

A NEW EDUCATIONAL PROGRAM FOR IMPROVING POSTURE AND QUALITY OF LIFE AMONG STUDENTS

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ABSTRACT. Drawing on the emergent appreciation in recent years of the positive effect of health and body movement on the *quality of life*,¹ this research examined the correlation between correct posture and educating for correct posture, and Israeli students' *quality of life*. Examination of education for correct posture was conducted in 14 classes in which subjects, following verbal instructions, performed exercises derived from both Feldenkrais and the new MAP method. These methods are suited for adolescents and adults. Correct posture was assessed by a vertebral column curvature-measurement device, and by an open-ended survey. *Quality of life* was evaluated by both open and close-ended surveys. The results indicate that *quality of life* and posture can be improved by these educational programs. Partial correlation was found between posture and *quality of life*. These findings support the understanding that there is a correlation between posture, or health in general, and *quality of life*, and therefore constitute a foundation for further studies with a focus on the design of educational programs for posture improvement.

Keywords: *Posture, quality of life, Feldenkrais, MAP*

ZUSAMMENFASSUNG. Ausgehend von der aufstrebenden Aufwertung von der positiven Wirkung der Gesundheit und der Körperbewegung auf die Qualität des Lebens, in den letzten Jahren, diese Forschung untersucht die Korrelation zwischen korrekter Haltung und Erziehung für richtige Körperhaltung und israelischen Studenten Lebensqualität. Untersuchung der Bildung für richtige Körperhaltung wurde in 14 Klassen durchgeführt, in denen die Teilnehmer, nach verbalen Anweisungen, abgeleitete von Feldenkrais und der neuen MAP-

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¹ Pereira, Ligia M. et al., "Comparing the Pilates Method with No Exercise or Lumbar Stabilization for Pain and Functionality in Patients with Chronic Low Back Pain: Systematic Review and Meta-Analysis," *Clinical Rehabilitation*, 26 no. 1 (2011); Maher, G., "Effective Physical Treatment for Chronic Low Back Pain," *OrthopClin North Am*, 35 (2004).

Methode Übungen durchgeführten. Diese Methoden sind für Jugendliche und Erwachsene geeignet. Die richtige Körperhaltung wurde von einer Wirbelsäule Biegung-Messgerät und durch offene Erhebungen beurteilt. Die Lebensqualität wurde durch beide geöffnet und geschlossen Umfragen ausgewertet. Die Ergebnisse zeigen, dass die Lebens- und Haltungqualität von pädagogischen Programmen verbessert werden kann. Teilweise Korrelation wurde zwischen Körperhaltung und Lebensqualität gefunden. Diese Ergebnisse unterstützen das Verständnis, dass es eine Korrelation zwischen Körperhaltung oder Gesundheit allgemein und die Qualität des Lebens gibt und bilden daher die Grundlage für weitere Studien mit einem Schwerpunkt auf der Gestaltung von Bildungsprogrammen für die Körperhaltung Verbesserung.

Schlüsselwörter: Haltung, Lebensqualität, Feldenkrais, MAP

1. Background

Man's pursuit for the meaning of *quality of life* is as ancient as Aristotle's adage on human goodness and Maimonides's proverbial "A healthy mind in a healthy body."² Today we can determine that *quality of life* is the subjective feeling at any given moment based on the perception of all aspects—health, professional, marital, social, economic etc—of the individual's life, in relation to the society of which he or her are part, and to his or her past and projected future.³ It is commonly accepted that in order to preserve *quality of life* one needs to maintain a healthy body,⁴ of which one of the parameters is the preservation of correct posture.⁵ By maintaining the body's proper pose, without overloading the joints and while using the relevant muscles correctly, one can prevent skeletal, muscular, cardio-vascular and neurological problems, reduce medical expenses and monetary loss due to absence from the workplace, and prevent emotional distress related to concerns such as self image.⁶

While Bandura⁷ and Seligman⁸ have noted that *quality of life* is commonly used to describe one's life in a particular situation while referring to various

² Levene, L., *Know More. The Great Philosophers* (Tel Aviv: Agam Publishing Ltd., 2011).

