Asian Journal of Health Psychology

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Overview

Health psychology is a special area of psychology that focused mainly on how all facets of lives impact the physical health. Health psychology aimed to study on psychological /behavioral processes in health, illness, and health care fields, Concerned with understanding how psychological, behavioral, and cultural factors contribute to physical health and illness.

Due to the important role that Health psychology plays in social security and the necessity of applying it in individuals’ lives, Asian journal of Health psychology as an academic journal devoted to understanding the scientific relations among psychological factors, behaviors and physical health & illness. This readership is broad with respect to discipline, background, interests, and specializations. This journal is published by Iran health psychology society. Site: www.healthpsychology.ir. And also supported by Iran Open University (PNU) publication. Site: www.pnu.ac.ir

In the other hand, our journal mainly emphasis on original researches, including integrative theoretical review papers, meta-analyses, treatment outcome trials, and brief scientific reports. Scholarly case studies, commentaries, and letters to the editor will also be considered.

Papers should have significant theoretical or practical importance for understanding relations among psychological factors and physical health as well as their application. All papers should also consider the translation of scientific findings for practice and policy.

Aims and Scope

Asian journal of Health psychology publishes original scholarly articles on topics such as:

- Lifespan approaches to health, including those related to older adults
- Evaluation and dissemination of treatment approaches that target the individual, family, group, multicenter, or community level.
- Ethnicity, social class, gender, sexual, orientation in health.
- Health disparities.
- Research methodology, measurement, and statistics in health psychology.
- Implications of research findings for health-related policy.
- Advances in health-related theories.
- Innovations in technology related to health psychology
- Professional issues in health psychology, including training and supervision.

Experimental and clinical research on etiology

- Management of acute and chronic illness
- Responses to ill-health
- Screening and medical procedures
- Psychological mediators of health-behaviors
- Influence of emotion of health and health-related behaviors
- Psychological processes relevant to disease outcomes
- Psychological interventions in health and disease
- Emotional and behavioral responses to ill health, screening, and medical procedures
- Psychological aspects of prevention.

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July 2016
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Submit manuscripts electronically (.rtf, PDF, or .doc)

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The page limit for research manuscripts, reviews, and meta-analyses is 7-10 pages. The page limit is inclusive of all parts of the manuscript, including the cover page, abstract, text, references, tables, and figures.

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Brief reports are acceptable for innovative work that may be premature for publication as a full research report because of small sample size, novel methodologies, etc. Brief reports should be designated as such and should not exceed a total of 7-10 pages, inclusive of all parts of the manuscript, including the cover page, abstract, text, references, tables, and figures.

The manuscript should be typed using Word format and adhere to the APA style. It should be typed double-spaced, using font 12 of Times New Roman with a margin of at least 1 inch on all sides. The page number should appear in centre position at the bottom of the page.

On the submission portal you will be asked to provide contact information for three individuals who are qualified to serve as unbiased reviewers for your paper. These people must have published peer reviewed work in a relevant field. They must be without any real or perceived conflict of interest with you and your co-authors. They cannot be at the same institution as any author, cannot be a co-author on any recent publications, and must not be a former or current trainee, advisor or mentor, etc.

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The cover letter should indicate that the authors have read and followed the Asian Journal of Health Psychology Instructions for Authors. It should also include a statement indicating that the paper has been seen and approved by all authors. The cover letter should describe how the paper advances research in health psychology, referring to the journal mission to assure that the submission fits with the scope of papers published in Health Psychology.

The full mailing address, telephone, fax, and email address for the corresponding author should be included in the cover letter and title page, along with the names and affiliations of all co-author/s.
The cover letter must confirm that the manuscript has not been published, is not currently submitted elsewhere, and that it does not contain data that is currently submitted or published elsewhere.

When a manuscript contains data that is part of a larger study, authors should describe the larger study and provide references for other study papers. Authors must be prepared to provide copies of related manuscripts when requested as part of the editorial review process. Authors should clarify the relationship between their paper, including detailed specification of the overlap in participants, measures, and analysis, and others from the study. The value-added scientific contribution of their study must be clearly stated in the cover letter.

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The manuscript **title** should be accurate, fully explanatory, and no longer than 12 words, of course, without additional letters. The title should reflect the content and population studied, and it should not be in the form of an assertion or conclusion. If the paper reports a randomized clinical trial, this should be indicated in the title. The title of brief reports should start with the words “Brief Report”. The title page should include the names of all authors and their affiliations at the time the research was done.

All research manuscripts must include a structured abstract containing a maximum of 250 words with the following sections:

- Objective (brief statement of the purpose of the study);
- Methods (summary of the participants, design, measures, procedure);
- Results (primary findings); and
- Conclusions (specific statement of the implications of the data).

supply up to five keywords or brief phrases after the abstract. We recommend that you choose medical subject headings (MeSH) and/or psychological index terms for your keywords. The National Library of Medicine offers a free, searchable MeSH database for PubMed.

The **Introduction** should not exceed 2-3 pages in length. The paper should be referenced appropriately but excessive citations should be avoided.

All research involving human participants must describe oversight of the research process by the relevant Institutional Review Boards and should describe consent and assent procedures briefly in the Methods section.

All statistical tests should include an effect size with confidence intervals whenever possible.

**First person language («I», «we») should be avoided.** Terminology should be sensitive to the individual who has a disease or disability. The journal endorses the concept of «people first, not their disability.» Terminology should reflect the «person with a disability» (e.g., children with diabetes, persons with HIV infection, families of people with cancer) rather than the condition as an adjective (e.g., diabetic children, HIV patients, cancer families.

It is important to highlight the significance and novel contribution of original work. Replications and extensions of previous studies are welcome, but the rationale and discussion should give due weight to the main purpose of the study (i.e., to confirm, disconfirm, or extend previous research), and it should not give excessive weight to minor innovations or superficially novel features.

**Manuscript Preparation:**

Prepare manuscripts according to the **Publication Manual of the American Psychological Association** (6th edition). Other formatting instructions, as well as instructions on preparing tables, figures, references, metrics, and abstracts, appear in the **Manual**. Additional guidance on APA Style is available on the
APA Style website.

