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The Effect of Core Muscle Intervention Program on Improving Quality of Life in Older Adults through a Lifelong Learning Approach

PhD THESIS ABSTRACT

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INRTODUCTION

The ageing population and increase in life expectancy have become a widespread global phenomenon. The percentage of elderly people (over 65) in the global population is expected to rise from 7% in 2000 to 61% in 2030 (Center for Disease Control and Prevention, 2012). With the longer life expectancy comes the obligation to provide response for the needs of third and fourth age people (third age 65-84, fourth age 85 plus) in order to improve their quality of life and develop intervention programs that treat the social, emotional and physical aspects (Bar-Netzer & Bocos, 2018).

The ageing process involves a gradual decline in mental, physical and social abilities as well as cognition.

In this study, a new intervention program was developed by the researcher, based on psycho-education and strengthening of core muscles in order to promote quality of life, self-efficacy and everyday functional physical capability in third and fourth age adults' life.

The study examines the FORCE intervention program in Israel and is a large-scale, community-based health promotion program to encourage older adults to exercise more, extend their social cycle and improve their quality of life.

The program is based on two theoretical models: **The Whole Person Wellness Model (Kang & Russ, 2009) and the Trans Theoretical Model** (TTM) (Prochaska, et al., 1983; 2008).

Gap in Knowledge

1. There are not enough studies that examine educational programs for the third and fourth age, which combine psycho-education with the physical dimensions
2. The current study examines the effect of FORCE program on improving Quality of Life among older adults.

The Research Aims

1. To develop an intervention program (FORCE), based on core muscle strengthening and social activity, which may contribute to the quality of life and self- efficacy of the third and fourth age adults.
2. To examine the contribution of FORCE intervention program on quality of life, self-efficacy and everyday functional physical capabilities for older adults.

CHAPTER I:
OLDER ADULT EDUCATION IN THE 3RD AND 4TH AGE AND ITS CHALLENGES TODAY: THEORETICAL, POLITICAL AND LEGISLATIVE FRAMEWORK

This chapter deals with factors that influence third and fourth age adults in the present period. Due to the increased life expectancy the following theoretical and scientific issue arises – how can one maintain quality of life at an older age?

Although a person's biography does influence their ageing process, many studies in gerontology have shown that it is possible to use appropriate interventions to change and enhance the course of ageing for the better, since it is not pre-determined. Many scientific studies have shown the positive effect of educational interventions on ageing (Barveman, Egerter & Williams, 2011; Coberley, Rula & Pope, 2011; Peel, McClure & Bartlet, 2005).

It is possible to target interventions that may cause successful ageing at the context in which a person lives, including income, health, education, housing, health care, or individual behavior as well as social activities and health habits (Motel-Klingebiel, Kondratowicz &Tesch-Romer, 2005; Barnes, 2011). The FORCE program developed by the researcher in the current study for third and fourth age older adults, was based on the principles of adult learning, lifelong learning and psycho-education, specified in this chapter.

I.1 Adult Education – Andragogy

Learning among adults was named Andragogy by Knowles (1980) who wanted to change the way in which the forbearers of education approached adult learners. Knowles made four assumptions pertaining to adult learners:

(1) Self-concept is the way people perceive themselves as losing proximity from a dependent to a self-directed personality; (2) Since learners at a later age have previous learning experience that is brought into the learning environment, their capacity for learning is enhanced; (3) Adult learners are willing to learn and to develop a sense of their role in society; (4) Older people learn better through things they do, an emphasis on problems instead of subjects.
Older and more mature people have an internal motivation to study Adult learners are equipped with a broad set of skills, complex biography, larger vocabulary and a desire to learn that comes from within (Knowles, 1984). Therefore, their teachers have to generate an environment that helps develop collaborative learners (Stevens-Long, et al., 2012, Driscoll, 2005).

I.2 Aspects Involved in the Adult Learning Process

The relevant learning is influenced by the person’s present situation, past skills, accumulated experience and faith. When approaching any new knowledge, a learner’s state may reflect their current sense of competence and view of the need to learn. Vygotsky (1978) emphasizes the learning environment, placing the teacher as the key figure that creates the atmosphere and connects the subject matter with the learners. This is compatible with the term Team Based Learning (TBL) that enhances collaboration in action (Hrynchak & Batty, 2012).

The format used in TBL takes into consideration various outcomes that do not arise in lectures and facilitates collaborative learning by providing social support (Birmingham & McCord, 2004). The learning environment generated in TBL, is based on the idea of positive and educational experience. Joint actions provide communal backing that is able to negate the

loneliness often felt by older adults experience and that companionship during activities improves physical activity among older adults (Layne, et al., 2008; McAuley, 1993; 2000; 2003; 2006; Strand, 2012; Shores, et al., 2009).

I.3 Life-Long Learning (LLL) in Older Adults

Lifelong Learning literally refers to the fact that learning is part of the entire cycle of life, from babyhood to old age (Laal, 2012). This concept has been influenced by various ideologies and contexts including economic, cultural, educational, social and political.

LLL is not only made up of formal and non-formal learning but also includes informal learning (Od-Cohen & Shacham, 2016).

Due to the welfare state and social thinking in social sciences that existed in the latter half of the twentieth century, the concept of lifelong education gained popularity. There was a shift in emphasis based on a new liberal worldwide concept (Barros, 2012). Adult educators must be aware that lifelong learning is among the basic components of transformative learning. As educators gain greater awareness of their learners and the environment in which they reside, they are more capable of giving a more appropriate mix of assistance and challenge that can enhance their transformation (Panitsides &Talbot, 2016).

I.4 Psycho-education (a Holistic Learning Approach) – Theory and Practical Tools

Psycho-education, a holistic-meaningful learning approach, is an activity that takes place on the intra-personal and inter-personal level. Psycho-education is founded on the merger between the cognitive and effective elements and the synergy between intrinsic and extrinsic elements. (Feldman, 1996). However, in the course of the FORCE program there are peak moments that allow the elderly persons to understand they have generated an experience that requires them to improve their lifestyle based on the overall combination of emotional, social, cognitive and physical aspects.

According to Weinstock (2014) the influence on the learner may create change in several manners: (A) Improve or change cognitive thinking and comprehension forms through effective deepening and assimilation; (B) Requires the learners to undergo reflective learning; (C) When learning is performed by action and creation it becomes meaningful and effective to the learner. Learner feels they are applying the studied material and generates psycho-education learning adapted to their capabilities (Perkins, 1999).

Feuerstein & Feuerstein (1993) claim that the teacher's role is to find the connection between the content and the learners and thus challenge them, emphasizing the meaning of the subject matter with relation to their lives, generating excitement and yearning. In this way holistic learning is formed.

Harpaz (2008, 2010) mention the importance of involvement and choice for generating internal motivation, while Asor (2005) also notes the learner's autonomy and cooperation in selecting subject matter and learning methods.

In recent years the need for using psycho-education methods has become more vital (Colom, et al., 2003; Budner, 2015; Kok & Reynolds, 2017; Wardle, 2003). Through psycho-education practice, cognitive and emotional flexibility can be channeled, allowing for the absence of judgmental feelings and thoughts, which brings mental well-being and physical health (Malinowski, 2013).

CHAPTER II:
QUALITY OF LIFE (QOL), WELL-BEING AND SELF-EFFICACY- MULTIDIMENSIONAL AND INTERLINKED CONCEPTS

This chapter deals with the quality of life and well-being of older adults and the factors that form and influence them.

Quality of Life (QOL) is an extended notion with multiple facts that generally contains subjective assessments of the negative and positive features of life.

UNECE (2012) notes there are two separate traditions here: concepts that define quality of life using subjective assessment compared to concepts in which quality of life is objectively defined in the form of living conditions (Noll, 2000, 2010; Veenhoven, 2005).

Therefore, in this study, "active ageing" is considered the process that leads to subjective and objective quality of life at an older age with regard to social integration, participation and health.

II.1 Social Production Function Theory (SPF) and the Physical and Social Management of Overall Well-Being

The concept of well-being is wide and consists of both social and physical aspects. One of the ways of obtaining social well-being is by gaining status (social ranking based on lifestyle, occupation and talent), behavioral confirmation (a person who upholds his/her own norms or those of significant others) and affection (emotional support, intimacy and friendship from one's relatives, partner or children). In order to achieve the ultimate goal, subjective overall well-being (optimal mental well-being or quality of life) one needs to achieve physical and social well-being (Nieboer, 2015). Using the Social Production Function (SPF) theory generated a reliable and valid instrument that assesses all five instrumental goals (behavioral confirmation, status, stimulation, affection, comfort) required to reach well-being.

Figure No. II.1 sums up the hierarchy of well-being, according to Social Production Function Theory (SPF).

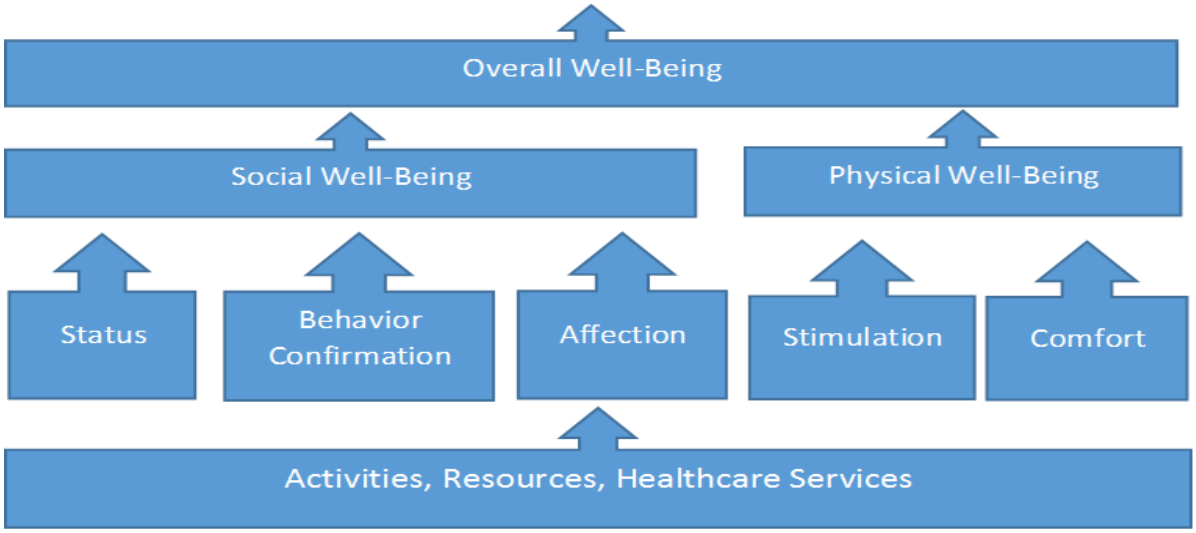

Figure No. II.1: *The Hierarchy of Well-Being- According to Social Production Function Theory (Cramm & Nieboer, 2016)*

II.2 Active Ageing (AA)

UNECE (2012) definitions of AA are described by various concepts in the field of gerontology. Among the first to use a similar term – successful ageing – it was described as based on three major factors: living life to its fullest, good bodily and psychological practical competence capability and low incidence of disease and disability relating to disease (Rowe & Kahn, 1997; Rowe & Kahn, 1987).

The two aspects of ageing that include enhancement of certain factors including wisdom, experience or joy, and simultaneously other aspects decline, including cognitive, bodily and sensory capabilities, leads to the idea of Active Ageing.

According to the Organization for Economic Cooperation and Development (OECD), Active Ageing (AA) is the ability to lead a productive life within society (OECD, 2000) The World Health Organization's definition of AA is engagement in promoting opportunities for health, participation and security that lead to improved quality of life among the elderly (WHO, 2002; 2011).

The WHO active ageing framework considered human rights and fair chances in an effective way that includes involvement and emphasized that people with needs are not negative (WHO, 2002). It also supports inter-generational solidarity (Fernandz-Mayoralas et al., 2015).

Figure No. II.2 sums up determinants of Active Ageing

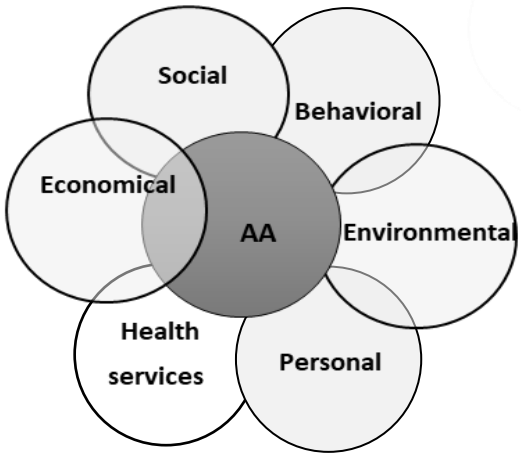

Figure No. II.2: *Determinants of Active Ageing*

II.3 Self-Efficacy and the Adult Learner

The manner in which human beings regard their competence to execute certain assignments is called self-efficacy. The definition of self-efficacy is assessment people make of their ability to devise and carry out directions of action that are needed to realize particular modes of execution (Bandura, 1986). All behavioral changes are based on the self-efficacy concept.