³ Bandura, A., "A Social Cognitive perspective on Positive Psychology," *Revista de Psicología Social* 26, no. 1 (2011); Seligman, M., "Positive Health," *Applied Psychology* 57, no. 1 (2008).

⁴ O'Boyle, C.A., H. McGee and C.R.B. Joyce, "Quality of Life: Assessing the Individual," *Advances in Medical Sociology*, 5 (1994).

⁵ Lmiolek, M., "Spine Mobility and the Quality of Body Posture in 11-Years Old Handball Players Compared to Their Peers," *Medsportpres*, 5 (6) no. 24 (2008).

⁶ Marshall, M., A.C. Harrington and J.R Steele, "Effect of Work Station Design on Sitting Posture in Young Children," *Ergonomics*, 38 (1995).

⁷ Bandura, A., "A Social Cognitive perspective on Positive Psychology," *Revista de Psicología Social* 26, no. 1 (2011).

⁸ Seligman, M., "Positive Health," *Applied Psychology* 57, no. 1 (2008).

factors such as age, family status, political status, health etc, Feldenkrais stresses unity between the mental and the physical, i.e. emotional, intellectual, sensory and motile, states of being as conducive to high *quality of life*. Of these, Feldenkrais stressed motility as that which, by altering the other states, determines one's measure of *quality of life*.

To create this balance, Feldenkrais formulated an innovative educational method based on philosophical and practical-physical approaches.⁹ To his method, improving and perfecting motility results in posture improvement, both in static situations such as sitting and standing, and in dynamic situations, such as walking and running. Improvement and perfection of these abilities are contingent on neural and behavioral changes that occur while exercising in accordance with unique techniques.

Other, more conventional methods for posture improvement are based on the strengthening of certain muscles.¹⁰ Accordingly, control over the pelvic floor provides the basis for organizing posture, which in turn, improves functional abilities, links body and mind, and leads to the improvement of *quality of life*.

To unify the advantages of the Feldenkrais method with more conventional methods we conceived the Motion and Posture (MAP) method. To test this method, we chose Feldenkrais classes in which posture muscles (abdominal, pelvic and back) are strengthened.

Subjects were instructed to perform: 1. Strengthening those muscles by regular Feldenkrais exercise; 2. Selecting Feldenkrais classes that work the muscles merely by positioning the body in sitting position, walking on all fours or standing on two.

The literature shows that employment of the Feldenkrais method improves *quality of life*. Yet there is no evidence as to a linkage between implementation of the Feldenkrais method, or any other aforementioned method, and posture improvement. The primary goal of this study was to examine the nature of the connection between body posture and *quality of life* while focusing on two key issues:

1. Whether and in what manner does practicing the Feldenkrais method improve *quality of life* and body posture?
2. Whether and in what manner does practicing the MAP method improve *quality of life* and body posture?

Thus, the research hypotheses were:

⁹ Feldenkrais, M. *Practical Ability Improvement* (Tel Aviv: The Feldenkrais Institute, 1967).

¹⁰ Sarig, Y. *A Collection of Lectures*. The National Training Center for Bone Building. Tel Aviv, Israel, 2002.

Hypothesis 1. Combined employment of the MAP and Feldenkrais programs will improve *quality of life*—in the overall sense of wellbeing, in terms of the physical condition of the back, and in both emotional and financial terms.

Hypothesis 2. The general posture and spinal column curvature angles (e.g. Kyphosis and Lordosis) will improve through employment of both MAP and Feldenkrais programs.

Hypothesis 3. The correlation between improved posture and improved *quality of life* will be positive.

Hypothesis 4. Findings will differ between the two research groups.