Review APA’s Checklist for Manuscript Submission before submitting your article. Manuscripts may be copyedited for bias-free language (see Chapter * of the Publication Manual).

Below are additional instructions regarding the preparation of display equations, computer code, and tables.

**Tables**

Use Word’s Insert Table function when you create tables (1 to 2 tables allowed). Using spaces or tabs in your table will create problems when the table is typeset and may result in errors.

**Figures**

Graphics files are welcome if supplied as Tiff or EPS files. Multi panel figures (i.e., figures with parts labeled a, b, c, d, etc.) should be assembled into one file.

The minimum line weight for line art is 0.5 point for optimal printing.

For more information about acceptable resolutions, fonts, sizing, and other figure issues, please see the general guidelines.

When possible, please place symbol legends below the figure instead of to the side.

**References**

List references in alphabetical order. Each listed reference should be cited in text, and each text citation should be listed in the References section.

Examples of basic reference formats:


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Abstract
The purpose of the present study is to examine the relationship between psychological factors, Erectile Dysfunctional (ED), and quality of life (QOL) before and after Coronary Artery Bypass Graft (CABG) and Percutaneous Transluminal Coronary Angioplasty (PTCA) procedures among Iranian cardiovascular patients. To do so, one hundred ninety patients, scheduled for CABG and PTCA operations, were selected and administered relevant questionnaires a day before the surgery. Subsequently, the same patients filled out the same questionnaires two months after the procedure. Data analysis showed an increase in Qol, while revealing a decline in sexual functioning among men and no change in women after the PTCA procedure. Also, the results showed an improvement in psychological status of all patients following both revascularization procedures.

Key Words: Revascularization; Quality of Life; Erectile Dysfunction, Psychological Status

Introduction
People with coronary artery diseases (CAD) suffer from angina, shortness of breath, fatigue and dizziness with or without the onset of physical activity, and a diminished ability to perform their daily activities. There are safe and effective methods used in the treatment of coronary artery disease are Coronary Artery Bypass Grafting (CABG) and Percutaneous Transluminal Coronary Angioplasty (PTCA). The CABG is a procedure that not only diminishes the negative effects of coronary artery disease and reduces the risk of further damage to the heart (i.e. myocardial infarction or congestive heart failure), but also improves patient’s health related quality of life (QoL). The PTCA is also a beneficial procedure to alleviate symptoms resulting from coronary artery blockage. In this procedure, special tubing with an attached deflated balloon is threaded up to the coronary arteries. The balloon is then inflated in order to enlarge areas where blood flow to the heart muscle has been blocked or reduced. Similar to the CABG, quality of life has also been reported to improve following PTCA procedure (Blankenship et al., 2012).

Although a number of studies have reported that patients’ health-related quality of life improve after CABG (Thomson, Niven, Peck, & Eaves, 2013) and
PTCA (Levine et al., 2011), operated patients report array of psychiatric disorders, namely depression, anxiety, cognitive functions, and sleep disorders, as well as experiencing many physical problems and relative disabilities such as erectile dysfunction (ED) (Schumann, Zellweger, Di Valentino, Piazzalunga, & Hoffmann, 2010; Karkos et al., 2004). For example, Pignai-Damaria et al. (2003) have equated the importance of the effects of such disorders on the cardiovascular system to those of patients smoking and hypertension, thus, stressing the need for their early detection and treatment. They have also pointed out that these psychological disorders can exacerbate treatment outcomes following an intervention treatment procedure which lead to a marked decrease in quality of life.

In addition to psychiatric disorders, CABG and PTCA may impact cognitive functioning. For example, Bergh et al. (2002) have reported that patients, undergoing the CABG and PTCA treatment, experience significant deterioration in memory one to two years following the operation. Moreover, Ahlgren, Lundqvist, Nordlund, Aren, and Rutberg (2003), in a study to evaluate and compare neurocognitive function and driving performance after CABG and PTCA, concluded that although a decline in cognitive functioning was evident in both groups, it was more severe in the CABG group than in the PTCA group.

Another problem associated with CABG and PTCA procedures is the development of sleep disturbances. Fernandes et al. (2014), for example, in a study of patients successfully undergone percutaneous coronary intervention (PCI), reported sleep disturbances. Also, Gustafsson and Hetta (2002) have shown patients undergone PTCA, one year after the procedure, exhibited fragmented sleep because of psycho-physiological symptoms associated with this procedure. Obviously lack of sleep or poor sleep quality can cause great emotional distress and reduce energy in cardiac patients undergone various revascularization procedures, and can significantly impede their recuperation process which ultimately decreases their QoL.

As mentioned before, one physical problem that can develop following treatment intervention procedures is ED. By Definition, the inability to achieve or maintain an erection required for satisfactory sexual performance is called Erectile Dysfunction (Rosen, 2001). Psychogenic factors that cause ED include anxiety and depression, among others. For instance, Altof (2002) has reported that ED is strongly associated with anxiety, depression, marital conflicts and relationship problems. Laumann et al. (1999) have also noted that health status, stress, life satisfaction, deterioration of general health and emotional functions are strongly correlated with sexual dysfunction. Furthermore, Idung, Abasiubong, Udoh and Akinbami (2012) have concluded that social relationship and psychosocial well-being and domains of QoL of men with ED are particularly impaired (Tsai, Chang, & Hwang, 2008; Litwin, Li, & Bridge, 1998). As such, ED is considered a major quality of life (QoL) issue, and indeed, a major health indicator, particularly in individuals with cardiac problems.

The results of studies examining the impact of treatment intervention procedures on ED are contradictory. For example, Akbulut et al. (2008) reported that following CABG operation, ED improves, thereby; enhancing quality of life of the afflicted patients suggesting that ED is an essential component of QoL and that coronary artery bypass surgery can have considerable influence on erectile function. Similarly, Heaton, Evans, Adams, Smith and Morales (1996) have cited significant improvement following CABG. On the other hand, Foruzan-Nia, Abdollahi, Hekmatimoghaddam, Namayandeh,
and Mortazavi (2011) have reported that the rate of sexual dysfunction increases from 20.1% prior to the surgery to 76.4% after the procedure. Therefore, it appears that CABG procedures do not necessarily enhance ED and that other factors are involved in the enhancement of ED after the operation.