Self-efficacy along with learning skills and strategies, belief in one's ability and feedback increase the level of motivation, leading to improvement in the learner's achievements (Schunk, 1984C).

There are four factors that influence the sense of self-efficiency: Experience in completion of tasks, Observing others' behavior, Verbal persuasion and Emotional arousal.

Figure No. II.3 sum up components and contents of self-efficacy

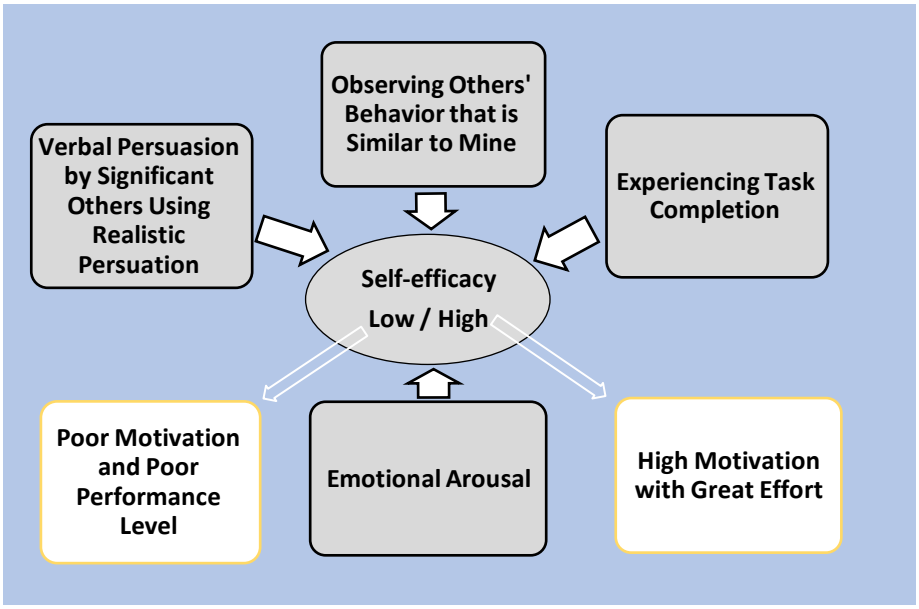

Figure No. II.3. *Learning Process by Mimicking a Model in Stages*

II.4 Performance-Enhancing Motivation

Self-efficacy and autonomous motivation go hand in hand.

Self-Determination Theory (SDT), entailing autonomous and controlled motivation, focuses on the effects of autonomous motivation compared to controlled (extrinsic) motivation and is among the more important socio-cognitive theories that deal with motivation in education. There are two key types of motivation that drive autonomous learning among students: intrinsic and internalized motivation (that includes identified and integrated regulation) (Deci & Ryan, 2008; Lens, Vansteenkiste & Matos, 2009). The SDT (Self-Determination Theory) proponents claim that high quality motivation may lead to improved learning outcome than high quantity motivation (high autonomous and high controlled), and this is a controversial point (Deci & Ryan, 2008).

CHAPTER III:
THE CONNECTION BETWEEN QUALITY OF LIFE AND PHYSICAL ACTIVITY

This chapter deals with the influence of physical activity on quality of life among the older population.

III. 1 Properties of the Physical and Cognitive Changes in the Third and Fourth Age

The section below presents physical and cognitive changes that influence health in the third and fourth age and the connection between them.

The normal rate of exercise among the elderly population is not high due to: poor motor activities, hypertrophy, declining level of energy, Sarcopenia, morphological and neurological transformation, chronic illnesses. At an older age, speed and muscular power deteriorate, as do flexibility and extent of action. The wellness of older adults is quite complicated, as shown by epidemiological research that took place in previous years.

Many studies support the claim that good nutrition and physical exercise enhance personal lifestyle and physical health (Ferrucci et al., 1999; UNECE, 2012).

Changes in physiological function affect the independence of older adults and determine their health status. Physiological changes lead to increase BMI, body aches, polypharmacy etc., indicate morbidity and a decline in everyday physical activity, which ultimately causes falls (Garber, et al., 2010).

Fear of falling is described as continuous worry of losing one's balance that leads to an individual avoiding activities that he/she remains capable of performing (Tinetti, 1993). Fear of falling leads to further falls, hesitation in performance of regular activities to the point of avoidance, depression, decline in social activities, reduced quality of life and loss of independence (Delbaere, 2010; Legters, 2002).

Ageing of the brain constitutes the key risk factor relating to neural degeneration and cognitive decline. The changes that neuro-trophic factors undergo may shed light on structural, functional and metabolic brain process throughout one's life and influence vulnerability to neurodegenerative and neurodevelopmental diseases.

One of the components that plays a part in cognitive and automatic motor skill performance is basal ganglia. Additionally, basal ganglia and its cortical connections contribute to procedural motor learning that includes acquisition and retention of automaticity (Redgrave, et al., 2010; Ashby, et al., 2010).

The benefit derived from exercise and in particular exercise that includes aerobics is most probably enhanced neuroplasticity and improved motor learning. These benefits could derive from improved vascular circulation and modification in the environment of the brain that help restore physiological and structural function.

III.2 The Connection between Physical Activity and Quality of Life in the Third and Fourth Age

This chapter discusses social and emotional learning combined with physical activity as a factor that influences quality of life among third and fourth age adults.

Social and Emotional Learning (SEL) and its Connection to Elderly Lifestyle

Lifestyle is defined according to various criteria such as socioeconomic status, nutrients, illness and sports. There is a strong link between two critical issues: emotional and bodily situations. The differences between mentality and physicality are weak and they influence one another (Ryff & Singer, 2000). The key tenets of Social and Emotional Learning (SEL) include self-awareness to the point the person may perform emotion identification and thereby effectively connect emotions to behavior. It further includes the ability to self-manage, motivate, control, and regulate emotions. Another aspect is development of social awareness that embraces diversity, empathy, and societal justice. SEL also includes the relationship skills that enhance problem-based learning, conflict resolution, and the building of relationships; and finally the capacity to make reasonable decisions by considering the wellbeing of others and of oneself and the inclination for civil debate (Edutopia, 2016).

Applying Social Integration to Physical Activity

Another aspect emphasizes the educational objective involved in development of the FORCE intervention, focusing on the link between bodily exercise and the incentive that induces a larger number of people to form and lead "active and healthy lives" assisted by the appropriate curriculum. In order to update the focus and scope of curriculums that claim or intend to improve people's motivation and capability to live a life full of action and health, a multi-dimensional concept of physical activity is presented. The contention is that the skills, understanding and knowledge included in the curriculums should be extended, and organizations and people within and outside existing formal education structures should try to turn a lifelong curriculum into their collective responsibility (Penney & Jess, 2010).

Therefore, perhaps the solution lies in combining elements of strengthening social skills, providing social cognitive intervention and offering opportunities for the elderly to meet new friends (UNECE, 2012).

The Interaction between Physical Activity and a Decrease in the Fear of Falling in the Elderly

One of the means that may prevent falls is exercise intervention (Gillespie, 2012b), globally recommended in proven guidelines for prevention of falls. Of the reviews published on similar subjects (Bula 2011b; Gillespie, 2012b; Howe, 2012; Liu, 2009b; McClure, et al., 2005; Zijlstra, 2007) only a small number have focused specifically on exercise and the effect it may have on fear of falling.

Neural and cognitive deterioration among people has been minimized or even turned around using interventions that include physical exercise and fitness courses based on strength and flexibility. Other influencing factors include education, training and practice, occupation, experience, diets rich in anti-oxidants, engaged lifestyle and estrogen replacement (Kramer, et al., 2004).

Among the key factors in life are motor skills which even the elderly have to learn or relearn within the new task training for everyday activities or rehabilitation. In fact, learning that occurs in the course of motor task performance for acquisition of skills or following it plays a significant role in healthy living and while implementing rehabilitation therapies for the elderly (Hall et al., 2011).

It has further been proven that physical training may positively affect cognitive capacities, not only physical fitness (Angevaren, et al., 2008) particularly when it comes to executive control processes (Colcombe & Kramer, 2003). Executive control process include inhibition, planning, coordination, working memory and scheduling and are extremely significant for a person's routine function.

III.3 The FORCE Intervention Program Description

The researcher had developed the FORCE intervention program in order to improve and promote the quality of life and well-being of third and fourth age adults, since there are very few programs particularly suited to this age group. The current section describes the theoretical base for the program, its rationale and significance, target population, and the aims of the research that examines its contribution to the participants' quality of life.

Theoretical Base of the FORCE Program

The study of core muscles workout in older adults is a large-scale, community-based health promotion intervention to encourage seniors to exercise more, and to improve their Quality of life (QOL) by increasing their intake of using core muscles on their daily basis. It is unique in combining a public health recruitment model with an individually tailored intervention program.

This new FORCE program is based on two foundations: focus on the population of the elderly based on the belief that quality of life may be improved at any age, and investigation of this intervention program, based on psycho-education and multiple behaviors (stages of change). This combination of the above factors provides the essential rationale of the current study. When it comes to multiple- behavior intervention, investigation of this type is important for research in health promotion, since they may have greater impact on public health than single-behavior interventions.

The FORCE program integrates two theoretical models: (**1) The Whole Person Wellness Model (Kang & Russ, 2009**) -a psycho-education model with six dimensions of wellness. In the FORCE workout program the idea was to attain five of the above wellness aspects: social (group setting), intellectual (discussions), spiritual (mind and body workouts), emotional (group coping) and physical. Each of these aspects adds to their wellness, operating in unison to generate behavioral changes (Bar-Netzer & Bocoş, 2018).

(2) The Trans-Theoretical Model (TTM) - stages of change, a bio-behavioral model (Prochaska et al., 1983; 2008) that may apply to different settings, behaviors and populations.

Figure No. III.4 presents the stages of the TTM model.

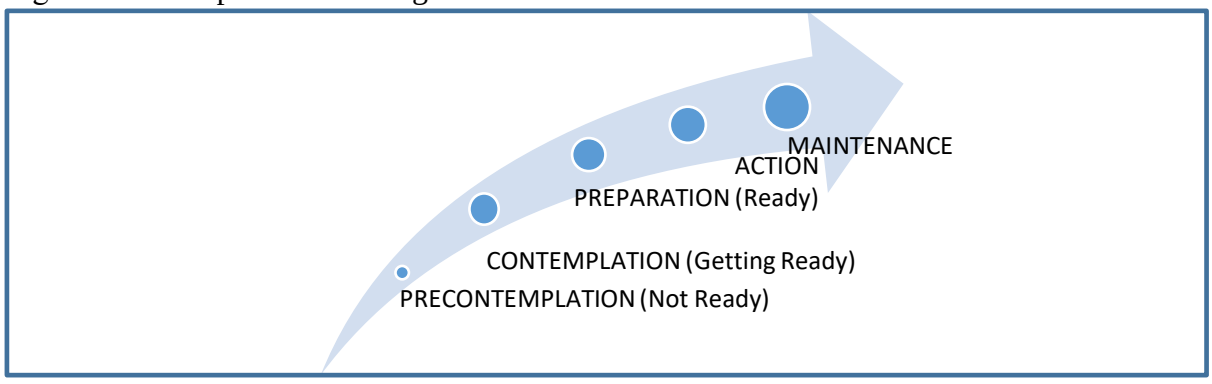

Figure No. III.4: *The TTM Model: Stages of Change*

The FORCE Intervention Program in Practice

The researcher formed the FORCE intervention program in order to improve and promote the quality of life and well-being of third and fourth age adults, since there are very few programs particularly suited to this age group.

The FORCE is an intervention program especially developed for seniors as a group learning program (collective) but the improvement is individually with regard to all four TTM components: stages, processes, decisional balance and self-efficacy. This intervention program is based on an educational approach of experiential and collaborative learning using educational models and adapting activities to the physical capabilities of the elderly.

Bar-Netzer & Bocoş (2018) explains that the FORCE program integrates psycho-education with physical training associated with emotional wellbeing process. This program emphasizes the importance of the engagement with physical activity in the third and fourth age leading to improved quality of life.

The combination of psycho-education empowers learning in stages and may enable the elderly participants to improve their quality of life.

All intervention materials are aimed at raising the level of physical and social activities and on providing a regular exercise schedule in particular to promote quality of life and self-efficacy at these ages.

The target population of the study is a group of older adults (age 60 to 90+) coming from small villages (cooperative agricultural villages). They are a significant multicultural population that includes orthodox, Holocaust survivors and secular people. They come from a variety of socio-economic statuses and beliefs that influence their well-being and lifestyle. The participants of the FORCE program practiced twice a week for 12 months.

III.4 Gap in Knowledge

There are not enough studies that examine educational programs for the third and fourth age, which combine psycho-education with the physical dimensions. The current study examines the effect of FORCE program on improving Quality of Life, Self-Efficacy and everyday functional physical capabilities among older adults.