2. Methodology

2.1. The Research Approach

Due to the fact that the research involves professional practice, and that some of its goals are to examine, develop and promote the researcher's fields of interest, a pragmatic paradigm was found most suitable. Accordingly, an integrative methodology combining both quantitative and qualitative approaches and tools was selected. The quantitative research consisted of an experimental part and the qualitative kind emphasized action research.¹¹

2.2. The Research Population

The research population included 243 students, aged 18-28, from the "Technion. Israel Institute of Technology." 70% of the students were female. The students were examined during the course of their academic studies. Considerations for selection were: subjects aged 20-30 are mature enough to understand instructions for the practice and application of methods in and outside the classroom; subjects are young enough to show a significant effect of the intervention program on both their physical status and *quality of life*.

2.3. Research Tools

2.3.1. The quantitative research tool

In order to ascertain the connection between the program and improvement of physical status and *quality of life*, all subjects were measured at two points in time—at the beginning and at the end of the semester. A small group of students (N=79, 32.5%) were also measured in the middle of the semester.

¹¹ Bocoş, M., *The Theory and Praxis of Pedagogical Research* [Teoria și practica cercetării pedagogice] (Cluj-Napoca: Editura Casa Cărții de Știință, 2007); Bryman, A., *Mixed Methods*. 4 Volumes (London: Sage, 2006); Creswell, J.W., *Research Design*. 3rd ed. (Lincoln, Nebraska: University of Nebraska Press, 2009).

The Measures

Quality of life survey (SrS-22)-Primary tool for checking the *quality of life*. This survey included 22 items related to back and spine health and its effect on *quality of life*.

Digital Inclinator-The spinal column was measured by two sub-measures during each measuring point: (a) Kyphosis was measured in upper (C7) and lower (T12) points. An absolute gap was calculated between these points. (b) Lordosis was measured in upper (T12) and lower (L5) points followed by the calculation of an absolute gap between these points.

2.3.2. *The qualitative research tool:*

“Class Effect” Survey-This open-ended survey was designed specifically for this study and contained five open-ended questions pertaining to the processes and effects of the research program. The questions were related to both theoretical learning procedures (understanding the learned material) and practical learning procedures (changes in movement and movement habits). The questions prompted the subjects to share emotional and experiential dimensions. The main goal of the survey was to address the need, raised in the qualitative data gathering, for the subjects’ description of processes experienced in the immediate time period after the exercise class and throughout the entire program¹².

2.4. Stages of the Research

Table 1: Stages of the Research

Stage	Goal	Research Question	Research Tool	Analysis Method
1 Early March 2012	To examine subjects' position regarding <i>quality of life</i>	What are the subject's position regarding <i>quality of life</i> prior to the intervention program?	<i>quality of life</i> questionnaire (SrS-22)	quantitative statistics
2 Early March 2012	To examine the vertebral column arches in the upper and lower back	What are the physiological data of the subjects prior to the intervention program?	Digital Inclinator	quantitative statistics
3 March-June 2011/2012	Implementing the study itself	Could body posture improve by practicing the Feldenkrais method and the MAP method?	Intervention programs	
4 March-June 2012	To examine the effect of a single class on the vertebral column arches	Could body posture improve by practicing the Feldenkrais method and the MAP method, even at a single lesson?	Digital Inclinator	quantitative statistics

¹² Shkedi, A., *Words of Meaning* (Tel Aviv: Ramot, 2007).

Stage	Goal	Research Question	Research Tool	Analysis Method
5 March-June 2012	To examine the development procedures those are affected by the programs.	Is there and what are the implications of the intervention program on the lives of the subjects in the immediate term after classes and as a cumulative effect.	“Class Effect” questionnaire	qualitative content analysis
6 June 2012	To examine subjects' position regarding <i>quality of life</i>	What are the subject's position regarding <i>quality of life</i> after the intervention program?	<i>quality of life</i> questionnaire (SrS-22)	quantitative statistics
7 June 2012	To examine the vertebral column arches in the upper and lower back	What are the physiological data of the subjects after the intervention program?	Usage of a Inclinometer device	quantitative Statistics

2.5. Data analysis

Quantitative-Analysis of Variance with repeated measures was conducted in order to test the difference between the initial status of the subjects before the intervention program and their status at the end of the program. The Pearson test was applied to test the connection between variables.