Reports are also contradictory and scant regarding the effects of PTCA on ED. In one study, Karkos et al. (2004) showed that none of the patients undergone PTCA developed ED. Yet, the results of another study indicated that 64% of the patients, eight years after undergoing PTCA, experienced more satisfaction with their sexual functioning than before the procedure (Lukarinen & Lukarinen, 2007). Therefore, no clear and concrete conclusion can be drawn about the effects of this procedure and its ensuing effects on ED.

Because of the false perception of cardiac surgery being a life threatening procedure, a great deal of stress and anxiety can develop before and after the intervention. For example, Chadhury, Sharma, and Pawar (2006) have reported a high prevalence of anxiety and depression in patients undergoing CABG, both before and after surgery. Furthermore, Rymaszewska, Tulczynski, Zagrobelny, Kiejna, and Hadryś (2003) have noted high levels of depression and state trait anxiety before the CABG that appear to be predictors of postoperative psychological outcome. Additionally, Kranich et al. (2007) have found different levels of anxiety and depression before and after CABG depending on the age of patient.

Similar reports have also been made regarding the PTCA procedure. Specifically, Zhao, Lou, Wang and Sue (2008) have reported high prevalence of anxiety and depression rates in patients undergoing PCI, compared to the general population. They maintain that the reduction in anxiety and depression levels from pre to post PCI indicates that patients are under tremendous psychological strain before PCI. Also, Austin, Jones and Thompson (2005) have stressed the need for measuring anxiety and depression following the PTCA intervention given that preoperative anxiety and depression can negatively influence postoperative recovery.

Regarding the assessment of psychological status and the QoL of patients before and after CABG and PTCA, data is very scarce. In this regard, only one study was found in which QOL, mood state, and physical functioning of patients were compared in both groups of pre and post operated. In this study, Papadonaki, Stotts, and Paul (1994) reported that mood state and physical functioning were improved following both procedures, while QoL was similar in both groups before the operation and did not change after both procedures.

Insum, cardiac patients requiring revascularization procedures tend to perceive these procedures as a life threatening event that can cause a great deal of psychological burden on them. These problems are closely tied into other aspects of their lives such as ED which is a major health indicator and is considered a major element of QoL. As such, the present study attempts to address the interrelationship between psychological factors, ED, and QoL, before and after CABG and PTCA procedures, among Iranian samples of cardiovascular patients. To this end, the following questions will be addressed:

- What is the relationship between psychological factors and QoL in patients undergone CABG and PTCA before and after the surgery?

- Are there any gender differences in sexual functioning before and after CABG and PTCA?

- What is the psychological status of men and women before and after CABG and PTCA?
METHODS

Participants

The average age of participants was 60.45 (± 3.4) years old. One hundred eighty patients who referred to Baquiatallah and Tehran Heart Center hospitals for CABG and PTCA operations were randomly selected. Criteria for entering the study included: (1) CAD treated with elective CABG or PTCA, (2) age less than 70 years old, and (3) ability to fill out questionnaire. Following preliminary stages of admission to the hospital and obtaining patients’ informed written consent, patients in CABG (n=90) and PTCA (n=90) groups were administered relevant questionnaires one day prior to their surgeries. Specifically, during the pre-test period patients were asked to answer relevant questionnaires to assess anxiety, depression and stress (DASS-21), QOL (Short Form of Health Survey, (SF-36), ED in women (Female Sexual Function Index (FSFI), and ED in men (IIEF). The same procedure was repeated, with the same patients, two months after the surgery. Eventually, data were obtained from a total of one hundred-fifty subjects. Specifically, in the CAGB group, one subject died, five patients had post-operation complication (stroke) and ten did not return questionnaires (n=74). Similarly, in the PTCA group, three patients had unsuccessful procedures, eight did not return questionnaires, and three opted to discontinue their participation (n=76).

Statistical Analysis

Statistical analyses were performed by SPSS version 18.0 (SPSS, Chicago, IL, USA). Data were analysed using Pearson’s correlation and paired sample t-test.

Assessment

Assessment of QoL: QoL was assessed by means of the Short Form Health Survey (SF-36) questionnaire, which is a reliable and valid instrument for assessment of QOL in older people. The SF-36 includes 8 subscales namely: physical functioning (PF), role physical (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role emotional (RE), and mental health (MH). Scores range from 0 to 100 for each subscale with higher scores indicating a better condition. The questionnaire was normalized in Iran by Montazeri, Goshtasebi, Vahdaninia, & Gandek (2005) and its Test-retest correlation coefficient (with an interval of 14 days) was significant with r= 0.76 and P=0.0006.

Assessment of Erectile Dysfunction in Men: To assess men’s erectile dysfunction, the abridged form of The International Index of Erectile Function (IIEF-5) questionnaire, a multi-dimensional self-report ordinal instrument, where lower values indicate lower sexual function, was used. Reliability of this questionnaire in the present population was obtained using a test-retest procedure within a 30-day time interval. The Cronbach’s alpha was 0.82 which is indicative of its high reliability. The subjects’ ED was measured and categorized according to severity based on their IIEF score: severe dysfunction (score 5-10); mild to moderate dysfunction (score 11-15); mild dysfunction (score 16-20); and no dysfunction (score 21-25).

Assessment of Sexual Dysfunction in Women: To assess female sexual dysfunction, the scale of FSFI was used. This is a brief questionnaire designed to measure sexual functioning in women with a specific focus on sexual arousal, orgasm, satisfaction, and pain. The questionnaire, assessing sexual functioning with 19 questions, consists of six sexual domains; sexual desire (questions 1 and 2), arousal (questions 3–6), lubrication (questions 7–10), orgasm (questions...
11–13), satisfaction (questions 14–16) and degree of pain (questions 17–19) during intercourse. For each six domains, a score is calculated and the total score is obtained by adding the six domain scores. The validity of each six domain, sexual desire, arousal, lubrication, orgasm, satisfaction and degree of pain, was assessed in an Iranian population, which were 0.7, 0.9, 0.9, 0.91, 0.76 and 0.88, respectively (Mohammadi, Heydari, & Faghihzadeh, 2008). The Cronbach’s alpha was reported as 0.85 which is indicative of its high reliability. The total score range is 2–36. A total score of more that 25 is considered normal female sexual function and a total score of less than 25 is considered sexual dysfunction.