III.5 Conceptual Framework

Figure No. III.5 presents the conceptual framework on which the study was based when developing the FORCE intervention program.

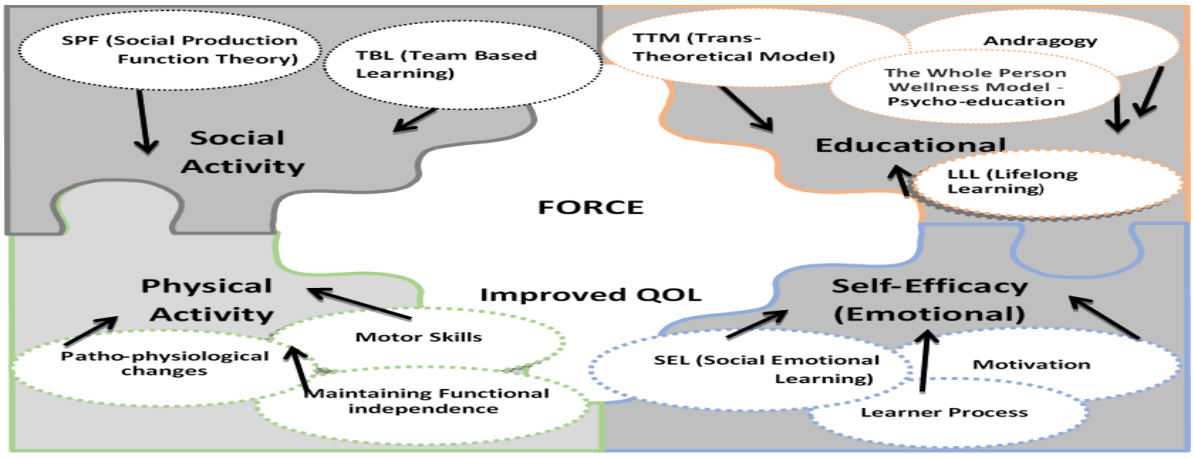

Figure III.5: *Key Concepts on which the study was based when developing the FORCE*

CHAPTER IV:
DESCRIPTION OF THE RESEARCH ENTITLED: "THE EFFECT OF CORE MUSCLE INTERVENTION PROGRAM ON IMPROVING QUALITY OF LIFE IN OLDER ADULTS THROUGH A LIFELONG LEARNING APPROACH"

This chapter describes the research by fulfillment of the stated purpose of this study. In order to clarify each of the research components, the chapter was divided into ten sections: the research aims, questions and hypotheses, research variables, participants, methodology, paradigm, research strategy (stages and data analysis) and data collection methods.

IV.1 Research Aims

1. To develop an intervention program (FORCE), based on core muscle strengthening and social activity, which may contribute to the quality of life and self- efficacy of the third and fourth age adults.
2. To examine the contribution of FORCE intervention program on quality of life, self-efficacy and everyday functional physical capabilities for older adults.

IV.2 Research Questions

Question 1: Does the FORCE program influence the quality of life of older adults in the third and fourth age?

Question 2: Does the FORCE program influence self-efficacy of older adults in the third and fourth age?

Question 3: Does the FORCE program contribute to the improvement in everyday functional physical capabilities of third and fourth age adults?

IV.3 Research Variables

Independent Variables:

1. Carry out the intervention program based on core muscle strengthening and social activity of older adults in the third and fourth age.
2. Moderators variables: age, Body Mass Index (BMI), use of indoor products in Core muscle workout with home equipment's instruments (CMI) experimental group.

Dependent Variables:

1. The quality of life of older adults in the third and fourth age
2. The level of self-efficacy of older adults in the third and fourth age
3. The everyday functional physical capabilities of third and fourth age adults

IV.4 Research Hypotheses

Hypothesis 1a: The quality of life among the experimental groups will be higher than that of the control group.

Hypothesis 1b: The quality of life among the experimental groups at the end of the program would be higher than at the beginning of the program.

Hypothesis 2a: Self-efficacy among the experimental groups will be higher than that of the control group.

Hypothesis 3a: Everyday functional physical capabilities of the experimental groups will be greater than that of the control group, following participation in the intervention program.

Hypothesis 3b: Everyday functional physical capabilities of the group that used indoor products will be greater than the capabilities of the group that does not use the indoor products, following participation in the intervention program.

IV.5 Research Population

The study included three groups of participants:

1. CMI experimental group: N=59- an experimental group taking part in the intervention program, using indoor products
2. CM experimental group: N=28- an experimental group taking part in the intervention program, without using indoor products
3. CoG control group: N=19- a control group not taking part in the intervention program

106 men and women aged 60-91 took part in the study. The participants filled out health declarations, submitted medical certificates attesting that their health was normal for their age, enabling them to take part and be compared to one another.

Table IV.1 displays the amount of participants and age parameters of the three study groups.

Table IV.1: *Descriptive Statistics of Characteristic of the Three Study Groups: CMI, CM and CoG Questionnaire for Collection the Amount of Participants and Age Parameters*

Group	CMI N=59		CM N=28		CoG N=19	
M\SD	M	SD	M	SD	M	SD
Age	72.50	6.00	73.00	6.00	75.00	9.00

The number of participants in the control group is smaller than in the experimental groups for several reasons:

1. There are few groups that undergo regular training in the entire area and its vicinity.
2. Some of the groups that had participated in regular training with other teachers were unwilling to provide personal details and/or undergo observation and undertake 12 months of research; although the management and professional teachers tried to convince them that this was important.

The reason that the CM experimental group is smaller than the CMI experimental group was that at the beginning of the study all groups were requested to purchase special equipment for home use. All classes were similar but some of the participants were unwilling to use the devices and were therefore placed in a separate group.

IV.6 Research Design

The study contained 3 stages:

Stage 1: Development and implementation of the FORCE program.

Stage 2: Quantitative study exploring the contribution of FORCE intervention program on quality of life, self-efficacy and everyday physical capabilities.

Stage 3: Qualitative study exploring the participants' perceptions about their self-efficacy and quality of life following the FORCE program.

The research used a mixed-method approach Mixed-Methods approach:

Stage 2 was a quantitative research – using questionnaires and quantitative tests, while stage 3 was a qualitative research using open in-depth interviews.

Use of this approach leads to better comprehension of the studied phenomenon and identification of its advantages. (Johnson & Onwuegbuzie, 2004; Creswell &Plano-Clark 2006). Furthermore, using this method may provide more extensive response to research questions that are beyond the restrictions that come with a single approach.

Table IV.2 describes research design and methodology and each of the stages including goal, research questions, hypotheses, tools and analysis methods.

Table IV.2: Research Design and Methodology

Stage	Aim	Participants	Research Question	Tool	Analysis
Stage 1: Development and implementation of the FORCE program	To develop and implement the FORCE intervention program			Designing a curriculum for the FORCE program *Questionnaire for Collection of Demographic, Physical and Behavioral Information	Gender, Occupation: chi square test *Age, BMI: ANOVA *
Stage 2: Quantitative study exploring the contribution of FORCE intervention program on quality of life, self-efficacy and everyday physical capabilities	To examine the contribution of FORCE intervention program on quality of life, self-efficacy and everyday physical capabilities of older adults	CMI: N=59 CM:N=28 CoG: N=19	1. Does the FORCE program influence the quality of life of older adults in the third and fourth age? 2. Does the FORCE program influence self-efficacy of older adults in the third and fourth age? 3. Does the FORCE program contribute to the improvement in everyday functional physical capabilities of third and fourth age adults?	Questionnaires and Tests: Quality of Life Questionnaire (SF-36) (RAND Health Care). A certification on using indoor products (for CMI) 1. Physical Activity Self-Efficacy Measure (Resnick, et al., 2000). 2. Physical Activity Outcome Expectancy Measure (Perkins et al., 2008). 3. Social Activity Self-Efficacy Measure (Perkins et al., 2008). 4. Social Activity Outcome Expectancy Measure (Perkins et al., 2008).	ANOVA with repeated measures T-test *4 S-E questionnaires: KRUSKAL-WALLIS TAT (TW,TB); TUG; FR; SL:

				*Tinetti Assessment Tool (TAT): including Tinetti walking (TW) and Tinetti Balance (TB) (Tinetti, 1986). *Timed Up and Go Test (TUG) (Podsiadlo & Richardson, 1991) * Functional Reach Test (FR) (Duncan et al. 1990). * Improved One Leg Stand Test (OLS) / Cube Improved One Leg Stand Test (CIOLS) (Guskiewicz, 2001). *Straddle Legs (SL)	ANOVA with repeated measures * IOLS, CIOLS: chi square test
Stage 3: Qualitative study exploring the participants perceptionsabou t their self-efficacy and quality of life following the FORCE program	To examine the participants' perceptions of the program's contribution to quality of life, self-efficacy and physical capabilities	CMI and CM: N=44	The same questions as in stage 2	In-depth semi-structured interviews	A systematic content analysis - identifying themes and categories Triangulation with the quantitative analysis

IV.7 Research Tools

The current study used three types of research tools (Questionnaires, Everyday Functional Physical Capability Tests and In-depth Semi-structured Interviews.

IV.7.1 Research Questionnaires

Each questionnaire was convenient to use and was found valid and reliable (Barberger-Gateau et al, 1992; Tong & Man, 2002; McHorney, et al., 1993; Brazier et al., 1992; Bentor & Epshtein, 2001).

The following questionnaires were used in the study:

International Physical Activity Questionnaire (IPAQ)

Assesses physical activity habits over the seven days that preceded the questionnaire and relates to hard physical effort, medium effort and walking. The researcher used the IPAQ manual for reliability and validity (Booth, 2000) (Appendix 3).

Instrumental Activities Daily Living (IADL)

Evaluate the participants' crucial everyday functions such as shopping, cooking, cleaning, using transportation, using a telephone (Barberger-Gateau et al, 1992; Tong & Man, 2002) (Appendix 4).

Questionnaire for Collection of Demographic, Physical and Behavioral Information

Provide information and documentation of the research population, its composition and changes that occur over time in terms of age, weight, height, physical condition, occupation and other parameters (Appendix 2).

Quality of Life Questionnaire (SF-36)

Assesses quality of life. The questions span eight aspects: physical function, pain, limited function due to physical problems, limited function due to personal or emotional problems, emotional feeling, social function, sense of energy and perception of health (McHorney, et al., 1993; Brazier et al., 1992; Bentor & Epshtein, 2001) (Appendix 5).

Self-Efficacy Questionnaires

The study examined the self-efficacy of the 3 experiment groups in both physical activity and social activity using 4 questionnaires (Appendix 6):

1. **Physical Activity Self-Efficacy Measure** (Resnick, et al., 2000)**.**
2. **Physical Activity Outcome Expectancy Measure** (Perkins et al., 2008).
3. **Social Activity Self-Efficacy Measure** (Perkins et al., 2008).
4. **Social Activity Outcome Expectancy Measure** (Perkins et al., 2008)**.**

Therefore, the explanation of the questionnaires is divided into two sections:

1. Self-Efficacy of Physical Activity Measures.
2. Self-Efficacy of Social Activity Measures.

IV.7.2 In-Depth Semi- Structured Interviews

In-depth semi-structured interviews were carried out with the participants in order to provide in depth information about their feelings, emotions and perceptions relating to the contribution of the FORCE program to their everyday quality of life, self-efficacy and physical capabilities.

In-depth semi-structured interviews were held with 44 randomly selected participants from experimental groups CMI and CM (Appendix 8).

IV.7.3 Everyday Functional Physical Capability Tests

The study used several tests that assessed everyday functional physical capabilities (https://www.sralab.org/rehabilitation).

Test-retest reliability (Faber et al. 2006**;** Steffen, et al., 2002; Lin, et al., 2004; Duncan et al. 1990;1992), excellent interrater reliability for frail elders (Thomas, et al., 2005; Podsiadlo & Richardson, 1991), and validity was found for older adult (Guskiewicz, et al., 2001; Iverson, et al., 2013; Weiner, et al., 1992; O'Sullivan, & Schmitz, 2007).

Tinetti Assessment Tool (TAT)
Area of assessment: Balance- Vestibular; Balance- Non-vestibular; Gait.
TAT explanation: The higher the score, the greater the subject's independence (Lin, et al., 2004; Faber, et al., 2005).

Timed Up and Go Test (TUG)
Area of assessment: Balance- Non- vestibular; Functional Mobility; Gait; Vestibular.
TUG Test explanation: The time it takes the participant to complete the test will be shown to be well correlated to level of functional mobility (Podsiadlo & Richardson, 1991).

Improved One Leg Stand Test – OLS / Cube Improved One Leg Stand Test (CIOLS)
Area of assessment: Balance-Vestibular; Balance- Non- vestibular; Functional Stability; Vestibular.
The IOLS\CIOLS explanations: standing on one leg on the floor\ yoga cube.

Functional Reach Test (FR)
Area of assessment: Balance-Vestibular; Balance- Non- vestibular; Functional Mobility; Vestibular.
FR Test explanation: measuring the maximum distance an individual can reach forward while standing in a fixed position.

