness rather than over-identification, thus allowing people to maintain a sense of perspective and balance regarding personal suffering (Neff, 2003; Neff, 2009; Neff & McGehee, 2010; Rybak, 2012). According to Alderman (2020), Jarecki et al. (2020) and Carmack and Clow (2019), self-compassion is the ability to be warm and empathetic toward oneself when one feels inadequate, fails or suffers, rather than ignoring the pain and engaging in self-criticism. In particular, having self-compassion implies acceptance of one's best and worst mistakes, not changing one's natural self, not being hard on oneself, etc.

In a study examining the effects of Zumba and Pilates exercises on communication skills, happiness and self-esteem, Özdenk and Imamoglu (2019) have noted that Pilates significantly increases communication skills, happiness and self-esteem, which are closely linked to self-compassion. Recent studies have also shown that self-compassion is intrinsically associated with mindfulness, and mindfulness promotes greater self-compassion (Bluth & Blanton, 2014). Furthermore, self-compassion enhances life satisfaction. People with higher self-compassion undergo psychological processes that improve life satisfaction (Li et al., 2021).

In contrast, a study examining the effects of mind-body exercises on sustainable psychological wellbeing, conducted by Kim et al. (2019), has shown that Pilates significantly increases positive emotions, thus supporting a positive body image. Similarly, Stapleton et al. (2018) have reported that, among women 18-75 years of age, those who engaged in Pilates had high self-esteem and more self-compassion, thus helping decrease the effects of harmful coping mechanisms. In short, Pilates exercises have a positive effect on self-compassion.

Overall, a myriad of literature has examined the effects of Pilates on diverse variables. The present research analyzed the effects of the Pilates Method on mindfulness, self-compassion and life satisfaction, and their correlations among Pilates practitioners. Although literature examining all three of these variables together is limited, various peer-reviewed studies have examined them independently, providing extensive insights regarding the positive effects of Pilates exercises. Few studies have examined the correlations among mindfulness, self-compassion and life satisfaction in Pilates, somatic practices, or other fields.

For instance, Mantelou and Karakasidou (2018) have used the positive and negative affect scale, life satisfaction scale and self-compassion scale to examine the effects of Pilates on mindfulness, self-compassion and life satisfaction. Mantelou and Karakasidou (2018) have shown that such mindful intervention programs are needed to ensure wellbeing, because they affect self-compassion and life

satisfaction. Other reviewed literature has shown intricate relationships of Pilates with mindfulness, self-compassion and life satisfaction, owing to the effects of these somatic practices on sensory authority, increased body awareness, augmented alignment and strength. The Pilates Method has been shown to enhance mindfulness, thus increasing other associated wellbeing measures, such as life satisfaction and self-compassion.

The present study aimed to explore the potential of the Pilates Method of somatic education as a tool for enhancing mindfulness, self-compassion and life satisfaction among adults. According to previous findings, we hypothesized that mindfulness and self-compassion would have a strong positive relationship with life satisfaction and that both variables would contribute to life satisfaction.

### 3. Research Methods

#### 3.1 Participants

This research included 129 Pilates participants, of whom 12.4% were men and 87.6% were women. Slightly more than half the participants were single (55.8%); 45.7% held a bachelor degree, and 29.5% held a post graduate degree. Most were employees in the private or public sectors (65.7%), and 55.9% earned average annual incomes. Among the participants, 20.2% had been attending Pilates practice five or more times per week, 62.8% had been attending one or two times per week, and 17.1% had been attending three or four times per week. The demographic characteristics of the participants are presented in Table 1.

Table 1: Demographic characteristics of participants

	n	%		n	%
Gender			Age		
Male	16	12.4	18-29	39	30.2
Female	113	87.6	30-39	34	26.4
Family			40-49	30	23.3
Married	45	34.9	>50	26	20.1
Single	72	55.8	Weekly participation		
Other	12	9.3	1-2 times	81	62.8
Education			3-4 times	22	17.1
Secondary	32	24.8	≥5 times	26	20.2
Higher	59	45.7	Occupation		
Post graduate	38	29.5	Employees	71	55
Income			Own business	25	19.4
Low	50	38.8	Unemployed	24	18.6
Average	71	55	Retired	9	7
High	8	6.2			

#### 3.2 Instruments

To assess mindfulness, we administered the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003; Greek version of the MAAS: Mantzios, Wilson & Giannou, 2015). The MAAS consists of 15 brief statements describing experiences (e.g., “I could be experiencing some emotion and not be conscious of it until sometime later”). Respondents were asked to rate their agreement on a 6-point Likert-type scale (1 = almost always; 6 = almost never). This instrument measurement has been demonstrated to be reliable and valid for assessing mindfulness in the Greek population (Mantzios, Wilson & Giannou, 2015). In this study, the scale had a Cronbach alpha coefficient of .88. In addition, because the scale was expressed by a single factor, the 15 items were computed as a single variable representing total mindfulness. Higher average total scores reflected greater levels of mindfulness.