Assessment of Anxiety, Depression and Stress: The Depression Anxiety Stress Scale - DASS-21 (Lovibond & Lovibond, 1995) is a 21-item self-report measure that provides continuous scores on three subscales of depression, anxiety, and stress, recorded for the past week. Items are scored from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time). High levels of severity on this measure are indicated by scores of 20, 14 and 26 or greater for depression, anxiety and stress, respectively. In the development of the measure, individual scales yielded Cronbach’s alphas of 0.94, 0.87 and 0.91 for depression, anxiety and stress respectively.

All questionnaires used in the present study were translated from English into Persian and, subsequently, back-translated into Persian by an expert in the field who had a good command of the English language. As such, their validity and reliability were measured and were found to be adequate for use in our population.

To assess normality of data Kolmogorov Smirnov test was used.

RESULTS

Table 1 illustrates the correlation between quality of life and stress before and after PTCA and CABG procedures. As shown, the correlation coefficient scores before and after the PTCA (rb =-0.8; ra= -0.56) were transformed to Fisher’s z score in order to compare stress and Qol, before and after the surgery. Results showed an inverse significant relationship between stress and Qol given that the obtained z score (z= -2.67) is greater than 1.96 (p<0.05, z= 1.96) indicating that decreasing stress following PTCA causes an improvement in Qol. No significant relationship between anxiety and depression and Qol was evident in this group. Regarding the CABG, no significant relationship between psychological factors and Qol was observed.

Table 2 illustrates the comparison of mean scores of sexual functioning of men and women before and after CABG and PTCA procedures. Results of a paired t-test indicate a significant difference (p<0.05) in the mean scores of men’s sexual functioning before and after PTCA, while no significant difference was shown in women’s sexual functioning. Regarding the CABG, no significant difference in the mean scores of men’s and women’s sexual functioning was observed.

Table 3 illustrates psychological status of men and women before and after CABG surgery. A
paired sample t-test was performed to determine the difference in the mean scores of psychological factors before and after surgery. According to this table, significant differences (p<0.05) were observed in men and women in all psychological factors prior to and following the surgery.

Table 4 illustrates psychological status of men and women before and after PTCA surgery. A paired sample t-test was used to determine the difference in the mean scores of psychological factors before and after surgery. According to the table, significant differences (p<0.05) were observed in men and women in all psychological factors prior to and following the surgery.

Table 4. Psychological status of men and women before and after PTCA surgery

<table>
<thead>
<tr>
<th>Gender</th>
<th>Men</th>
<th>Women</th>
<th>Variables</th>
<th>Before</th>
<th>After</th>
<th>Before</th>
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<tr>
<td></td>
<td>Mean</td>
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<td>Mean</td>
<td>SD</td>
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<tr>
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<td>5.07</td>
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<td>3.84*</td>
<td>15.03</td>
<td>5.21</td>
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<tr>
<td>Anxiety</td>
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<td>3.84</td>
<td>8.20</td>
<td>3.25*</td>
<td>11.06</td>
<td>3.62</td>
<td>7.19</td>
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<tr>
<td>Depression</td>
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<td>5.10</td>
<td>9.70</td>
<td>4.23*</td>
<td>11.48</td>
<td>4.90</td>
<td>8.87</td>
</tr>
</tbody>
</table>

Post-surgery mean values were significantly different from those of Pre-surgery (paired-samples t test): *P>.05

Table 2. Comparison of sexual functioning of men and women before and after CABG and PTCA procedures

<table>
<thead>
<tr>
<th>Group</th>
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<tr>
<td></td>
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</tr>
<tr>
<td>Men</td>
<td>14.10</td>
<td>5.44</td>
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<tr>
<td>Women</td>
<td>18.06</td>
<td>6.92</td>
<td>17.98</td>
<td>5.72</td>
</tr>
</tbody>
</table>

Post-surgery mean values were significantly different from those of Pre-surgery (paired-samples t test): *P>.05

Table 3. Psychological status of men and women before and after CABG surgery

<table>
<thead>
<tr>
<th>Gender</th>
<th>Men</th>
<th>Women</th>
<th>Variables</th>
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<th>Before</th>
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<tr>
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<td>5.25</td>
<td>10.50</td>
<td>4.91*</td>
<td>15.16</td>
<td>5.36</td>
<td>10.50</td>
</tr>
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</table>

Post-surgery mean values were significantly different from those of Pre-surgery (paired-samples t test): *P<.05
DISCUSSION

The findings of the present study showed a significant increase in QoL due to a reduction in stress following the PTCA surgery. Also, our results showed a decline in sexual functioning among men after PTCA procedure, while staying the same in women. Furthermore, in terms of psychological factors such as depression, anxiety and stress, our results showed that following both revascularization procedures, they were all reduced in both men and women.

The fact that QoL was increased as a result of a decrease in stress following successful PTCA is consistent with the findings of Blankenship et al. (2012) that reported an improvement of QoL following PTCA. One explanation for this finding is that the reduction of stress after PTCA could be due to the false perception of this type of surgery as being a life threatening procedure. Specifically, patients, at first, might have had a frightening view of the procedure and following the surgery they came to know about the less invasive nature of it compared to that of CABG’s, which led to the decline of their stress.

Regarding the sexual functioning of patients, our results indicated that men’s sexual functioning worsened after PTCA, while not changing after CABG, whereas in women there were no changes after either procedures. The fact that worsening of sexual functioning was observed in men after PTCA is supported by the findings Karkos (2004) that noted the deterioration of sexual functioning following open and endovascular procedures. Wahrborg (1998) also found no difference in the sex life of patients undergone PTCA. One explanation for our result might be related to a “false” and unrealistic expectation patients may have regarding their physical functioning as a whole before the operation. Specifically, they might mistakenly think that all aspects of their lives, including their sexual functioning, should and will improve once the surgery is completed.