Straddle Legs (SL)
Area of assessment: Balance; Gait; Vestibular.
SL Test explanation: in the course of the TB tests some subjects tend to rise from a sitting position and begin to walk while others didn't.

Table IV.3 sums up the Physical Dependent Variables.

Table IV.3: *Physical Dependent Variables*

Dependent variable	Assessed with tests	Measurement	Explanation
1. Dynamic balance capability	Tinetti Assessment Tool-TW (walking); TUG (second)	Average standard scores of dynamic balance tests	The higher the value, the better the dynamic balance
	FR (centimeter) TUG (Second)		The lower the value, the better the dynamic balance
2. Static balance capability	Tinetti Assessment Tool–TB (balance); FR (centimeter); IOLS (second)	Average standard scores of static balance tests	The higher the values on each of the assessments, the better the static balance capability
	SL (centimeter)		The lower the value, the better the static balance
3. Risk of falling	FR (centimeter) IOLS (second)	Average standard scores of risk of falling tests	The higher the values, the lower the risk of falling
	TUG (second)		The lower the values, the lower the risk of falling

IV.8 Data Analysis

The second stage of the research included the following statistical tests:

The three groups' background characteristics were compared using chi square test for categorical data (gender, occupation) and ANOVA for continuous data (age, BMI).

ANOVA with repeated measures was used for comparing the 3 groups before and after the intervention period for variables like SF36 factors, TUG, TW, TB, FR, SL, and used in order to compare the 2 intervention groups in 3 times: before the intervention, mid of the intervention and after the intervention period for these variables.

Categorical variables like IOLS, CIOLS, were compared using chi square test.

Self-efficacy and variables that were not normally distributed were tested using nonparametric tests like KRUSKAL- WALLIS.

Statistics for each analysis in the instruments questionnaires of daily use are based on the T-test.

All statistical tests were done using SPSS version 25 the critical value for significance difference was $p \leq 0.05$.

* Note: the everyday functional physical capability tests were recorded on video. They all required repeated kinological analysis, i.e. repeated viewing in order to determine the required score values.

Qualitative content analysis by themes and categories of the in-depth interviews was applied in the third stage of the research.

According to Shkedi's (2011) recommendation the interviews were analyzed in the following manner: Generating categories for analysis, Deciphering and organizing data, Determining the categories and Category update.

CHAPTER V:

FINDINGS EMERGING FROM THIS RESEARCH

This chapter presents the quantitative and qualitative findings according to the research questions, examining the contribution of the FORCE program to the quality of life, self-efficacy and everyday activity capabilities of third and fourth age adults.

V.1. Findings Related to Background Variables of the Study Participants

Table V.4 presents the age and the BMI of the study participants.

Table V.4. *Characteristics of the Three Study Groups (CMI, CM and CoG) - Age and BMI Parameters*

Group	CMI N=59		CM N=28		CoG N=19	
M\SD	M	SD	M	SD	M	SD
Age	72.50	6.00	73.00	6.00	75.00	9.00
BMI	27.00	4.00	26.00	4.00	26.00	3.00

The experimental groups and the control group are comparable and were found to be similar.

V.2 Findings Related to the Contribution of the FORCE Program to the Quality of Life of the Study Participants (Research Question No. 1)

The SF-36® Health Survey that examine Quality of Life was administered to all study participants prior and after participation in the Force intervention program.
The SF-36 questionnaire refers to eight (8) factors connected to quality of life:
(1) Physical Functioning; (2) Limited Physical Health (3) Limited Emotional Health (4) Energy- vitality; (5) Emotional Wellbeing (6) Social Functioning; (7) General Health and (8) Bodily Pain.
Two-way ANOVA with repeated measurements (group X time) was carried out- the three groups were compared in Quality of Life before and after the intervention.

Key findings relating to the program's contribution to the participants' qualify of life are specified below:

A. **Significant improvement, following participation in the FORCE program was found on 6 out of 8 parameters of Quality of Life**: Physical functioning; Limited Emotional functioning; Energy; Emotional wellbeing; Social functioning; General health. In the Limited Physical health parameter there was an improvement but not significant. (Between the two experimental groups, no significant difference was found).

B. 3 (out of 8) parameters exhibited a significant interaction in the experimental groups:
Energy [F(2,41) =14.93, (P<0.001)]
Emotional wellbeing [F(2,41) =9.33, (P<0.001)]
Pain [F(2,41) =4.25, (P=0.02)]**.**

Energy- Vitality

Figure No.6 displays the mean score and standard deviation of the three study groups at pre and post points for the energy variable.

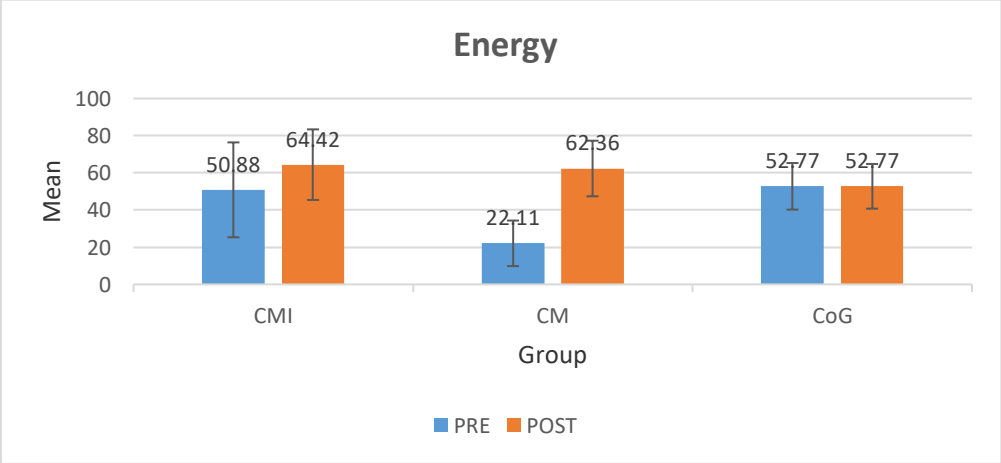

Figure No.6. *Energy – A Comparison of the Mean Score and Standard Deviation for the Three Study Groups (CMI, CM and CoG)*

The findings show that following the intervention program the two experimental groups' energy significantly increased, i.e. they respond differently from the control group that showed no significant difference following the intervention program.

Emotional Well-Being

Figure No. V.7. displays mean score and standard deviation results for the three study groups at pre and post points regarding the emotional well-being parameter.

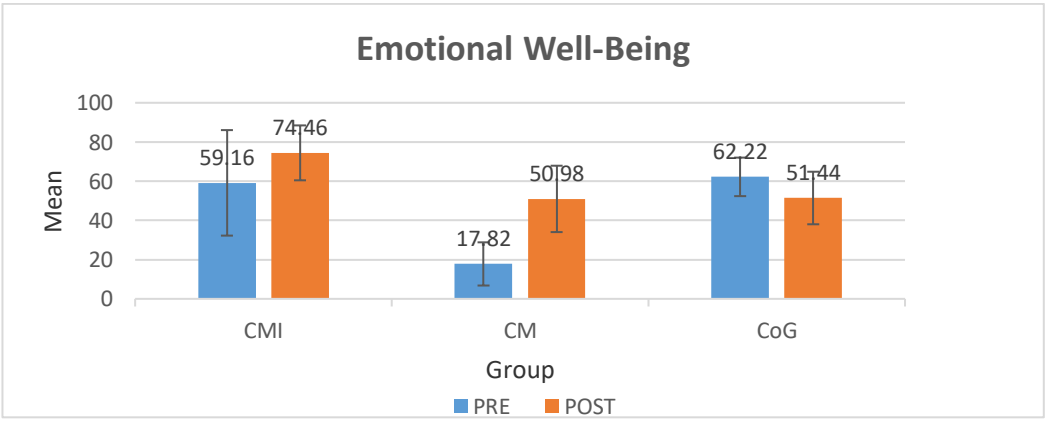

Figure No. V.7. *Emotional Well-Being – A Comparison of the Mean Score and Standard Deviation for the Three Study Groups (CMI, CM and CoG)*

This finding shows that following the intervention program both experimental groups exhibited significant improvement in their emotional well-being compared to the control group that did not exhibit a difference.

Pain - Bodily Pain

Figure No. V.8. demonstrates mean scores and standard deviation of the three study groups at two points in time – pre and post – relating to pain

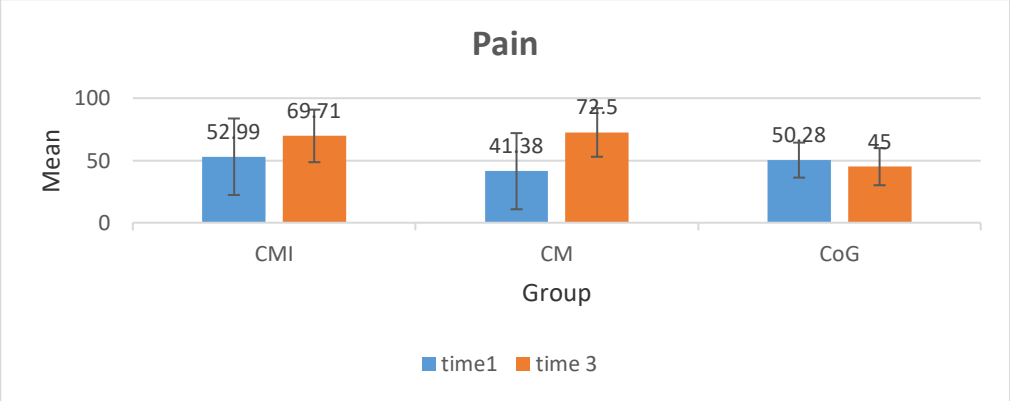

Figure No. V.8. *Pain- A Comparison of the Mean Score and Standard Deviation for the Three Study Groups (CMI, CM and CoG)*

The findings show no significant difference in pain between the groups at the pre-intervention stage. However, after intervention there was a difference between the experimental groups and the control group although both intervention groups reported similar results – increased pain. The interaction between CMI and CM groups was due to the fact both groups suffered greater pain than the control group (p=0.02).

It can be assumed that it was due to internal muscle strengthening and better training, and when a person is better trained, s/he is better aware of any change in the bodily pain.

Hypothesis 1a: The quality of life among the experimental groups would be higher than that of the control group (who did not participate in the FORCE program).

In light of these research findings hypothesis 1a was partly confirmed for the following parameters: Energy, Emotional wellbeing and Pain

of the control group **was confirmed.**

Hypothesis 1b: The quality of life among the experimental groups at the end of the program would be higher than at the beginning of the program.

In light of these research findings hypothesis 1b was confirmed.

V.3 Findings Related to the Contribution of the FORCE Program to Self-Efficacy of the Study Participants – (Research Question No. 2)

At the end of 12 months of research, the participants
filled self-efficacy questionnaires.
Four variables were calculated and compared between the three groups:

1. **Physical Activity Self-Efficacy Measure** (Resnick, et al., 2000)**.**
2. **Physical Activity Outcome Expectancy Measure** (Perkins et al., 2008).
3. **Social Activity Self-Efficacy Measure** (Perkins et al., 2008).
4. **Social Activity Outcome Expectancy Measure** (Perkins et al., 2008)**.**

Table V.5. describes the statistical differences between the groups.

Table V.5. *The Means of Ranking Among the Study Groups Participants*

Questionnaire	**CMI** N=26	**CM** N=21	**CoG** N=19	**Kruskal-Wallis H**	**P**
Physical Activity Self-Efficacy Measure	41.90	38.14	16.87	20.50	<0.001
Physical Activity Outcome Expectancy Measure	36.73	34.90	27.53	2.86	0.24
Social Activity Self-Efficacy Measure	39.10	41.93	16.53	21.13	<0.001
Social Activity Outcome Expectancy Measure	27.23	29.29	24.47	0.73	0.69

Table V.6. displays the correlation coefficients.

Table V.6. *A Comparison of Correlation Coefficients (Rs) Between the Three Study Groups CMI, CM and CoG*

	CMI (N=26)	**CM(N=21)**	**CoG (N=19)**
Physical activity efficacy x advantages of physical activity	0.502* (0.13 – 0.75)	0.322 (-0.14 - 0.67)	0.383 (-0.09 – 0.71)
Social activity efficacy x advantages of social activity	0.259 (-0.15 – 0.60)	0.359 (-0.56- 0.88)	0.770* (0.48 – 0.91)

*(P<0.05)

The major findings regarding the program's contribution to self-efficacy are:

1. Using the Kruskal-Wallis test, a significant difference was found between the three study groups of participants on two variables: Self-efficacy for the Physical activity and Self-efficacy for the Social activity as well (P<0.001). The self-efficacy for physical activity and for social activity of the experimental groups are higher than in the control group

2. There is no significant difference between the groups in the two other variables: advantages of the physical and the social activity. In other words, their approaches are similar on these issues.

3. No significant differences were found between the groups' means in the importance of the advantages of physical activity and in the importance of the advantages of social activity (Kruskal-Wallis test).

