

# Evaluation of Psychological Changes on Women Following Coordination Exercises: Immediate Effects of Life Kinetik<sup>®</sup> Implementation

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## Abstract

**Objective:** This study aimed to evaluate the immediate psychological effects of coordination exercises on women in Japan. **Methods:** The subjects were 17 adult women (height,  $160.1 \pm 5.1$  cm; weight,  $54.3 \pm 10.5$  kg; age,  $57.8 \pm 8.3$  years) living in the community and attending a fitness club. The subjects performed a coordination exercise called Life Kinetik<sup>®</sup>. The subjects responded to the Two-Dimensional Mood Scale–Short Term before and after performing 30 minutes of Life Kinetik<sup>®</sup>. The results were tabulated and four psychological states were calculated (*i.e.*, vitality, stability, pleasure, and arousal). The pre- and post-implementation results were statistically analyzed using a corresponding *t*-test. **Results:** Significant differences were found in activation and arousal levels, but not in stability and comfort levels. **Conclusion:** The coordination exercise, Life Kinetik<sup>®</sup>, was found to be an exercise program with potential psychological benefits, as it could change women's psychological condition to active and excited states.

## Keywords

Psychological State, Life Kinetik<sup>®</sup>, Mood Scale

## 1. Introduction

The number of people with mental illness in Japan has exceeded 5 million and continues to increase. When combined with the problems of a low birthrate and aging population, this issue induces the social problem of a declining working population [1]. Sick leave due to mental health problems has a high recurrence

rate, with an average 107 and 157 days for first and second absences [2]. These factors highlight the prominent issue of how to prevent psychological ill health in Japan. Following the increasing importance of work-life balance in recent years, companies have therefore been developing various working environments to enhance working styles and even provide psychological support for their employees. Nevertheless, women still bear a heavy burden in the areas of childbirth, childcare, and care throughout their lives [3]. Hence, concrete measures being taken by companies include increasing the number of women employed by clarifying recruitment guidelines, actively selecting women for management positions, and implementing training programs on inclusiveness and prejudice for current managers [4]. Even though the employment rate of women has increased as a result, there are reports that women tend to perceive life events as negative and difficult to control; hence, they are more likely to experience psychosocial distress [5]. In particular, the psychological impact is that women have twice the risk of developing mental illnesses, such as depression, compared with men [6]. In addition, women's psychological burden related to life events is very often a factor that makes it difficult for them to continue their work [3]. Thus, there are various challenges related to women workers' psychological health. Developed by the German scholar Horst Lutz, Life Kinetik® comprises various exercises aimed at improving brain function, which are applicable to a wide range of people, from children to the elderly. Specifically, in addition to multitasking and exercise programs using tools such as balls, the Life Kinetik® program is characterized by cognitive tasks and visual load. The difficulty and intensity of the exercise program can be adjusted according to the target group, making it enjoyable for everyone. Studies on athletes have reported improvements in concentration, confidence, and skills, but there have not yet been reports on its psychological benefits [7]-[9]. The majority of people who have experienced Life Kinetik® found it to be actively engaging and enjoyable; therefore, it would be worthwhile to verify its effectiveness on psychological aspects. We investigated what kind of psychological changes occur when women perform Life Kinetik® to show that the light impact of this easy-to-implement program could reduce their psychological burden. Hence, improving women employers' health will help Japanese companies confront the problem of a shrinking workforce in the near future.

## 2. Participants and Methods

The study used Repeated Measures Design to investigate psychological changes before and after the training intervention. The study randomly selected seventeen adult women (height  $160.1 \pm 5.1$  cm, weight  $54.3 \pm 10.5$  kg, age  $57.8 \pm 8.3$  years) who lived in the community and attended a fitness club. Participants with significantly painful osteoarticular disease and impaired cognitive function were excluded. The subjects performed 30 minutes of Life Kinetik® and their psychological state was assessed before and afterwards using the Two-Dimensional Mood Scale-Short Term (TDMS-ST), which consists of eight items and

measures four psychological states (*i.e.*, vitality, stability, pleasure, and arousal). The subjects were asked to respond to each of their current psychological states using a six-point Likert scale in the TDMS-ST after a thorough verbal explanation. The Life Kinetik® exercises were supervised by a certified personal trainer. Statistical analysis was conducted using SPSS software (version 28; IBM Japan, Tokyo, Japan) and the scores for vitality, stability, pleasure, and arousal calculated as a result of the TDMS-ST were analyzed with a corresponding t-test. Effect sizes were calculated for each variable using Cohen's *d*. The study was approved by the Ethics Committee of the Kanazawa Orthopedic Sports Medicine Clinic in accordance with the 2013 Declaration of Helsinki (kanazawa-OSMC-2024-002).

### 3. Result

The participants ranged in age from 40 to 70 years and were all members of fitness clubs. All participants were in good health. **Table 1** presents the results of the corresponding t-tests, where significant differences were found for vitality and arousal ( $p < 0.01$ ), but not found for stability and pleasure.