On the other hand, in one study, Lukkarinen and Lukarinnen, in an eight-year follow-up of sexual functioning of CABG and PTCA patients, reported an improvement in men’s sexual satisfaction. As such, these contradictory reports might imply that sexual functioning in patients with CAD operations might be a “time-related” phenomenon which can vary with the passage of time. Specifically, it could be that improvement in sexual functioning requires long periods of time, and since in our study this function was measured two months after the surgery, enough time was not given for its improvement, therefore different outcome was observed. This finding can be clinically important in that sexual counselors and health psychologists can inform their patients of this fact in order to prevent the development of any false beliefs or expectations which can potentially cause them distress during the recuperation period following the surgery. As such, longitudinal studies are needed to explore this possibility.

In terms of the status of psychological factors in CABG and PTCA, the fact that depression, anxiety and stress decreased following successful operation is somewhat surprising given that a large body of evidence indicate an increase in psychological status of patients (Herbegue, Lahidheb, Labbene, & Haouala, 2014; Saur, et al., 2001; Doering, Chen, McGuire, Boda, & Irwin, 2014; Gaw-Ens, 1994). Nevertheless, our findings could imply that pre-operation emotional distress might simply be due to a lack of knowledge of the surgery and perceiving them as being a life threatening event. This finding can have implications for health psychologists and mental health professionals in that educating patients, who are candidate for these surgeries, about
the nature of the procedure prior to the operation can have a significant impact on their health status before the surgery and reduce their discomfort to a large extent. As such, educational sessions regarding revascularization procedures must be provided in order to ensure patients of the safety and effectiveness of these operations. In fact, the more knowledgeable the patients are about CHD, the more the possibility of addressing psychological issues will be. Furthermore, given that depression is linked to poor medical compliance (an essential behavior for patients undergone cardiac procedures to conform to) and other risk factors for cardiac heart diseases, the present results are important findings which can not only increase the quality of life, but also may reduce the rate of mortality and morbidity following the intervention.

Compliance with Ethical Standards

Informed Consent

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. Informed consent was obtained from all individual participants included in the study.

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The Effect of Coping Therapy on Immunological Indicators in Patients with Coronary Heart Disease

Alireza Aghayousefi1*; Ahmad Alipour2; Nasim Sharif3

Abstract

Objective: The studies since the second half of the 20th century have revealed the effect of stress on the heart and vessels with mediating neurological indicators and techniques of dysfunctional coping techniques. They also have shown that stress management and the improvement of coping techniques improve the indicators. The present study examined the appraisal of the effect of coping-therapy on cortisol, Interleukin 6 (IL-6) and Interleukin 1β (IL-1β) in comparison with the control group. Method: The study was a quasi-experimental research with pre-test and post-test design conducted on 44 patients (randomly assigned into two experimental and control groups) suffering from coronary heart disease who were hospitalized in ShahidRajaei Heart Hospital in Tehran. The experimental group was treated with coping-therapy, and the immunological indicators of both groups were measured using ELISA at the beginning, the fourth, the eighth, (immediately after the end of treatment), the tenth, and the fourteenth weeks. The collected data were analyzed using repeated measures ANOVA by SPSS. The gender and education of the sample was controlled statistically. Results: The results revealed that coping-therapy could significantly decrease cortisol from 4.693 to 2.519, IL-6 from 8.315 to 4.226, IL-1β from 2.759 to 1.850 from the PreTest to the end of the fourteenth week (follow-up). Conclusion: Considering the cognitive limitations of the present study, one can conclude that coping-therapy may decrease the negative effects of stress on immunological indicators through improving dysfunctional techniques to effective ones, and in this way, reveal the positive effects on health.

Keywords: Coping-Therapy, Immunologic, Cortisol, Interleukin, Coronary Heart Disease

Introduction

Developing research in recent years reveal that stress and socio-mental tensions are the age and gender independent factors as well as other classic physical risk factors of heart diseases that increase the cardiovascular responses through psycho-neuro-physiological mechanisms and the activation of the neural system, specially the sympathetic section that results in or keeps on cardiovascular diseases (Atkinson RL, 2000; Schwartz AR, 2003). The data supporting this relationship has been developing since the second half of the 20th century (Brammer L.M., 1993; Glozier N, 2013; Rozanski A, 1999; Saner, 2005; Steptoe A, 2012). Some studies have also been conducted on the mechanisms of stress on the immunity system and have revealed that the function of the system might be affected by stress (Segerstrom, 2004). In fact, stress influences the

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cardiovascular system in two ways: increasing the secretion of catecholamine, and increasing the secretion of corticosteroids that in long term harms the heart and vessels (Brammer LM, 1993)

Studies show that cortisol, Interleukin 6 (IL-6), and Interleukin 1β (IL-1β) are among the most significant mediators of stress (Lakhan, 2006; Rozanski A, 1999) with their density after stress (H. M. Steptoe A, Chida Y, 2007; Yamakawa K, 2009). Rohleder et al. found that stress plays a significant role in increasing the density of interleukin1β plasma levels (Rohleder N, 2006). Brydon et al. have revealed the seminal role of cytokine interleukin1β in the emergence of cardiovascular diseases (Brydon L, 2005). Qureshi et al. have emphasized on the role of stress on serum levels of cortisol (Qureshi GM, 2009). Von Kanel et al. in a study on 21 subjects with the mean age of 46.7, revealed that cute stress could cause a significant increase in interleukin 6 plasma levels that might cause the worsening of heart Coronary Heart Disease (CHD) and finally arteriosclerosis (Von Känel, 2006).

The studies on the relationship between stress and coping therapy with cortisol, interleukin 6, and interleukin1β have indicated that dysfunctional coping with stress might increase the cortisol and interleukin1β plasma levels. However, effective coping might decrease the cortisol and interleukin1β plasma levels by decreasing stress (Bayer U, 2010; Damsa, 1988). Other studies have revealed that the patients suffering from coronary vessel disorders make more use of dysfunctional techniques of coping with stress in comparison with healthy persons (Chiou A, 1997; Sarafino, 2002). The application of effective and dysfunctional coping techniques might bring up different consequences in health (Sarafino, 2002).