4. Significant correlation coefficients (Spearman) were found in the relation between self-efficacy and advantages of physical activity in the CMI experimental group. I.e. the higher one's self-efficacy in physical activity, the higher their approach to its advantages**.**
5. Significant correlation coefficients (Spearman) were found in the relation between self-efficacy and social activity in the control group. I.e. the higher one's self-efficacy in social activity, the higher the approach to its advantages.

Hypothesis 2a: Self-efficacy among the experimental groups following the intervention program will be higher than that of the control group (who did not participate in the FORCE program).

In light of these research findings hypothesis 2a was confirmed.

V.4. Findings Regarding the Contribution of the FORCE Program to Everyday Functional Physical Capabilities of the Research Participants (Research Question No. 3)

Comparison of everyday functional physical capabilities related to quality of life at pre and post-points for all research participants was made by these tests: Tinetti Assessment Tool (TAT) - including Tinetti Balance and Tinetti Walking Tests (TB and TW), Time Up and Go (TUG), Functional Reach (FR), Improved One Leg Stand, Cube Improved One Leg Stand (IOLS and CIOLS) and Straddle Legs (SL).

In the first stage, a comparison of quality of life physical tests among the three study groups at two points in time was made- prior to the FORCE intervention program (pre) and when it was over.

Two-way ANOVA with repeated measures (group X time) was carried out.

The interaction shows that the two experimental groups improved more than the control group in the following variables:

1. Tinetti Balance (TB) [$F_{(2,95)}$=18.62 (P<0.001)] and Tinetti Walking (TW) [$F_{(2,94)}$=5.68 (P=0.005)].
2. Time Up and Go (TUG) [$F_{(2,93)}$= 19.23 (P<0.001)].
3. Straddle Legs (SL) [$F_{(2,94)}$= 8.18 (P=0.001)] .
4. One Leg Stand (OLS) ($\chi^2_{(10)}$= 34.82; P<0.05)
5. Cube One Leg Stand (CIOLS) ($\chi^2_{(8)}$= 33.03; P<0.05)

Between the two experimental groups there was a significant difference only in the Straddle Legs (SL) test [$F_{(2.74)}$ =3.76 (P=0.02)]: **the experimental group using the indoor products, was higher than the experimental group that does not use them, at the end of the intervention program,, only in this parameter.**
In the other variables insignificant difference were found.

Hypothesis 3a: Everyday functional physical capabilities of the experimental groups, following participation in the intervention program, will be greater than that of the control group.

In light of these research findings hypothesis 3a was confirmed.

Hypothesis 3b: Everyday functional physical capabilities, following participation in the intervention program, of the group that used indoor products will be greater than the capabilities of the group that does not use the indoor products.

In light of these research findings hypothesis 3b was confirmed only in the Straddle Legs parameter (SL).

In the second stage, the two experimental groups, CM and CMI, were compared prior to the onset of the Force intervention program, in the middle of the process mid (4-6 months after it began) and following the program (12 months after).

Two-way ANOVA with repeated measures (group x time) was carried out.

Along the three time points, the groups do not have significant difference and all show improvement. **Even though the experimental groups had higher mean score at the post point comparing to the pre, there was no significant difference (no interaction).**

V.5 Qualitative Findings Relating to the Contribution of the FORCE Program to the Quality of Life of the Participants

With regard to the program's contribution to the participants' quality of life, five themes were specified: the cognitive aspect, the emotional-psychological aspect**,** the social aspect**,** the physical aspect **and,** the motivational aspect**.**

Figure V.9. sums up the interviews' findings of the programs' contribution to QOL

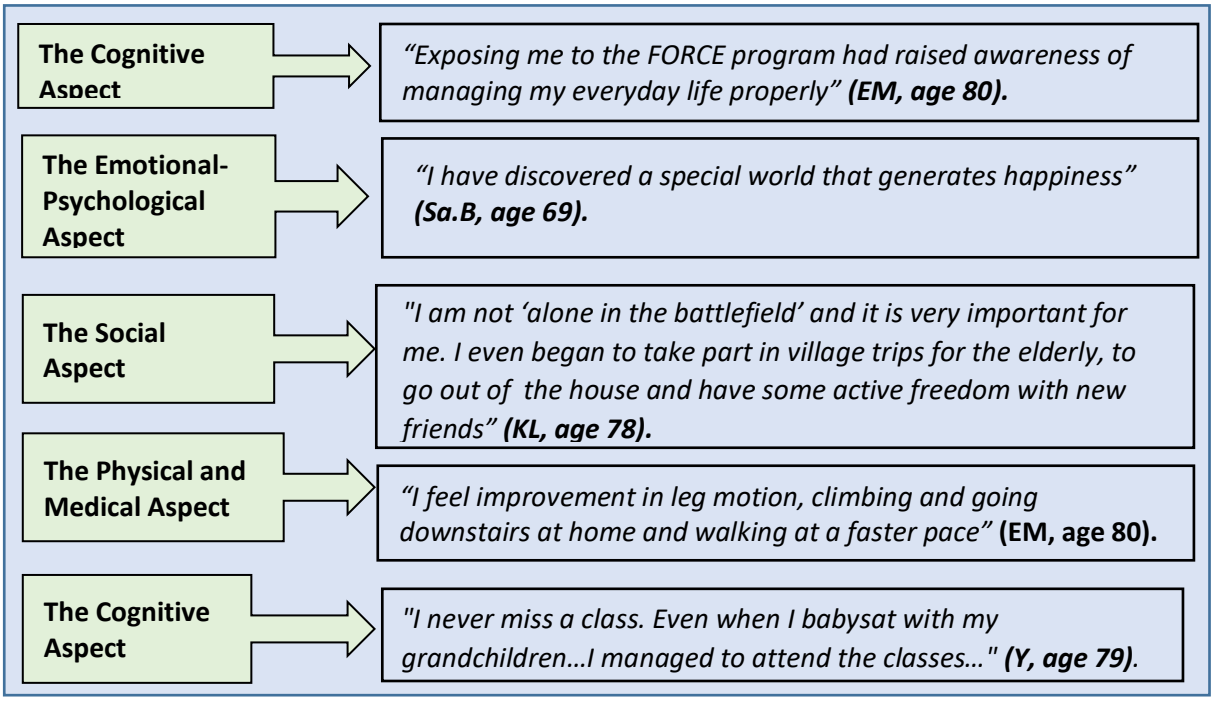

Figure No. V.9. *Programs' Contribution to Quality of Life*

Figure No. V.10 sums up the themes and categories of the FORCE program's contribution.

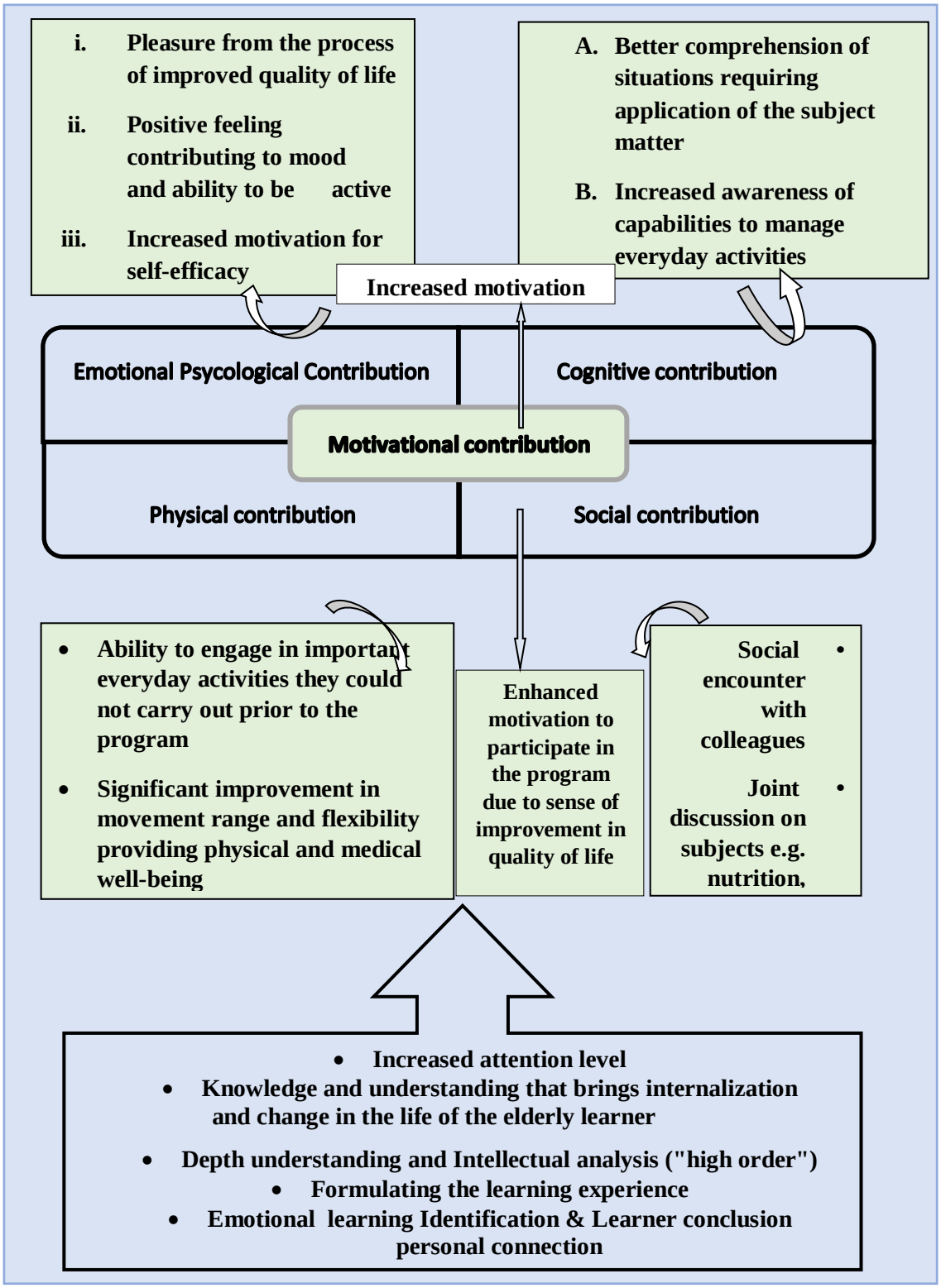

Figure No. V.10 *The Themes and Categories of FORCE Program's Contribution*

V. 6 Triangulation of Quantitative and Qualitative Findings

The following figures present a summary of the integrative findings deriving from the quantitative and qualitative analysis (the physical tests, questionnaires and interviews, based on review of the relevant literature).

Figure No. V.11 sums up the triangulation of quantitative and qualitative findings the Influence of the FORCE Program among third and fourth age adults

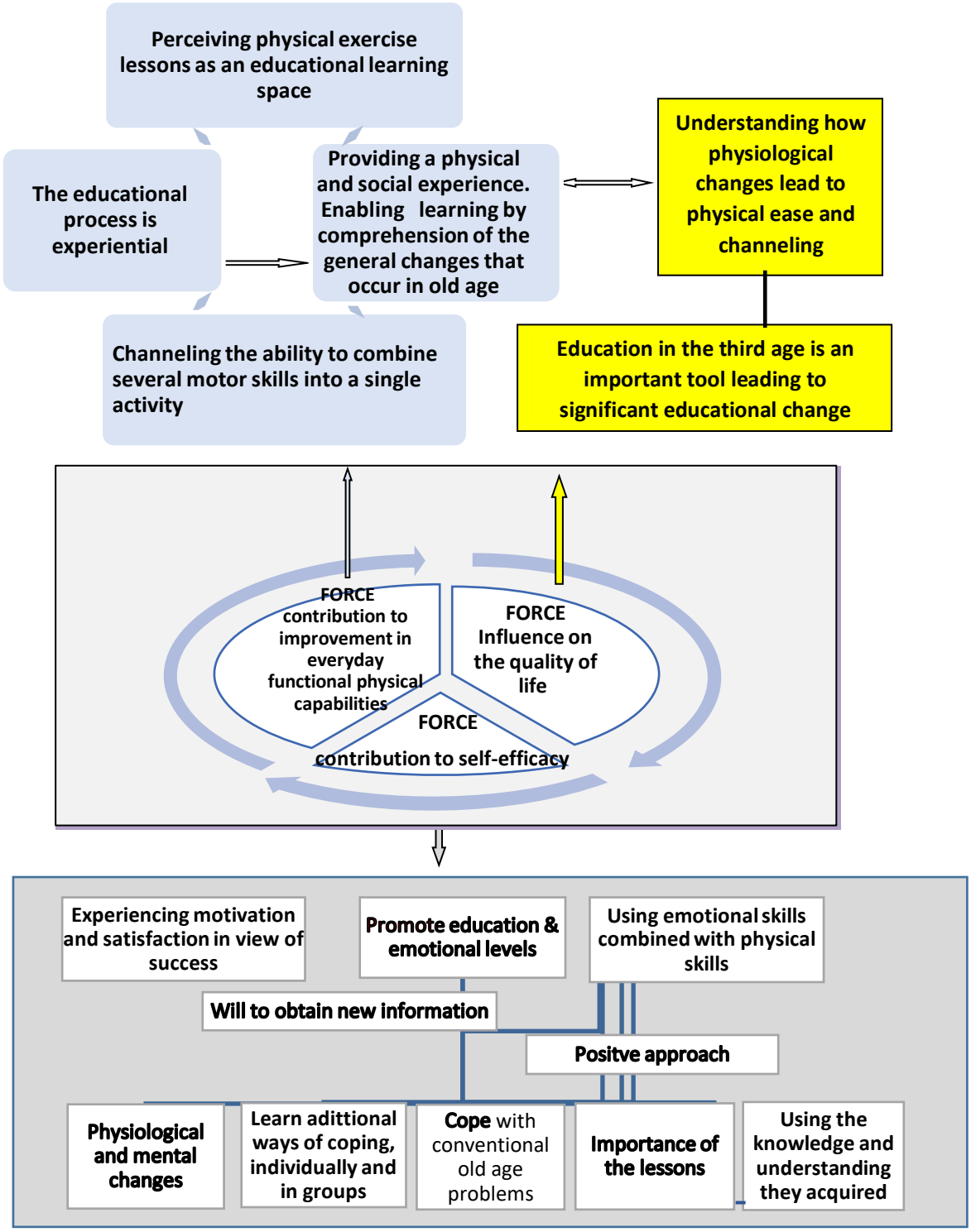

Figure No.V.11. *The Triangulation of Quantitative and Findings*

CHAPTER VI: DISCUSSION OF THE FINDINGS

This chapter will discuss interpretation of the findings in relation to the key theories mentioned in the literature review and previous research on this subject**.**

VI.1. Discussion of Findings Relating to Quality of Life

The findings emerging from the research attest to improvement in 7 of the 8 quality of life parameters between the beginning and end of the program among the two experimental groups.