Qualitative-The qualitative analysis was employed to further prove the validity of the theory and the educational program presented in the study, thereby strengthening the qualitative findings. Moreover, it is possible that the qualitative findings will indicate a correlation between posture improvement programs and the enhancement of the *quality of life*.

3. Findings

3.1. Findings emerging from the quantitative data

Hypothesis 1: Combined employment of the MAP and Feldenkrais programs will improve *quality of life*—in the overall sense of wellbeing, in terms of the physical condition of the back, and in both emotional and financial terms.

Findings emerging from analysis of the *quality of life* survey (SrS-22) results: The independent variable in this analysis was “group type” (Feldenkrais vs. MAP) and the dependent variable was *quality of life*. First, general improvement of *quality of life* was examined, followed by the examination of improvements in each of the sub-domains of *quality of life*.

Results show a significant improvement in the general *quality of life* among subjects in both groups between pre-intervention (M=3.57, SD=0.43) and post-intervention (M=3.66, SD=0.48) ($F(1,137)=13.819$, $p<0.001$, $\mu^2=0.092$). General *quality of life* of both groups improved significantly after intervention.

Table 2: Means and standard deviations of general *quality of life* and sub domains of *quality of life* among the groups

Measure	Pre intervention		Post intervention	
	Feldenkrais (N=39)	MAP (N=100)	Feldenkrais (N=39)	MAP (N=100)
General quality of life	3.63 (0.41)	3.54 (0.44)	3.69 (0.46)	3.65 (0.49)
Back Condition	3.75 (0.74)	3.83 (0.77)	3.90 (0.76)	3.97 (0.71)
Emotional Condition	3.64 (0.47)	3.54 (0.48)	3.83 (0.49)	3.79 (0.57)
Physical Condition	3.87 (0.57)	3.85 (0.53)	3.89 (0.55)	3.89 (0.53)
Financial Condition	1.31 (0.98)	1.10 (0.48)	1.23 (0.91)	1.34 (1.04)

Hypothesis 2: The general posture and spinal column curvature angles (e.g. Kyphosis and Lordosis) will improve through employment of both MAP program and Feldenkrais programs.

Findings emerging from analysis of the Digital Inclinator results: The independent variable in this analysis was “group type” (Feldenkrais vs. MAP) and the dependent variables were absolute gaps of Kyphosis and Lordosis between pre-intervention and post-intervention.

Table 3: Means and standard deviations of Kyphosis and Lordosis gaps between pre intervention and post intervention by groups

Measure	Pre intervention		Post intervention	
	Feldenkrais (N=69)	MAP (N=54)	Feldenkrais (N=69)	MAP (N=54)
Kyphosis gap	20.55 (7.87)	14.66 (7.18)	16.36 (7.11)	15.76 (8.29)
Lordosis gap	9.35 (8.40)	18.98 (8.26)	6.97 (4.89)	12.18 (7.84)

Results show that the Kyphosis gap did not change among subjects of both groups between pre-intervention (M=17.96, SD=8.10) and post-intervention (M=16.09, SD=7.62) ($F(1,121)=2.395$, $p=0.124$, $\mu^2=0.019$). Nevertheless, a significant interaction was found between group type and difference in Kyphosis gaps ($F(1,121)=6.997$, $p<0.01$, $\mu^2=0.055$). While no difference was found in the Kyphosis gap among subjects MAP, the Kyphosis gap decreases among subjects at Feldenkrais.

Results showed that among subjects of both groups Lordosis had decreased between pre-intervention (M=13.60, SD=9.59) and post-intervention (M=9.27, SD=6.85) ($F(1,118)=27.293$, $p<0.001$, $\mu^2=0.188$). In addition, a significant interaction was found between group type and difference in Lordosis gaps ($F(1,118)=6.323$, $p<0.05$, $\mu^2=0.051$).

Hypothesis 3: The correlation between improved posture and improved *quality of life* will be positive.

In order to examine this hypothesis, Pearson correlations were produced between improvement in Kyphosis/Lordosis and *quality of life* measures as presented in Table 4.