The Self-Compassion Scale (SCS; Neff, 2003; Greek version of the SCS: Mantzios, Wilson & Giannou, 2015) comprises 26 items measuring the degree to which individuals extend self-compassion. The SCS includes six subscales: self-kindness (five items; e.g., “I’m tolerant of my own flaws and inadequacies”), self-judgment (five items; e.g., “When I see aspects of myself that I do not like, I get down on myself”), common humanity (four items; e.g., “I try to see my failings as part of the human condition”), isolation (four items; e.g., “When I fail at something that’s important to me, I tend to feel alone in my failure”), mindfulness (four items; e.g., “When I’m feeling down, I try to approach my feelings with curiosity and openness”) and over-identification (four items; e.g., “When something painful occurs, I tend to blow the incident out of proportion”). Participants indicated their responses to each item on a 5-point scale ranging from 1 (almost never) to 5 (almost always). Scores on the SCS have been shown to be valid and reliable in the Greek population (e.g., Mantzios, Wilson & Giannou, 2015). In this study, the scale had a Cronbach alpha coefficient of .91. The 26 items were computed as a single variable representing total self-compassion. Higher average total scores reflected greater levels of self-compassion.

Life satisfaction was assessed with the Satisfaction with Life Scale (SWLS) (Diener, Emmons, Larsen, & Griffin, 1985; Greek version of the SWLS: Patsiaouras et al., 2003), a commonly used measure of subjective wellbeing. The SWLS consists of five brief statements assessing participants’ general cognitive appraisal of their overall satisfaction with life and of their lives as being close to ideal. It includes items such as “I am satisfied with my life” and “In most ways, my life is close to my ideal.” Participants indicated the extent to which they agreed or strongly disagreed with each statement, on a 7-point scale. The Greek version of the SWLS has been demonstrated to be a reliable and valid measurement in assessing life satisfaction in Greek adults (e.g., Patsiaouras et al., 2003). In this study, the Cronbach alpha coefficient for the SWLS was .71. All items were summed to obtain an overall SWLS score. Higher average total scores reflected greater life satisfaction.

### 3.3 Procedure

Participants came from studios and sport centers providing Pilates instruction in Greece, specifically from the cities of Athens, Thessaloniki and Larissa. Participants came from classes taught by experienced certified instructors in the Pilates Method, whose lessons were based on the traditional method and the basic principles of Pilates. From these classes, participants meeting the following criteria were selected: i) practice on a regular basis for the prior 2 years in individual and group practices using mat and equipment Pilates, ii) no interruption for more than 2 months during the prior 2 years and iii) no regular involvement in other sports, or other mind-body programs or sessions of consciousness and positive psychology during the prior year. People who did not meet the above criteria for participation were excluded. The survey was conducted from 2018 to 2020 before the implementation of COVID-19 restriction measures. Participants completed a written questionnaire in the presence of the researchers in the practice area after the end of the session.

## 4. Results

### 4.1 Descriptive statistics and intercorrelations between variables

Means and standard deviations for study’s variables are shown in Table 2. The skewness for the three scales ranged from  $-0.457$  to  $0.524$ , and the kurtosis ranged from  $-0.537$  to  $0.104$ ; therefore, the data obtained were considered normally distributed. The intercorrelations among mindfulness, self-compassion and life satisfaction variables are shown in Table 2. As shown, the correlations were statistically significant ( $p < .001$ ), forming a basis for subsequent hierarchical multiple regression analysis.

**Table 2:** Descriptive statistics and correlations between variables

Variables	M	S. D.	Skewness	Kurtosis	Mindful	Self-com	Life-sat
Mindful	43.74	7.267	-0.143	-0.318	-		
Self-com	38.16	6.567	0.026	-0.135	.411**	-	
Life-sat satisfaction	23.98	5.616	-0.560	0.712	.292**	.426**	-

4.2 Wellbeing factors as a function of Pilates participation

In terms of frequency of Pilates participation, 81 participants (62.8%) reported participating in Pilates courses one or two times per week, 22 participants (17.1%) reported participating three or four times, and 26 participants (20.2%) reported participating more than five times per week in Pilates practices. A one-way MANOVA was conducted to examine the effects of frequency of participation in Pilates processes. The analysis revealed a significant multivariate effect,  $F_{(6, 244)} = 3.075$   $p < .01$ ,  $\eta^2 = .070$ . Examination of the univariate effects showed significant effects for the variables of mindfulness,  $F(2, 123) = 4.362$ ,  $p < .05$ ,  $\eta^2 = .066$ , self-compassion,  $F(2, 123) = 6.506$ ,  $p < .01$ ,  $\eta^2 = .096$  and life satisfaction  $F(2, 123) = 5.180$ ,  $p < .01$ ,  $\eta^2 = .078$ . Bonferroni post-hoc tests of the main effect indicated significant differences only between subgroups of participation in Pilates practice five or more times per week, and participation in Pilates practice one or two times per week. The scores are presented in Table 3.