Dimesdale in a research on cognitive stress and its effect on cardiovascular diseases found that learning to control stress might decrease the risk of attacks and increase the function of ventricle muscles in coronary patients (Dimsdale, 2008). Linden, Melanie, and Leclerc in an analysis of 9856 heart patients came to the conclusion that psychotherapy can simultaneously decrease the death rate among the patients. They believe that psychological intervention is often a part of rehabilitation of heart patients (Linden, 2007). Using meta-analysis methodology, Shapiro in a study on explaining the correlation between the psychological reasons and the blockage of the coronary vessels, analyzed the results of 23 research done using random clinical trial. The results revealed the important role of stress in heart attacks. Also, the results from the comparison of 2024 heart patient group with the control group confirmed that psychological interventions and training to control stress significantly resulted in decrease of emotional disturbances, systolic hypertension, cardiac arrhythmia, and decrease of blood cholesterol in comparison with the patients who had not received such interventions. Patients under two years follow-up revealed that the rate of death among the persons who had not received psychological services had increased significantly (Shapiro, 2011). Aghayousefi et al. in a study examined the effect of coping-therapy on the hopelessness of infertile women. Their results revealed that coping-therapy decreased hopelessness, negative attitude toward the future, pessimism, lack of planning for the future, and failure expectancy in infertile women, but the results showed no significant effect on instability in thinking (Aghayousefi, A; Zare, H; Choobsaz, F & Motiei, G., 2011). In addition, Aghayousefi and Zare in a study on 100 female patients suffering from cardiovascular disorders, aged 35-55, examined the effect of coping-therapy on stress reduction of women suffering from cardiovascular disorders. The results indicated that the total scores of stress and stress originated in conflict and inner-family problems in the experimental group had decreased significantly. Their results showed that coping-therapy might, in long term, decrease the amount of stress in worsening these disorders in women suffering from coronary diseases (Aghayousefi, A; Zare H, 2009).
**Objective of the Study**

Considering the effect of stress and dysfunctional coping on the immunity system and its effect on health and specially the cardiovascular system, the purpose of the present study is to examine the effect of a psychological technique founded on improving the dysfunctional coping methods on the decrease of the cortisol and interleukin1β plasma levels.

**Method**

**Participants**

The population of the study consisted of Coronary Heart Disease (CHD) patients hospitalized in ShahidRajaei Heart Hospital in Tehran. Forty four volunteer CHD patients in the women internal ward, men internal ward, and private wards, whose coronary artery blockage (at least 90 percent in one main artery) was confirmed by angiography, were selected for the study. There were equal men and women in the sample. They divided in two equal groups with equal male and female patients. The age of sample was 45 and above. The requirement for the patients to participate in the study was their content and having no critical disease but CHD. The public and private wards of the hospital paved the way for participants from different socio-economic status to take part in the study. Information such as the disease period, hospitalization period, the degree of the blockage of their arteries, and other information were extracted from their medicine profile. The sample size was selected based on previous studies (Brenner K, 2011; Rohleder N, 2006; Roy, 2004; Steptoe A, &Chida Y, 2007).

**Ethical issues**

To observe the ethical issues, patients’ content, observation of their rights and freedom in the research, protecting against risks and dangers, confidentiality by the researchers, proper use of data, making patients aware of all tests conducted on them considering the dignity of patients, and the legal and ethical issues were considered in a written content letter. In addition, the researchers answered all questions by the patients and explained them that they might randomly be assigned into one of the experimental or control groups. After the end of the study, the intervention of experimental group was done for the volunteers in the control group. Furthermore, the performer of the intervention had passed the training sessions for coping-therapy and was qualified for the task.

**Measures**

Human IL-1β and IL-6 kits (made in Austria by Bender Med System) and cortisol (made in Germany by IBL manufacturing co.) with ELISA measuring technique that was used in other research (Bayer U, 2010) were applied in the present study. The method of measuring IL-1β and IL-6 were the use of Sandwich ELISA and the use of micro plates covered with monoclonal antibody against IL-1β and IL-6. To measure IL-1β, For example, first, 50 µL of the serum of each patient was added to each Cap with 50 ml sample diluents. Then from the standard, we made serial dilutions and added them to the related Caps. 50ml of monoclonal anti IL-1β that was conjugated with biotin was added to all Caps. After 2 hours incubation in the room temperature and on the rotator and 3 times washing, 100 ml streptavidin-HRP was added to all Caps. After 1 hour incubation in the room temperature and 4 times washing, 100 ml of the TMB substrate solution was poured into the Caps. After 10 minutes reaction with the solution, the stopping ceased and the content of plates were read by ELISA reader in 450nm wave length. After drawing the normal curve, the density of IL-1β per pg/ml was calculated based on the curve. In this research, to increase the accuracy and to control the quality, each sample was repeated several times.

To measure the amount of blood serum cortisol using ELISA in each of the Caps, ELISA streptavidin was coated. To the Caps, first, the patient’s serum with the amount mentioned in the kit and then, monoclonal antibody against cortisol were added.
In the case of existence of cortisol in serum, the cortisol makes a mixture that its antigen bonds with conjugated antibody and enzyme from one hand, and the antibody marked with biotin on the other hand. This combination through the biotin connected to the antibody links with the streptavidin in the bottom of the Cap. In the next phase, after finishing the incubation time and 3 times washing, substrate was added to the Caps. The substrate contains 2 A substrate that were tetramethylbenzidine and B substrate that is hydrogen peroxide (H2O2) both of which were mixed equally prior to consumption. The substrate was influenced by enzyme during the incubation period and produced a color that was read in 450 nm wave length.

### Intervention methods

Coping-therapy technique is used as a method to modify effective coping skills. The technique has been founded by Aghayousefi (AghaYousefi, 2001) based on type and strength of stress and individual’s coping methods using Lazarus-Folkman’s (Lazarus, 1984) transactional stress theory. In this type of intervention, the therapy sessions can be individual or team-based. In the group sessions, the general principles of group therapy sessions should be observed. The time for individual sessions is 45 minutes in average, and for groups the time is 2-3 hours. These sessions are except interview and even pre- and post-test sessions (Aghayousefi, A; Zare H, 2009). In this study, the coping-therapy sessions were 8 individual sessions, one session per week, and each session 1 hour.