**Table 1.** Changes in TDMS-ST before and after Life Kinetik® intervention.

	Pre	Post	p-value
Vitality	4.53 ± 2.17	6.52 ± 3.85	P = 0.01*
Stability	4.41 ± 3.27	3.99 ± 3.71	P = 0.71
Arousal	0.12 ± 3.49	2.53 ± 2.52	P = 0.01*
Pleasure	8.94 ± 4.31	10.51 ± 7.31	P = 0.36

Values are presented as the mean ± standard deviation. \* $p < 0.05$ .

### 4. Discussion

In the present study, the women participants' mood was assessed using the TDMS-ST before and after implementing Life Kinetik®. On the one hand, the results showed significant differences in the arousal component and its vitality factor. On the other hand, no significant differences were found for the stability and pleasure components. This result indicates that Life Kinetik® has an immediate psychological effect and can be used as a method to change women's psychological conditions into active and excited psychological states.

In previous studies, women were twice as likely to suffer from mental illnesses, such as depression [6]; therefore, it is very important to maintain or improve their psychological health. The TDMS-ST used as the mood scale in this study consists of eight items and is very easy to assess, which makes it suitable for frequent assessment in daily life and during sports activities, in addition to reflecting psychological moods at the moment [10]. The significant increase in arousal and vitality in the present study may indicate the effectiveness of Life Kinetik® as a means of addressing the high probability of women suffering from mental ill-

ness by improving their psychological health. It is known that psychological arousal is related to heart rate variability, with low heart rate variability and a low arousal state resulting in an overactive parasympathetic nervous system and very negative psychological and physical states [11] [12]. Furthermore, depressed patients have difficulty controlling their negative emotions in response to negative information and are thought to be biased toward preferential processing of negative information [13]. The psychological effect of Life Kinetik® in this study is to increase arousal and vitality, which may lead to psychological as well as physical arousal and vitality, preventing or improving negative states in both body and mind.

Vitality is a feeling of energy within an individual [14], which is associated with their enthusiasm, sense of well-being, and positive and proactive body and mind states [15]. Studies in women have reported that low vitality is associated with persistent back pain, while women with high vitality are more likely not to be depressed. Low vitality is also more associated with physical disability and cognitive functioning than with innate personality temperament [16] [17]. This finding of associations with factors that directly affect life and work, such as pain or mental and physical disability, explains the significance of the study results in relation to the psychological and physical aspects of women's lives. In addition, increased vitality in job performance is an essential factor for reducing errors, improving performance, and as a driving force for creativity and problem solving [18]-[21]. More importantly, higher vitality is associated with the likelihood of continued employment [22]. In other words, companies' use of methods to increase vitality among their employees, such as Life Kinetik®, as part of their health management policies could provide opportunities to achieve the important factors of securing human resources and employing women in an era of declining labor force concerns.

Life Kinetik® is a complex exercise program that incorporates a variety of movements and can be performed individually or in groups. Interacting with others by throwing a ball and cooperating in a group to perform the Life Kinetik® exercises are considered to be psychologically transformative and encourage positive and active states. The increase in arousal and vitality in this study was a result of the participants' enjoyment and active engagement through the implementation of Life Kinetik® exercises. The participants were engaged in a new exercise task that they had never done before, such as using a ball, a beanbag, and a badminton racket, which they may rarely use in their daily lives. The participants were encouraged to perform the tasks correctly without making mistakes and to strive to perform better than their peers, which may have increased their vitality. This autonomy and the experience of tackling a new task successfully further increased the participants' vitality, suggesting its efficacy for psychological health. Life Kinetik® has been widely used in the field of sports as an exercise program that anyone can enjoy; therefore, it should be actively used and researched in areas related to mental health. Hence, this study contributes to

these efforts. Further detailed examination of the psychological effects identified in this study may provide measures to reduce the workers' psychological burden. In the management of companies and organizations in Japan, where the working population is threatened by declining numbers due to the aging general population, it is important to develop corporate initiatives to support workers' mental and physical health.

## 5. Limitations

A limitation of this study is that the subjects were women aged in their 40s to 60s with no significant underlying diseases. In the future, these differences should be examined according to gender and age, in addition to including men and the elderly. It is also necessary to investigate the psychological effects of Life Kinetik® on people with pain or a history of mental illness, and to verify its effects by comparing a healthy group with a group with a history of illness. In addition, as this study focused on immediate effects, the persistence of these effects and long-term changes remain unclear. Therefore, in future research, psychological states should be measured for a certain period after the implementation of Life Kinetik® and the duration of the effects should be examined. It may also be necessary to investigate whether the duration of the effect time may be sustained by conducting Life Kinetik® more than once.

## 6. Conclusion

It was found that after performing Life Kinetik®, one of the coordination exercises, the women's psychological vitality, arousal, was improved and changed to an active and excited state.

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## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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