**Table 3:** Differences in Pilates practice participation

Participation in Pilates practice	Mindfulness	Self-compassion	Life-satisfaction
	M (SD)	M (SD)	M (SD)
1-2 times	3.824 (0.611)	3.281 (0.605)	4.208 (1.00)
3-4 times	3.987 (0.684)	3.553 (0.711)	4.448 (1.04)
≥5 times	4.277 (0.860)	3.763 (0.569)	4.946 (1.03)

4.3 Mindfulness and self-compassion as predictors of life satisfaction

One regression analysis was conducted with life satisfaction as the dependent variable and mindfulness as the independent variable. The regression was significant ( $F_{(1,124)} = 10, 19$ ,  $p < .01$ ,  $\beta = .28$ ). A second regression was conducted with self-compassion as the independent variable. Self-compassion also predicted life satisfaction with a higher significant amount of variance than mindfulness ( $F_{(1,123)} = 17,91$ ,  $p < .001$ ,  $\beta = .38$ ). Both independent variables significantly contributed to the prediction of life satisfaction, and self-compassion was the major contributor ( $t = 4,23$ ,  $p < .001$ ), followed by the mindfulness variable ( $t = 3,19$ ,  $p < .01$ ).

5. Discussion

The present research examined the Pilates Method according to somatic education theory as a potential influence on variables that have been of interest in positive psychology research. More specifically, the study focused on mindfulness, self-compassion and life satisfaction among adults, and investigated the relationships among them.

The findings confirmed our general and specific initial hypotheses. The high scores on mindfulness, self-compassion and life satisfaction among Pilates practitioners showed a positive influence of Pilates practice. Attention was focused on the role of Pilates practice according to somatic education theory. Participants tended to show enhanced awareness of bodily sensations through traditional application principles, supporting mindfulness, self-compassion and life satisfaction, which are required for advocacy and individual change. Traditional Pilates principles of centering, concentration, control, precision, breathing, slow movement and flow appeared to show a



trend toward increased awareness of overall movement and body position in space, enhancing mindfulness, self-compassion and life satisfaction. The Pilates Method results in a tendency to use body processes and physical movement to gain psychological benefits, emotional control and wellbeing. The ultimate educational goal, according to Joseph Pilates, has been confirmed through somatic education theory. Using control, precise breathing and conscious awareness through slow physical movement, practitioners gain experience in controlling imbalances and discomfort, thereby improving psychological and mental health. According to the results, Pilates may serve as an excellent tool for making individual changes in daily life and increasing the potential for a better quality of life.

The main findings of the study also supported the hypothesis that more frequent participation in Pilates practice per week is associated with higher mindfulness, self-compassion and life satisfaction scores. The findings confirmed those of previous studies on the practice of the Pilates Method, and showed a trend in which continual participation in Pilates causes changes. Many activities and forms of physical exercise can be completed without involving the mind, such as using a treadmill at a gym. However, such external stimulation often creates a considerable disconnection with the body. Mind-body exercises, such as Pilates, use activities that focus on mental wellbeing through performing physical movements. In fact, they stress the awareness and quality of movement over quantity. In particular, Pilates strongly focuses on body placement, centering and breathing. Incorporating all these crucial facets together during Pilates practice requires concentration and focus. Thus, a certain amount of mindfulness is required. Pilates encourages practitioners to “go within,” eventually connecting with their deeper pelvic floor and abdominal muscles, thus creating an awareness of the muscles and improving exercise function and feeling. Connection with the muscles, thus making the body more aware as people gradually change their muscles with their minds. Eventually, people can move efficiently, improve their postures and correct various patterns in movement that no longer serve them.

Although mindfulness is often treated as a natural process, it is more readily available to individuals that practice it daily. Whenever awareness is directly incorporated into a person's current experience through their senses, or into their mind's state through their emotions and thoughts, they are being truly mindful. Saletnik et al. (2018) have stated that research is increasingly showing that when the brain is trained to become conscious or mindful, the entire process remodels the actual physical structure of the brain. More importantly, the primary objective of mindfulness is to “wake up” a person's inner workings, primarily their physical, emotional and mental processes. In contrast, self-compassion can be enhanced through augmenting emotional agility, practicing mindfulness and externalizing inner criticism. Pilates practice appears to help practitioners release their muscles and gain control of their deep core muscles, which are closely associated with the emotional baggage that affects self-compassion. Alderman (2020) has argued that contacting muscles that keep a person's emotional tension in check helps people let go of their emotional baggage.