### Research design and data analysis

Since the major sample was selected non-randomly and the subcategories were selected randomly, the study was a quasi-experimental one with pre and post-tests with control group. The biomarkers of cortisol and interleukin1β were

<table>
<thead>
<tr>
<th>Session on intervention</th>
<th>Activity content</th>
<th>Homework</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Definition of stress, its effect on health, introducing strategies to cope with stress and proper situations to use them in stressful contexts, discussion</td>
<td>Taking notes of the most stressful events in the last week and the actions done to reduce stress</td>
</tr>
<tr>
<td>2</td>
<td>Stating the experienced stress in the last week and reactions to these stress issues, more adaptable and effective coping methods that might be more useful in stressful events in the week, appraisals and practice to use more effective methods and writing down for next session</td>
<td>Using the practiced techniques in the session and rewriting of the stressful events in the week, appraisals and practice to use more effective coping methods and writing down for next session</td>
</tr>
<tr>
<td>3</td>
<td>Reporting the result of using new coping methods in appraisal of experienced stressful events during the week, the experiences emotions after the changes in behavior, more effective methods that might be used in the similar situations</td>
<td>Using the practiced methods in sessions and rewriting stressful events of the week, evaluating and practice for using effective coping methods and writing down for next session</td>
</tr>
<tr>
<td>4 to 8</td>
<td>Stating the stressful events of the last week, first and secondary appraisals, evaluating the degree of adaptability of new coping methods, emotions experienced, more effective coping methods that might have been used</td>
<td>Using the methods practiced in the session and rewriting of stressful events in the week, evaluating and practice to use effective methods and writing them down for next session</td>
</tr>
</tbody>
</table>
measured at the beginning, the fourth session of intervention, the eighth session, the post-test session (2 weeks after the eighth session), and the follow-up session (four weeks after the post-test) following 12 hours fasting period.

To test the research hypothesis, repeated measures ANOVA was run using SPSS 17.

**Results**

In the following section, the results of repeated measures ANOVA regarding the effect of coping-therapy on immunologic biomarkers are presented.

**Cortisol**

To test the effect of coping-therapy on the cortisol level of patients’ blood plasma in comparison with the control group, first the assumptions of repeated measures ANOVA were met and then the test was run. Table 2 displays the results.

The results in Table 2 reveal that the effect of time (from the pre-test to the follow-up sessions), which indicates the within group changes across time from the pre-test to follow-up session, is not significant (p=.900, F=.027). However, the interactive effect of group in time, which shows the effect of the type of interventions in changes in the means of both groups, is significant (p=.001, F= 26.310). Also, the interactive effect of gender in time and also the education in time that have been analyzed as covariate is not significant (p=.724, F=.163; p=.560, F=.399). Analyzing the means reveal that the amount of cortisol as an immunological marker in the experimental group in five phases (pre-test, after the fourth session of coping-therapy, after the eighth session, post-test, and the follow-up sessions) decreased, while in the control group, it increased.

**Interleukin 1β**

To test the effect of coping-therapy on the Interleukin 1β level of patients’ blood plasma in comparison with the control group, first the assumptions of repeated measures ANOVA were examined and then the test was run. Table 3 displays the results.

Results of repeated measures ANOVA (Table 3) reveals that the effect of time that states within group changes across time from the pre-test to the follow-up session is not significant (p=.786, F=.094); however, the interactive effect of group in time, indicating the effect of type of intervention in mean changes

| Table 2. Results of repeated measures ANOVA (cortisol immunological marker) |
|-----------------|-----------------|-----------------|-----------------|-----------------|
| Cortisol In Time (weeks) | Groups: Mean (SD) | Time effect | Time*group effect | Time*sex effect | Time*education effect |
|                  | Control | Coping-therapy | F(p value) | F(p value) | F(p value) | F(p value) |
| Pre-test         | 4.51 (1.55) | 4.69 (1.73) | 0.03 (0.90) | 26.31 (0.01) | 0.16 (0.72) | 0.40 (0.56) |
| 4th week of the start of treatment | 6 (2.49) | 3.6 (1.38) | | | | |
| 8th week (last session of treatment) | 6.93 (3.83) | 2.76 (1.41) | | | | |
| Post-test (10th week) | 7.12 (3.87) | 2.62 (1.47) | | | | |
| Follow up (14th week) | 7.18 (3.91) | 2.52 (1.45) | | | | |
of both group, is significant (p=.001, F=48.035). In addition, the interactive effects of gender in time and education in time that were considered as covariates in the analysis were not significant (p=.666, F=.221; p=.669, F=.217). Examining the means reveal that the amount of interleukin1β in the experimental group in five stages (pre-test, after week 4, after week 8, post-test, and follow-up session) has decreased, while in the control group, it increased.

Figure 2 displays the mean changes in interleukin1β in both groups in five stages.
Interleukin 6

To test the effect of coping-therapy on the Interleukin 6 level of patients’ blood plasma in comparison with the control group, first the assumptions of repeated measures ANOVA were met and then the test was run. Table 4 displays the results.

The results of repeated measures ANOVA (Table 4) reveals that the effect of time indicating within groups changes across time from the pre-test to follow-up sessions is not significant (p=.648, F=.243); however, the interactive effect of group in time indicating the effect of type of intervention in both groups’ mean changes is significant (p=.001, F=33.245). Also, the interactive effect of gender in time and education in time which were considered as covariates is not significant (p=.202, F= 1.686;

Graph2. Effects of Coping-Therapy on IL-1β from PreTest to Follow Up in comparison with control

![Graph2](Image)

Table 4. Results of repeated measures ANOVA (interleukin 6)

<table>
<thead>
<tr>
<th>Interleukin 6 In Time (weeks)</th>
<th>Groups: Mean (SD)</th>
<th>Time effect</th>
<th>Time*group effect</th>
<th>Time*sex effect</th>
<th>Time*education effect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control</td>
<td>Coping-therapy</td>
<td>F(p value)</td>
<td>F(p value)</td>
<td>F(p value)</td>
</tr>
<tr>
<td>Pre-test</td>
<td>7.63 (5.57)</td>
<td>8.32 (5.76)</td>
<td>.24 (.65)</td>
<td>33.25 (.01)</td>
<td>1.69 (0.20)</td>
</tr>
<tr>
<td>4th week of the start of treatment</td>
<td>8.45 (5.67)</td>
<td>6.81 (5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8th week (last session of treatment)</td>
<td>9.27 (6.07)</td>
<td>4.60 (3.66)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-test (10th week)</td>
<td>9.37 (6.10)</td>
<td>4.23 (3.45)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Follow up (14th week)</td>
<td>9.42 (6.05)</td>
<td>4.23 (3.45)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Analyzing the means revealed that the amount of interleukin 6 in experimental group in five stages (pre-test, after week 4 intervention, week 8, post-test, and follow-up session) decreased, and in the control group, it increased.