The significance of this finding is that the experimental group participants showed higher energy in carrying out everyday tasks, better development of social ties, improved will to take part in joint family and social activities, rise in the will to improve their general quality of life. Findings of this study are similar to findings of previous studies dealing with the influence of physical exercise programs on quality of life of older adults. Participants have the ability to change personal habits due to physical and emotional changes that occur with age and to use the tools acquired in these programs to deal with ageing (Dunsky, et al., 2013; 2015; Netz et al., 2012b).

The study findings show improvement in emotional well-being proving that when working in a group in the FORCE program attention changes in various ways (by undermining posture, using devices, sequences and passages). Through an emphasis on creativity and interest and operating both body and mind, the emotional well-being improved and influenced QOL.

Program participants relate improved emotional well-being to their involvement in social activities that provides them with not only physical but emotional energy to handle social pressure. Furthermore, the participants emphasize the part psycho-education in the program plays in providing them with tools for positive and optimistic thinking, important for this age.

Research findings regarding pain as a measure of quality of life among third and fourth age adults showed that pain measure rose among the experimental groups compared to the control group, contrary to the hypothesis. The sense of Pain of the experimental groups increase may be related to three reasons: The intense and correct workout carried out by the participants; The knowledge on focusing pain and the interaction between the researcher and the participants- they tended to expose and talk more about their pain than the control group.

Findings show improvement in the overall emotional function following participation in the FORCE intervention program.

Emotional health includes: Identifying and building personal strengths; Realistically seeing the positive in all situations – good or bad; Developing the resiliency to learn and overcome challenging situations, Seeing the good in yourself, Creating coping skills to help with mental health issues and stress, Living your life with a sense of purpose (Netz, et al., 2012b; Bar-Netzer & Bocos, 2018).

Social functioning is an issue that is emphasized and connected to all aspects of quality of life. The research findings show significant improvement in social functioning influencing improvement in the older adult's quality of life from the following aspects:

A. **From loneliness to social activity** – expansion of cycles and social ties, personal and family circles, and peripheral social circles.
B. **Active participation in social events**, **and rise in the motivation to initiate and realize these ties.**

These findings are compatible with professional literature.

Charles & Carstensen (2010) claimed that it should be noticed that as social circles reduce, the chance for isolation gets higher, and the negative effects increase. However, the positive effects that emerge from social relationships are more important than the amount of the social circles among the elderly. The closest circle, which represent the family members, in general, causing highest level of positive emotional experiences in older adults when interacting, more than in younger adults (Charles & Piazza, 2007). Older people who are involved in a strong social network and provide social support to others report vitality, fewer negative emotions, and even lower mortality (Charles & Carstensen, 2010).

Discussion of Findings Relating to the Psycho-Educational Component of the Program

In addition to findings relating to research hypotheses dealing with quality of life parameters, research findings show the importance of the psycho-educational component of the FORCE program.

The FORCE program includes a psycho-educational component relating to increasing participants' awareness from the educational, mental, social and physical aspects that would improve their quality of life by streamlining everyday physical actions. The elderly usually remember the pain but not the improvement, raising the importance of the instructor's explanations that must be adapted to age characteristics and needs of third and fourth age participants. The participants state those explanations decreased anxiety and contributed to deeper understanding of the emotional, social and physical characteristics of this age-group. When participants experienced improved quality of life they exhibited better perseverance in taking part in the program and became more active with higher initiative.

These findings are compatible with prior studies that showed an intervention program that includes psycho-education and physical exercise improves the quality of life among the elderly (Bar-Netzer& Bocos, 2018; Kok & Reynolds, 2017; Liblich, 2018).

In summary, this research proves that the FORCE intervention program constructed especially for this research, achieved the goal of improving quality of life among third and fourth age elderly persons. This finding is particularly important due mainly to the increase in this population based on technological advancement that increases life expectancy (Dunsky, 2015), since it enhances the need not only to lengthen life but also psycho-educational investment at this age.

VI.2 Discussion of Findings Relating to Self-Efficacy of Third and Fourth Age Adults

Study findings attest that Physical and Social Activity Self-Efficacy Measures are higher among the experimental groups compared to the control group. The in-depth interviews support these findings - the participants note improved self-efficacy.

The study findings show that the higher self-efficacy for physical activity thus self-efficacy for social activities grows. The experimental group participants (who took part in the program) described the influence of self-efficacy in several areas:

1. **Physical Self-Efficacy** – by sensing better physical self-efficacy – they believe in their ability to carry out physical activity due to participation in the program.
2. **Emotional Self-Efficacy** – program participants believe in their ability to contain more relationships, apply the subjects of discourse raised in the program when having discussions with people their age in coping with emotional situations, and note improvement in the sense of physical self-efficacy is linked to improved emotional self-efficacy.
3. **Social Self-Efficacy** –Self-efficacy for social activities is high and following this the will to take part in social events, meetings and different social circles and improve family ties arises.
4. **Self-efficacy for Improvement, Perseverance and Motivation for Action** – findings of the in-depth interviews show the feeling of improved self-efficacy provides motivation for continuity and the will to keep improving. The ability to help family and friends provides legitimation for the internal change process.

These finding require continued research to reach a more profound understanding of the connections between the above variables. Just a few studies were found to deal with this, e.g. the self-efficacy theory created by Bandura and implemented for elderly people from 63 to 92 years old, investigate the link that exists between self-efficacy in routine practical bodily aptitude and in social life in people of these ages.

This finding is new with regard to the third and fourth age, proving it is important to encourage them to take part in such programs in order to increase their motivation and self-efficacy thus expand the range of activities in which they feel they are able to take an active and effective part.

VI.3 Discussion of the Program's Contribution to Everyday Functional Physical Capabilities

Results of the study show that on all physical capabilities tests, program participants exhibited greater improvement than the control group. It should be noted that there was an improvement in both experimental groups at the endpoint than at the beginning, while in the control group in the endpoint the means were significantly lower than at the beginning.

The findings also show the two experimental groups exhibited higher results on all physical test values, but there were no significant differences between these two

experimental groups on most of the parameters. There was no previous research found that dealt with the influence of application of the tools learned in the program during everyday activities at home, in addition to participation in the program.

The key finding that arose from this study relates to positive influence of the FORCE program on balance among the elderly population (men and women. This finding is compatible with the findings of a previous study (Dunsky, et al., 2017) that investigated everyday functional physical capabilities and practical bodily exercise among older adults

The foundation of the FORCE program is a mix of isometric moves in a series of actions including exercises that are aerobic and non-aerobic and generate a larger extent of movement. In this fashion, muscles that control stability, the heart and lung system and dynamic and static equilibrium are developed (Dunsky, 2017). Additionally, training of this sort causes muscle mass to grow and this is of great significance for elderly people who suffer from fear of falling, due to great reduction of muscle mass and diminished bodily skills.

Control group failure on the Function Reach test (FR) that assessed a patient's stability by measuring the maximum distance an individual can reach forward while standing in a fixed position. This proves they could not attain stability in the exercise and therefore their results were disqualified at the beginning and end points, proving the above mentioned explanations.

It is worth mentioning that during the in-depth interviews the participants who used CMI indoor products tended to mention their physical improvement more than others, were more focused on defining their physical sensations, exhibited better physical comprehension and greater experience since they are using their body throughout the day and are able to compare comfort and pain levels in a better manner.

CHAPTER VII:
CONCLUSIONS AND RECOMMENDATIONS

This chapter deals with research conclusions derived from the findings (on the factual and conceptual levels), with the limitations of the study and recommendations for additional studies that could increase both practical and academic knowledge.

VII.1 Factual Conclusions

The factual conclusions are presented in relation to research questions on the issues of quality of life, self-efficacy and everyday functional physical capabilities.

Factual Conclusions Regarding Quality of Life, Self-Efficacy and Everyday Functional Physical Capabilities

With relation to the quality of life of the third and fourth age FORCE program participants, the key research conclusion is that their quality of life improved on most parameters. The findings shed light on the contribution of the FORCE program to the physical, social and emotional dimensions of quality of life.

The conclusion is that participation in the FORCE program that integrates psycho-education with physical training was associated with improvement in the older adults' quality of life.

According to previous studies, people in the third and fourth age suffer decline in their physical capabilities and social activity due to widowing, difficulty in taking part and lack of motivation to build new social ties, leading to low motivation to improve their self-efficacy.

Prior to the program, due to low motivation for physical activity, older adults would hesitate to leave their home and to take part in social and family activities. Following participating in the FORCE program, that took place in a group for an entire year, the improved motivation for physical activity leads to improved social self-efficacy.

The conclusion is that the FORCE intervention program decreases the barriers for taking part in physical activity, contributes to increased motivation thereby contributing to a change in social behavior that promotes sense of self efficacy of the elderly.

This conclusion is new with regard to the third and fourth age, proving it is important to encourage them to take part in such programs in order to increase their motivation and self-efficacy and expand the range of social activities in which they feel they are able to take an active and effective part.

In addition to work on core muscles, the FORCE program included psycho-educational explanations regarding the influence of everyday physical activity on quality of life, in order to enhance the participants' motivation to persevere and practice the skills they acquired in the program in all everyday activities.

Improvement in everyday functional physical capabilities was examined in well-known movement tests and the overall conclusion of the study is that participation

in this program is related to improvement in the vestibular system, physical balance, static and dynamic equilibrium, speed and functional movement.
One of the consequences of the intervention program is that the combination of core muscle work the Inside-Out Concept that operates local and peripheral core muscles ultimately influence posture, raise self-confidence among people in this age group and reduce fear of falling.

VII.2 Conceptual Conclusions- Promoting Quality of life in the Elderly

There are few programs that enhance quality of life in the third and fourth age and few organizations that allocate resources to provide response for the needs of this age group and therefore few studies have been carried out on this aspect. The current study was intended to fill the gap in knowledge relating to this issue.

An important conclusion arising from research findings is that participation in the FORCE program is perceived as responding to **three major needs of third and fourth age people:**
(1) The need to develop capabilities; (2) The need for social recognition and acceptance. (3) The need to enjoy experiences relating to activity in the program.

The FORCE intervention program is perceived as an opportunity to decrease the sense of loneliness of everyday routine and attain social recognition. Most participants are pensioners, some widowed and with relatively small social circles. The program provides the elderly with an opportunity to share and take part in knowledge provided in the course of lessons on subjects that are relevant for them, relating to the overall improvement in their quality of life. During the activity, social and emotional learning (SEL) and its connection with the lifestyle of the elderly is emphasized. Group interaction, sharing knowledge, motivation for success as well as providing feedback for the success of the program during practice, is a significant added value of the FORCE program.

The findings shed light on the integration of empowering learning processes in the FORCE program: integration of psycho-education, active colleague learning and physical activity exercising adapted to age and needs contributes to the pleasure, motivation and perseverance among older adults. It thus provides access to effective and significant learning that improves their quality of life. The program enables third and fourth age persons to choose activities that suit them and their lifestyle in order to enjoy the psychological advantages of long term physical activities. The motivation for achievement enhances motivation for physical activity as well as social activity, leading to significant improvement in their quality of life, expressed on four aspects:

(1)Improved state of mind; (2)Decreased pressure; (3)Improved motivation for physical and social activity; (4)Improved quality of life.