Furthermore, the findings supported the hypothesis that the Pilates Method is linked to mindfulness, self-compassion and life satisfaction. Although a wealth of research has investigated the relationships among these three variables, few studies have focused on Pilates. The present work aimed to fill part of this research gap. The results were consistent with those from previous studies showing that the three factors are related and influence one another, as analyzed in the literature review. Furthermore, mindfulness and self-compassion are good predictors of life satisfaction. The practice of Pilates in this research might have affected each factor individually. Some factors may play intermediate roles, although this possibility was not considered in the present study.

In the present research, because an intervention was not performed, we attempted to limit other factors that might affect the variables in the study. A long time was required to recruit a sufficient number of participants who had practiced Pilates continually for years and were committed to this practice, without regularly participating in other physical activities or positive psychology programs. The instructors were also selected after a short interview to ensure that they did not practice Pilates simply as a fitness exercise—a very common practice in Greece and in the Western

world in general—but structured their lessons according to the basic traditional principles forming the basis of somatic theory and the mind-body approach. However, more research is needed to make the role of Pilates more transparent and understandable.

The reviewed literature and findings revealed that Pilates activities are positively correlated with factors that enhance positive psychology processes and wellbeing. Mindfulness, self-compassion and life satisfaction, according to the literature review, positively affect both mental and physical health, and consequently the overall quality of life and the sense of wellbeing. Overall, Pilates enables complete coordination among the spirit, mind and body, helping practitioners disconnect from the outside world and focus entirely on the mind and body, thus aiding in managing the busy and chaotic world. Therefore, Pilates is also a somatic and mind-body exercise or activity.

As a somatic method, the Pilates technique appears to have substantial implications in physical education and dance education. The Pilates Method allows dancers and physical education students to be creative and use multiple perspectives associated with the body and the mind for improvements in kinesthetic awareness in sports, dance or choreography, and to increase sensory motor experiences that affect learning processes. Consciousness and respect for the body and its movements are made possible by self-awareness. The above skills are essential for development and performance in physical education. Pilates helps develop discipline and create space to focus on specific aspects of the physical body, such as the breath. Students have the freedom to explore, and are permitted to make mistakes and to fail. Positive self-reinforcement can create a more supporting and nurturing environment.

Pilates, similarly to yoga (Zafeiroudi et al., 2021), embodies knowing and helps dancers develop integrity (Zafeiroudi, 2021). Dancing provides an excellent opportunity for children and adults to be physically strong, and offers a core platform for emotional expression and experiencing growth in performances. Enrolling dancers in Pilates is an excellent way to boost their vitality for physical exercises, increase their energy levels, and improve their body and self-awareness. Mindfulness and self-compassion gained through Pilates practice could increase precision and control in completing various gestures and moves, so that dancers do not injure themselves through over-extension, overstretching and overtraining. In addition, the focus on the present gives practitioners a clearer mind and the strength to cope with complex sequences, and combinations such as turns and leaps. Detachment from the everyday world to tap into the self may enhance the creative process and the expression of feelings.

Somatic and mind-body principles through Pilates can be applied to physical and dance education. Breathing, sensing and connecting can be applied in more technical combinations and learned through repetition. Students should be given the choice to explore, to enhance creativity feeling freedom from fearing mistakes. Both sequential and nonsequential movements could be explored, for example, through games based on Pilates principles. In addition, slow movement provides an opportunity to connect with the body, mind and environment, through exploring the center of the body and adjusting imbalances. Finally, by focusing the mind on sensations rather than correct techniques, every movement can be adjusted to individuals' abilities and needs.

## 6. Conclusion

This work was aimed at expanding the ways in which movement through Pilates can be considered and practiced in relation to somatic education and mind-body disciplines. Pilates practices enable practitioners to gain unique sensory motor experiences that enhance mindfulness, self-compassion and life satisfaction, thus improving their overall sense of wellbeing. The greatest value of this work is that it invited participants to enter into a different relationship with bodily movement, to see beyond the physical body, fitness and exercise techniques. Further empirical research is required to explore the value of the Pilates Method in shaping somatic experiences. Yet, on the basis of its core principles, the Pilates Method appears to be a crucial approach for developing mindfulness, although this relationship continues to be a matter of debate. In addition, an exploration of various somatic

methods and techniques in the Pilates Method that promote mind-body disciplines and wellbeing should be conducted.

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