Table 4: Correlations between Kyphosis/Lordosis and *quality of life*

	General QOL	Back Condition	Emotional Condition	Physical condition	Financial condition
Kyphosis Gap	-.009	.080	.045	.004	.045
Lordosis Gap	.129	.066	.123	.137	-.036

As seen in Table 4, no significant correlations were found between improvement in Kyphosis or Lordosis and *quality of life* measures in the general sample.

Hypothesis 4: Findings not evident.

3.2. Qualitative Findings emerging from the Research

This section presents the data obtained from the content analysis of surveys conducted in the current study. The qualitative data were gathered by the “Class Effect” survey. A total of 30 surveys were gathered from 17 students. 22 surveys were answered by students from the Feldenkrais group and 8 by students from the MAP group.

The first hypothesis of the study was that the Feldenkrais and MAP educational programs will affect and improve the subjects’ *quality of life*. According to Feldenkrais, good *quality of life* is conducive to the unity between emotion, sensation, thought and movement. Answers in the “Class Effect” surveys included multiple positive statements relating to the four components of *quality of life*. Some examples are: “more balanced,” “walking more upright,” “change in the general feeling,” and “improved self-confidence.” These statements are indicative of improvement in the *quality of life* experienced by subjects as a result of the correct posture educational programs, and therefore confirm the first hypothesis.

The second hypothesis, which examined whether these educational programs will improve the subjects’ posture, was also confirmed by analysis of the “Class Effect” survey. Typical participant answers point to improvement in their posture: “prolonged sitting with the back in upright position,” “balance between the knees,” “less flat-feet,” etc. Notably, most of the statements referred to the subjects’ typical, static position, i.e. sitting, and less to dynamic situations such as walking or running.

In contrast to the findings of the quantitative research, the qualitative analysis confirms the third hypothesis, i.e. a positive correlation between improvements in posture and *quality of life*. The subjects' answers show development in their understanding and perception of the methods' effects. Their initial references were mainly to the positive effects of a single class. Their statements throughout the survey and during the study itself referred to the program's overall positive physical and mental effects on their lives. It can, therefore, be concluded that there is a positive correlation between the two variables.

Based on the quantitative research, there were no differences found between the research groups. Thus the fourth hypothesis was not confirmed.

4. Discussion

The main research goal was to examine the connection between body posture and *quality of life*, from which two subsequent goals were derived: to detect a positive correlation between an educational program for correct posture and *quality of life*; and to locate a positive correlation between the said program and posture improvement. The educational program was implemented in two groups of subjects, while each group was instructed for movement and correct posture habits according to a different method. The first, in compliance with the established Feldenkrais method (improving motility and posture while creating changes in the *quality of life* components, i.e. movement, feeling, sensation and thought), and the second in accordance with the new MAP method (combining muscle strengthening while exercising the Feldenkrais method) developed by the author of the study. As differences were not found between the research groups, the following will refer to subjects as one group.

Drawing on the research literature,¹³ for the purpose of this study *quality of life* was defined as the subject's current subjective feeling, based on perception of his or her physical and mental state vis-à-vis posture examined in terms of upper curvature (Kyphosis) and lower curvature (Lordosis). Accordingly, the following question arised: What accounts for improvements in the state of the subjects' backs as indicated in their verbal reports?

The back is the center of the body and relatively large in relation to other organs. It comprises multiple bones, joints, nerves, blood vessels and muscles. The back erectors are muscles at both sides of the vertebral column and sustain its

¹³ Bandura, A., "A Social Cognitive perspective on Positive Psychology," *Revista de Psicología Social* 26, no. 1 (2011); Seligman, M., "Positive Health," *Applied Psychology* 57, no. 1 (2008); Feldenkrais, M., *Practical Ability Improvement* (Tel Aviv: The Feldenkrais Institute, 1967).

upright position. These muscles provide support for the back and are significantly taxed when one pushes or pulls heavy loads, bends forward, arches the back or holds the vertebral column extremely straight.