VII.3. Practical Implications and Recommendations

This study has applicable implications both in Israel and in other countries and cultures. In view of the significant increase in life expectancy, the need arises to develop programs that will deal and provide response to maintaining quality of life:

A. Professionals specializing in physical exercise can use the FORCE program to promote cognitive, emotional and social skills among this population. The Welfare Ministry, Education and Sports Ministry and global organizations such as the 'Joint', may be encouraged to include the program in their activities for improving quality of life
B. Further research can assess the long term impact of the FORCE program on Quality of Life and well- being.
C. Decision makers and local authorities may apply the program studied in the current research and see how they can include it in community frameworks for the elderly of this age
D. The specialization in third and fourth age adults in academic institutions that train physical education teachers, consultants and psychologists should be expanded with emphasis on quality of life and life-long learning, presented by the FORCE intervention program.

VII.4. Research Limitations

This study has certain limitations that should be acknowledged relating to the research tools, the researcher and inclusion capability:

A. Limitations relating to social desirability- The participants might not report their feelings and true experiences due to "social desirability" – the desire to portray themselves in a favourable way to the interviewer.

B. Limitations relating to the researcher's involvement
The researcher developed and instructed the FORCE program. This limitation was decreased by using external examiners who tested physical capability tests.

C. Limitations relating to generalization- In order to raise the level of generalization of research findings, triangulation was used as a strategy that increased validity and strength of the findings, in order to obtain significant conclusions in the study.

VII.5. Contribution to Knowledge

The study was carried out in order to fill the gap in knowledge relating to promoting quality of life among third and fourth age adults. This section relates to the contribution of this research to knowledge – both applicable and theoretical.

VII.5.1 Contribution to Practical Knowledge

From a practical point of view, the findings of this research have important implications for developing education programs that promote quality of life in the third and fourth age. These findings provide practitioners with information relating to factors

associated with well-being and quality of life by integrating psycho-education with collaborative peer learning and experiential learning.

This is a group program that may be applied in any community framework that caters to people this age. Cognitive, mental, social and physical combination in the program due to team-based learning is of great importance. Programs intended for third and fourth agers should be group programs that allow discussion and sharing in the group, empowering thinking, creativity and self-learning skills, and promoting personal growth and social involvement.

Furthermore, the findings have important practical implications on the community level. Community entities should be convinced, following the findings of the study, to allocate resources for this age group and thus contribute to a more empathetic society that cares not only for life expectancy but also for quality of life at older ages. This is important for enhancing the social and family connection of people this age, who are still able to contribute to society instead of constituting a burden.
Since the needs of people this age are universal and exist globally, the research has further implications for similar population overseas and can be implemented in other countries and cultures.

VII.5.2 Contribution to Theoretical Knowledge

From a theoretical viewpoint, discussion of research findings led to development of a new conceptual framework relating to improving elderly quality of life.

Figure VII.12 presented the model that provides a visual description of the program components and its influence over four areas – cognitive, emotional, social and motor-physical development. Participation in the program led to learning (knowledge, comprehending the importance of physical and social activity, exercise) and increased experiences of achievement and success. The participants also felt they were taking part and contributing to research that promotes knowledge.

Figure No. VII.12 describes the conceptual framework that arises from the research findings.

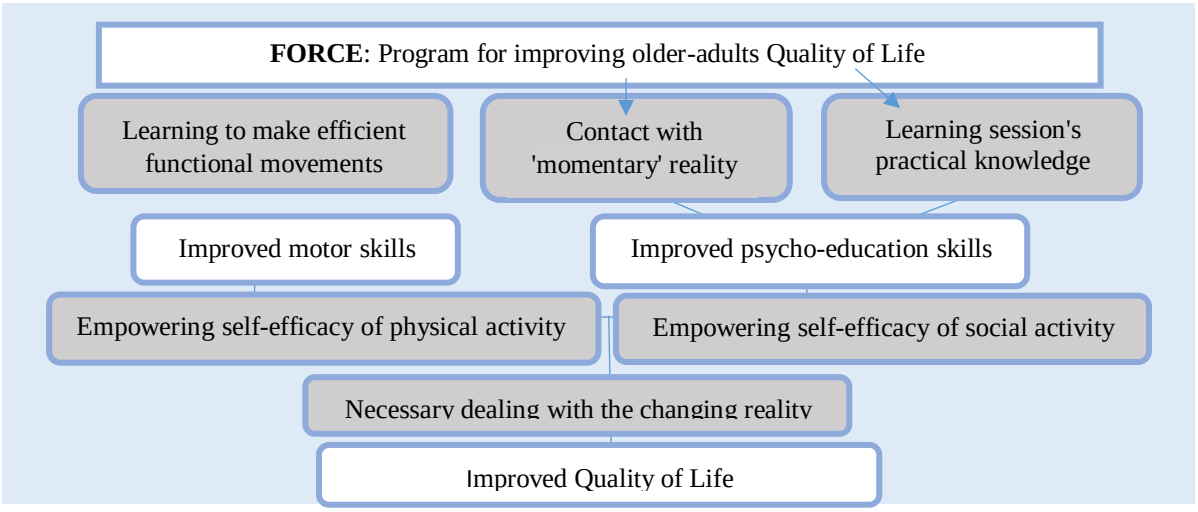

Figure No. VII.12. *Conceptual Framework: improved quality of life among elderly*

Another contribution to theoretical knowledge is that the research findings support the program's rationale relating to the capability for new learning at elderly ages that take place in a supportive group: the program participants learn and accumulate knowledge, wish to acquire new knowledge and refrain from adhering to prior patterns. They do not adhere to familiar and safe things, but want and enjoy innovation, change their habits and thus improve their quality of life. The program contributed to understanding that one can always change and make changes.

It seems that these research findings had further developed and conceptualized the components of Quality of Life of older adults.

This research about the FORCE intervention program represents a unique and innovative approach to health promotion with older adults. Its results hold the potential for developing new methods to substantially improve the health and well-being of this growing population, gain new and important insights into how older adults change their health-related behavior, contribute to an understanding of the impacts of multiple as compared with single-behavior interventions, and develop new methods of community-based recruitment

.

This is an example for application of the lifelong learning principles, possible at any age. The elderly person asks questions, locates sources of information, processes data and generates new information relevant for his personal world and life in the Age of Technology, the 21st century.

VII.6 Further Research

In view of the conclusions and limitations of the research, in order to expand possible contribution to knowledge, the following further research is recommended:

1. Further research that accompanies participants after they finish the program in order to examine continued improvement in their quality of life.
2. Additional teachers/trainers/instructors should be trained to support this program and continued research should be carried out with a more extensive research population both in Israel and in other countries in various social-economic surroundings.

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Appendix 1:

Research Participation Agreement

Dear participant,

My name is Rona Schwartzman Bar-Netzer, and I'm a PhD student in UBB univercity in Romania.

I'm doing a Research About**: "The Effect of Core Muscle Intervention Program on Improving Quality of Life in Older Adults through A Life Long Learning Program".**

Therefore, I would be happy and grateful if you could answer these questionnaires and be apart-of a study group, and participating in several quality of life- physical capability tests from your own will. You can quit participating in any time of the research.

The questionnaires are anonymous.

I (name): _____

ID: _____

Telephone number: _____

Signature: _____

Appendix 2:

Questionnaire for Collection of Demographic, Physical and Behavioral Information

PERSONAL INFORMATION	
First and last name	
I.D	
Date of birth	
Age	
Occupation	Active\ Seated\ Active and seated
Native language	
Speech language	
Country of Birth	
Ethnic origin	
Gender	Female\ Male
Dominant hand	
color blindness	Yes \ No
Marital Status	Married \ Single
Employment status	Pensioner \ volunteer \ still working for a living
Innovation of using technology	Yes \ No
Weekly physical activity	Hours per week:_____ hours.
	Inconsistent
	No activity at all
Falls per year	
Forgetfulness	Yes \ No
Smoking	Yes \ No
Joint pain (1-lowest; 5-highest) * If there is a different problem in a dual joint, please separate pain levels	Neck:
	Shoulders:
	Hip:
	Knees:
	Ankles:
	Wrists (palm of the hand):

Medicines and Diseases:

_____

_____

_____

_____

Appendix 3:

International Physical Activity Questionnaire (IPAQ)

INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the **last 7 days**. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the **vigorous** and **moderate** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal.

PART 1: JOB-RELATED PHYSICAL ACTIVITY

The first section is about your work. This includes paid jobs, farming, volunteer work, course work, and any other unpaid work that you did outside your home. Do not include unpaid work you might do around your home, like housework, yard work, general maintenance, and caring for your family. These are asked in Part 3.

1. Do you currently have a job or do any unpaid work outside your home?

☐ Yes

☐ No → ***Skip to PART 2: TRANSPORTATION***

The next questions are about all the physical activity you did in the **last 7 days** as part of your paid or unpaid work. This does not include traveling to and from work.

2. During the **last 7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, digging, heavy construction, or climbing up stairs **as part of your work**? Think about only those physical activities that you did for at least 10 minutes at a time.

_____ **days per week**

☐ No vigorous job-related physical activity → ***Skip to question 4***

3. How much time did you usually spend on one of those days doing **vigorous** physical activities as part of your work?

_____ **hours per day** _____ **minutes per day**

4. Again, think about only those physical activities that you did for at least 10 minutes at a time. During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads **as part of your work**? Please do not include walking.

_____ **days per week**

☐ No moderate job-related physical activity → ***Skip to question 6***

5. How much time did you usually spend on one of those days doing **moderate** physical activities as part of your work?

_____ **hours per day** _____ **minutes per day**

6. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time **as part of your work**? Please do not count any walking you did to travel to or from work.

_____ **days per week**

☐ No job-related walking → ***Skip to PART 2: TRANSPORTATION***

7. How much time did you usually spend on one of those days **walking** as part of your work?

_____ **hours per day** _____**minutes per day**

PART 2: TRANSPORTATION PHYSICAL ACTIVITY

These questions are about how you traveled from place to place, including to places like work, stores, movies, and so on.

8. During the **last 7 days**, on how many days did you **travel in a motor vehicle** like a train, bus, car, or tram?

_____ **days per week**

☐ No traveling in a motor vehicle → ***Skip to question 10***

9. How much time did you usually spend on one of those days **traveling** in a train, bus, car, tram, or other kind of motor vehicle?

_____ **hours per day** _____ **minutes per day**

Now think only about the **bicycling** and **walking** you might have done to travel to and from work, to do errands, or to go from place to place.

10. During the **last 7 days**, on how many days did you **bicycle** for at least 10 minutes at a time to go **from place to place**?

_____ **days per week**

☐ No bicycling from place to place → ***Skip to question 12***

11. How much time did you usually spend on one of those days to **bicycle** from place to place?

_____ **hours per day** _____**minutes per day**

12. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time to go **from place to place**?

_____ **days per week**

☐ No walking from place to place → ***Skip to PART 3: HOUSEWORK, HOUSE MAINTENANCE, AND CARING FOR FAMILY***

13. How much time did you usually spend on one of those days **walking** from place to place?

_____ **hours per day** _____ **minutes per day**

PART 3: HOUSEWORK, HOUSE MAINTENANCE, AND CARING FOR FAMILY

This section is about some of the physical activities you might have done in the **last 7 days** in and around your home, like housework, gardening, yard work, general maintenance work, and caring for your family.

14. Think about only those physical activities that you did for at least 10 minutes at a time. During the **last 7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, chopping wood, shoveling snow, or digging **in the garden or yard**?

_____ **days per week**

☐ No vigorous activity in garden or yard → ***Skip to question 16***

15. How much time did you usually spend on one of those days doing **vigorous** physical activities in the garden or yard?

_____ **hours per day** _____ **minutes per day**

16. Again, think about only those physical activities that you did for at least 10 minutes at a time. During the **last 7 days**, on how many days did you do **moderate** activities like carrying light loads, sweeping, washing windows, and raking **in the garden or yard**?

_____ **days per week**

☐ No moderate activity in garden or yard → ***Skip to question 18***

17. How much time did you usually spend on one of those days doing **moderate** physical activities in the garden or yard?

_____ **hours per day** _____ **minutes per day**

18. Once again, think about only those physical activities that you did for at least 10 minutes at a time. During the **last 7 days**, on how many days did you do **moderate** activities like carrying light loads, washing windows, scrubbing floors and sweeping **inside your home**?

_____ **days per week**

☐ No moderate activity inside home → ***Skip to PART 4: RECREATION, SPORT AND LEISURE-TIME PHYSICAL ACTIVITY***

19. How much time did you usually spend on one of those days doing **moderate** physical activities inside your home?

_____ **hours per day** _____ **minutes per day**

PART 4: RECREATION, SPORT, AND LEISURE-TIME PHYSICAL ACTIVITY

This section is about all the physical activities that you did in the **last 7 days** solely for recreation, sport, exercise or leisure. Please do not include any activities you have already mentioned.