In terms of motility, the back provides a variety of possible movements for different directions. This variety enables one to be resourceful when needed. From the perspective of quality of body posture, the spinal route is vital for correct posture, as it constitutes an intersection for all the muscular and neural connections and functions that connect and balance distant body parts. One can look at the back as a barometer that reflects one's emotional/mental state: is one standing straight or bent? Does it cause suffering and in turn require unnecessary expenditure of time and resources?¹⁴

As the human, natural inclination is to avoid back pain, one should be more aware of how the back is and should be used. Healing the back is like unraveling a ball of knotted twine. One should observe body movements carefully and patiently to locate the places most prone to self-inflicted harm.

In the methods presented in this study, we delineated ways to clear blockages obstructing paths toward smooth movement. We encouraged the rest of the body parts to operate and collaborate in new and in various manners. We reminded the body of what it can accomplish. Thus we eliminated the burden of over stimulation of the back while urging it to function in new and unfamiliar ways. This process is analogous to a journey for self-discovery in which one develops the ability to identify the subtle distinctions necessary for the determination of a desired course of action at any given moment.

To date (and to the best of my knowledge) correlations between posture status and emotional states are lacking in the scientific literature. Still, this does not indicate that such correlations do not exist. On the contrary, evidence presented in this study clearly shows a correlation between in subjects' sense of well-being and participation in the research underscores (correlations stress by Feldenkrais), though one should note that only several subjects referred to the emotional aspect.

Feldenkrais¹⁵ expends its treatment to difficulties that may arise in expressing feelings. Contending that physical aspects are easier to control and more disposed to intervention as a means to improvement, perfection and control, Feldenkrais opines that after these are achieved emotional facets, which are harder to control and intervene with, will be rehabilitated and renewed. This is evident in subjects' positive statements such as "the back pains lessened" and "the classes really helped me."

¹⁴ Alon, R., *Back to Natural Movement in Feldenkrais Method* (Jerusalem: Honest, 1994).

¹⁵ Feldenkrais, M., *Practical Ability Improvement* (Tel Aviv: The Feldenkrais Institute, 1967).

How did this process occur? During the research program subjects were exposed to a wide variety of movement options and had the freedom to choose that which they found most appropriate based on their own personal experiences. The subjects experienced activation of all body parts as a single cohesive and coordinated, mutually supportive unit thereby tapping its resourcefulness and refining its adaption and maneuvering skills. Subjects were encouraged to aspire for the harmonization of their movements. They acquired the wisdom to elude different situations and draw conclusions as to the necessary actions required to organize the complex parts of the organism.

During this physical process the subjects discovered the grace and pleasure derived from light and easeful movements, regained a sense of optimism and resilience, and healed their sense of physical self worth by way of which they could aspire for better *quality of life*.

This process, which provides verbal explanations and guidance for movement processes (thereby generating, within the re-education process, an improvement in everyday functions and inner resilience), encourages one to invoke an inner sense that is often more inhibited than not. This inner sense can locate and determine how to use one's body in the most beneficial way, while singling out potential harm and ways to avoid it. Due to the movement processes executed in this study's intervention program, one's ability for self-treatment improves and is manifest in the way in which the body expresses itself. This constitutes the improvement in one's personal *quality of life*. Notably, the ability for self-treatment is what others recognize most as a benefit of the overall process.¹⁶

5. Conclusions

As the research hypothesis predicted, the research found a positive correlation between the two main examined parameters: 1. Evaluation of the subjects' *quality of life* before the correct posture educational program, and at the end of the program; 2. Measurements of the subjects' vertebral column curvatures, i.e. their posture, before and after the program. Positive correlation was found between the improvement of *quality of life* and the improvement of the subjects' posture according to the qualitative research tool, and was not found according to the quantitative research tool.

This study is unique due to its introduction of an innovative educational program for improving posture (MAP) as well as its examination of the correlation between posture and the Feldenkrais method. This research offers a theoretical

¹⁶ Alon, R., *Back to Natural Movement in Feldenkrais Method* (Jerusalem: Honest, 1994).

basis for understanding the significance of correct posture in health and *quality of life*, while providing new guidelines for relevant practical exercise and guidance for adolescents and adults. As such it constitutes a point of departure for additional studies and professional development in the field.

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