20. Not counting any walking you have already mentioned, during the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time **in your leisure time**?

_____ **days per week**

☐ No walking in leisure time → ***Skip to question 22***

21. How much time did you usually spend on one of those days **walking** in your leisure time?

_____ **hours per day** _____ **minutes per day**

22. Think about only those physical activities that you did for at least 10 minutes at a time. During the **last 7 days**, on how many days did you do **vigorous** physical activities like aerobics, running, fast bicycling, or fast swimming **in your leisure time**?

_____ **days per week**

☐ No vigorous activity in leisure time → ***Skip to question 24***

23. How much time did you usually spend on one of those days doing **vigorous** physical activities in your leisure time?

_____ **hours per day** _____ **minutes per day**

24. Again, think about only those physical activities that you did for at least 10 minutes at a time. During the **last 7 days**, on how many days did you do **moderate** physical activities like bicycling at a regular pace, swimming at a regular pace, and doubles tennis **in your leisure time**?

_____ **days per week**

☐ No moderate activity in leisure time → ***Skip to PART 5: TIME SPENT SITTING***

25. How much time did you usually spend on one of those days doing **moderate** physical activities in your leisure time?

_____ **hours per day** _____ **minutes per day**

PART 5: TIME SPENT SITTING

The last questions are about the time you spend sitting while at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading or sitting or lying down to watch television. Do not include any time spent sitting in a motor vehicle that you have already told me about.

26. During the **last 7 days**, how much time did you usually spend **sitting** on a **weekday**?

_____ **hours per day** _____ **minutes per day**

27. During the **last 7 days**, how much time did you usually spend **sitting** on a **weekend day**?

_____ **hours per day** _____ **minutes per day**

This is the end of the questionnaire, thank you for participating.

APPENDIX 4:

Instrumental Activities Daily Living (IADL)

A. Ability to use telephone

1. Operates telephone on own initiative; looks up and dials numbers, etc. 1
2. Dials a few well-known numbers 1
3. Answers telephone but does not dial 1
4. Does not use telephone at all 0

B. Shopping

1. Takes care of all shopping needs independently 1
2. Shops independently for small purchases 0
3. Needs to be accompanied on any shopping trip 0
4. Completely unable to shop 0

C. Food Preparation

1. Plans, prepares and serves adequate meals independently 1
2. Prepares adequate meals if supplied with ingredients 0
3. Heats, serves and prepares meals or prepares meals but does not maintain adequate diet 0
4. Needs to have meals prepared and served 0

D. Housekeeping

1. Maintains house alone or with occasional assistance (e.g. "heavy work domestic help") 1
2. Performs light daily tasks such as dish- washing, bed making 1
3. Performs light daily tasks but cannot maintain acceptable level of cleanliness 1
4. Needs help with all home maintenance tasks 1
5. Does not participate in any housekeeping tasks 0

E. Laundry

1. Does personal laundry completely 1
2. Launders small items; rinses stockings, etc. 1
3. All laundry must be done by others 0

F. Mode of Transportation

1. Travels independently on public transportation or drives own car 1
2. Arranges own travel via taxi, but does not otherwise use public transportation 1
3. Travels on public transportation when accompanied by another 1
4. Travel limited to taxi or automobile with assistance of another 0
5. Does not travel at all 0

G. Responsibility for own medications

1. Is responsible for taking medication in correct dosages at correct time 1
2. Takes responsibility if medication is prepared in advance in separate dosage 0
3. Is not capable of dispensing own medication 0

H. Ability to Handle Finances

1. Manages financial matters independently (budgets, writes checks, pays rent, bills goes to bank), collects and keeps track of income 1
2. Manages day-to-day purchases, but needs help with banking, major purchases, etc. 0
3. Incapable if handling money 0

Source: Lawton, M.P., and Brody, E.M. "Assessment of older people: Self-maintaining and instrumental activities of daily living." Gerontologist 9:179-186, (1969).

APPENDIX 5:

Quality of Life Questionnaire (SF-36)

Choose one option for each questionnaire item.

1. In general, would you say your health is:

○ 1 - Excellent ○ 2 - Very good ○ 3 - Good ○ 4 - Fair ○ 5 - Poor

2. **Compared to one year ago**, how would you rate your health in general **now**?

○ 1 - Much better now than one year ago ○ 2 - Somewhat better now than one year ago ○ 3 - About the same ○ 4 - Somewhat worse now than one year ago
○ 5 - Much worse now than one year ago

The following items are about activities you might do during a typical day. Does **your health now limit you** in these activities? If so, how much?

	Yes, limited a lot	Yes, limited a little	No, not limited at all
3. **Vigorous activities**, such as running, lifting heavy objects, participating in strenuous sports	○ 1	○ 2	○ 3
4. **Moderate activities**, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	○ 1	○ 2	○ 3
5. Lifting or carrying groceries	○ 1	○ 2	○ 3
6. Climbing **several** flights of stairs	○ 1	○ 2	○ 3
7. Climbing **one** flight of stairs	○ 1	○ 2	○ 3
8. Bending, kneeling, or stooping	○ 1	○ 2	○ 3
9. Walking **more than a mile**	○ 1	○ 2	○ 3
10. Walking **several blocks**	○ 1	○ 2	○ 3
11. Walking **one block**	○ 1	○ 2	○ 3
12. Bathing or dressing yourself	○ 1	○ 2	○ 3

During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities **as a result of your physical health**?

	Yes	No
13. Cut down the **amount of time** you spent on work or other activities	○ 1	○ 2
14. **Accomplished less** than you would like	○ 1	○ 2

	Yes	No
15. Were limited in the **kind** of work or other activities	○ 1	○ 2
16. Had **difficulty** performing the work or other activities (for example, it took extra effort)	○ 1	○ 2

During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities **as a result of any emotional problems** (such as feeling depressed or anxious)?

	Yes	No
17. Cut down the **amount of time** you spent on work or other activities	○ 1	○ 2
18. **Accomplished less** than you would like	○ 1	○ 2
19. Didn't do work or other activities as **carefully** as usual	○ 1	○ 2

20. During the **past 4 weeks**, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

○ 1 - Not at all ○ 2 - Slightly ○ 3 - Moderately ○ 4 - Quite a bit ○ 5 - Extremely

21. How much **bodily** pain have you had during the **past 4 weeks**?

○ 1 - None ○ 2 - Very mild ○ 3 - Mild ○ 4 - Moderate ○ 5 - Severe
○ 6 - Very severe

22. During the **past 4 weeks**, how much did **pain** interfere with your normal work (including both work outside the home and housework)?

○ 1 - Not at all ○ 2 - A little bit ○ 3 – Moderately
○ 4 - Quite a bit ○ 5 - Extremely

These questions are about how you feel and how things have been with you **during the past 4 weeks**. For each question, please give the one answer that comes closest to the way you have been feeling.

How much of the time during the **past 4 weeks**...

	All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
23. Did you feel full of pep?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
24. Have you been a very nervous person?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6

	All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
25. Have you felt so down in the dumps that nothing could cheer you up?	1	2	3	4	5	6
26. Have you felt calm and peaceful?	1	2	3	4	5	6
27. Did you have a lot of energy?	1	2	3	4	5	6
28. Have you felt downhearted and blue?	1	2	3	4	5	6
29. Did you feel worn out?	1	2	3	4	5	6
30. Have you been a happy person?	1	2	3	4	5	6
31. Did you feel tired?	1	2	3	4	5	6

32. During the **past 4 weeks**, how much of the time has **your physical health or emotional problems** interfered with your social activities (like visiting with friends, relatives, etc.)?

1 - All of the time 2 - Most of the time 3 - Some of the time

4 - A little of the time 5 - None of the time

How TRUE or FALSE is **each** of the following statements for you.

	Definitely true	Mostly true	Don't know	Mostly false	Definitely false
33. I seem to get sick a little easier than other people	1	2	3	4	5
34. I am as healthy as anybody I know	1	2	3	4	5
35. I expect my health to get worse	1	2	3	4	5
36. My health is excellent	1	2	3	4	5

APPENDIX 6:

Self-Efficacy of Physical Activity and Social Activity

Questionnaire

Part I: Physical Activity Self-Efficacy Measure (Resnick, Palmer, Jenkins, & Spellbring, 2000).

How confident are you that you could participate in a physical activity (e.g., exercise classes, swimming, or walking as an exercise) for 20 min three times per week if

Measure	1	2	3	4	5	6	7	8	9	10
1. The weather was bothering you										
2. You were bored by the activity										
3. You felt pain when participating										
4. You had to participate alone										
5. You did not enjoy it										
6. You were too busy with other activities										
7. You felt tired										
8. You felt stressed										
9. You felt depressed										

Respondents were instructed to choose a number between 1 (*I am NOT very confident*) and 10 (*I am very confident*).

Part II: Physical Activity Outcome Expectancy Measure *Perkins, J. M., Multhaup, K. S., Perkins, H. W., Barton, C., 2008).*

The major benefits of physical activity are

Measure	1	2	3	4	5
1. Stay in shape					
2. Make me feel better in general					
3. Good health					
4. Maintain proper body weight					
5. Improve appearance					
6. Enhancing self-image and confidence					
7. Positive psychological effect					
8. Reduce stress and relax					

9. Fun and enjoyment						
10. Help cope with life's pressures						
11. Lose weight						
12. Companionship						
13. Contribute to keeping health care costs down for society						
14. Motivate others						
15. Stay available to friends						
16. Stay available to family						
17. Support others						
18. Set example for peers						
19. Maintain independence so I am less of a burden						
20. Meet others' expectations of me						
21. Fulfillment of society's expectations that I should try to stay healthy						
22. Set example for children and grandchildren						
23. Contribute to keeping health care costs down for family						
24. Remain contributing member of society						

Respondents were instructed to choose a number between 1 (*strongly disagree*) and 5 (*strongly agree*).

Part III: Social Activity Self-Efficacy Measure (*Perkins, J. M., Multhaup, K. S., Perkins, H. W., Barton, C., 2008*).

How confident are you that you could participate in a social activity (e.g., gathering for coffee, meeting in a park to chat, going shopping with friends or family) three times per week if:

Measure	1	2	3	4	5	6	7	8	9	10
1. The weather was bothering you										
2. You were bored by the activity										

3. You felt pain when participating										
4. You felt lonely within this group										
5. You did not enjoy it										
6. You were too busy with other activities										
7. You felt tired										
8. You felt stressed										
9. You felt depressed										

Respondents were instructed to choose a number between 1 (*I am NOT very confident*) and 10 (*I am very confident*).

Part IV: Social Activity Outcome Expectancy Measure (*Perkins, J. M., Multhaup, K. S., Perkins, H. W., Barton, C., 2008*).

The major benefits of social activity are

Measure	1	2	3	4	5
1. Stay connected with other people					
2. Make me feel better in general					
3. Good health					
4. Maintain relationships					
5. Improve attractiveness					
6. Enhancing self-image and confidence					
7. Positive psychological effect					
8. Reduce stress and relax					
9. Fun and enjoyment					
10. Help cope with life's pressures					
11. Reduce negative moods/reduce loneliness[a]					
12. Companionship					

Respondents were instructed to choose a number between 1 (*strongly disagree*) and 5 (*strongly agree*).

Appendix 7:

Questionnaire Regarding Use of Accessories for Strengthening Core Muscles (daily use hours/minutes)

Where was it used	**Stability cushion**	**overball**	**Fascia balls**
Watching TV	**Minutes_____** **Hour_____**	**Minutes_____** **Hour_____**	**Minutes_____** **Hour_____**
In bed	**Minutes_____** **Hour_____**	**Minutes_____** **Hour_____**	**Minutes_____** **Hour_____**
Elsewhere	**Minutes_____** **Hour_____**	**Minutes_____** **Hour_____**	**Minutes_____** **Hour_____**

APPENDIX 8:

Interviews' questions with CMI Participant

1. **Which activities have become easier (lifting weights, arranging closet, gardening, housekeeping, playing with grandchildren etc.) and/or which activities did you add or infer (walking faster)?**
2. **Do you feel physically better during lessons?**
3. **Score the improvement in aching joints after taking part in the research program please**
4. **Are you dedicating more time for training activities?**
5. **Can you specify more details about the physical changing that improve you daily activity or anything that upgrade your QOL?**
6. **In what ways do you feel the difference?**
7. **Do you feel physical change in the motivation for everyday use of home accessories, e.g. stability cushion\ overball?**
8. **Has physical awareness increased the will to change everyday habits due to the classes?**
9. **How do you define your feelings about the program you are part of?**
10. **What do you think the cause for it? Can you put your finger or point it on something?**
11. **Do you feel a difference in the will, perseverance and motivation to attend lessons?**
12. **Do you feel improvement in recalling emphasis and importance of decreased damages in the lesson or everyday physical activity or training?**
13. **Do you feel improvement or retaining physical shape gave you will and motivation to engage in more physical activity during the week?**
14. **In your everyday life, with what do you feel reach from the study?**
15. **Do you want to share anything else with what you inform of the study?**