**Discussion**

The results of the present study revealed that the coping-therapy in treatment group compared to control group might decrease the immunologic indicators of cardiovascular patients including cortisol, interleukin 6, and interleukin 1β, and at least, up to six weeks after the last session of therapy, keeps it low. The findings of the study are in agreement with the results obtained by Dimsdale (2008), Linden, Melanie, and Leclerc (Linden, 2007), Shapiro (Shapiro, 2011), Aghayousefi et al. (Aghayousefi, A; Zare, H; Choobsaz, F & Motiei, G, , 2011), and Aghayousefi and Zare (Aghayousefi, H, 2009).

As observed, the coping-therapy within 8 treatment sessions revealed considerable changes in the amount of immunological biomarkers in CHD patients. It might be stated that although some studies revealed the effect of stress on health through biomarkers including cortisol, interleukin 6, and also interleukin 1β (Atkinson RL, 2000; Brammer LM, 1993; Glozier N, 2013; Lakhan, 2006; Qureshi GM, 2009; Rohleder N, 2006; Rozanski A, 1999; Saner, 2005; Schwartz AR, 2003; Segerstrom SC, 2004; H. M. Steptoe A, Chida Y, 2007; K. M. Steptoe A, 2012; Von Känel, 2006; Yamakawa K, 2009) that results in CHD (Brammer LM, 1993; Brydon L, 2005), other studies revealed the effect of using effective stress coping techniques in the decrease of these immunologic indicators (Bayer U, 2010; Chiou A, 1997; Damsa, 1988; Roy, 2004; Sarafino, 2002). Coping-therapy through directing the person to concentrate on initial and secondary appraisals of stressful events and efficiency of coping methods, and also avoiding one specific coping technique in life and using different techniques based on each stressful context, reduce the effect of stressful situations and consequently shows its useful effects.

**Graph 3. Effects of Coping-Therapy on IL-6 from PreTest to Follow Up in comparison with control**

![Graph 3](image-url)
on immunologic indicators. The patient in therapy sessions learns, when facing a stressful event, to do, first an initial appraisal and if threatening, considering the context and possibilities, takes advantage of the most appropriate coping technique and follows the secondary appraisals accordingly.

Despite merits of the present study, like any other studies in the literature, the limitations of the study should also be taken into account and avoid overgeneralization of the research findings. Although the previous studies revealed the positive effect of modifying dysfunctional coping techniques in improving the biomarkers of cardiovascular patients, it must be considered that the present study was done using coping-therapy technique with few clinical trials and needs replications. The sample size was not sufficientenough to be generalized; in addition, the study was conducted on a country with its specific cultural context.

Implication for health policy/practice/research/medical education

In order to reduce undesirable consequences and increase desirable medical outcomes in patients’ CHD, coping-therapy is highly recommended.

Acknowledgment

We are deeply grateful to the authorities and staffs atShahidRajaei Heart Hospital in Terhran who helped us conduct the research project.

Footnotes

Author Contributions
AlirezaAghayousefi: original idea, study design, manuscript preparation and supervisionof the study,
Ahmad Alipour: advisor of the study,and
Nasim Sharif: execution of experiment, collection of data and statistical analysis.

Funding Support

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Abbreviation

Micro Liter (ml)
Nano gram (ng)
Mili Liter (ml)
Pico gram (pg)
Nano meter (nm)
The Enzyme-linked immunosorbentassey (ELISA)
Horseradish Peroxidase (HRP)
Analysis of Variance (ANOVA)

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Effectiveness of Cognitive Therapy on Emotional Distress and Stress Coping Strategies in Patients with Multiple Sclerosis

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Abstract

The present study was conducted to evaluate the effectiveness of cognitive therapy on emotional distress and stress coping strategies in patients with Multiple Sclerosis. The design of study was semi-experimental with pre and post-test, with a control group. The participants were 30 patients with Multiple Sclerosis living in Tehran who were randomly assigned in the experimental and control groups. The data was gathered by Stress Coping Strategies Questionnaire, and Depression, Anxiety, and Stress Scale. The experimental group participated in 12 sessions of cognitive therapy, while the control group received no help. Results of Multivariate Covariance Analysis confirmed the effectiveness of cognitive therapy on improvement of anxiety, depression, and stress coping strategies in patients suffering Multiple Sclerosis (P<0.05). However, the groups were indifferent in terms of stress and emotion-focused cognitive strategies. Totally, the findings confirmed the importance of considering the effectiveness of cognitive therapy on improvement of emotional distress variables and stress coping strategies in Multiple Sclerosis patients.

Keywords: therapy, emotional distress, coping, multiple sclerosis

Introduction

Multiple Sclerosis (MS) is an inflammatory myelin-destructive disorder that involves brain hemispheres, optic nerves, cerebellar, and spinal cord. MS is accompanied by several clinical signs including weakness, vision disorders, and cerebellar signs (Caceres, Vanotti & Benedict, 2014). Usually, the age of developing MS and causing various inabilities is 20 to 40 in United States, almost 400,000 people suffer from MS and approximately 200 new patients are diagnosed weekly. There are nearly 2.5 million MS patients around the world (Asche, Singer, Jhaveri, Chung & Miller, 2010). Based on previous studies, the prevalence rate of MS in Iran is between 5.3 and 74.28 per 100,000 people (Etemadifar et al., 2013).

It is shown that patients with MS experience higher rates of emotional distress compared to the healthy people (Smith & Young, 2000; Beiske et al., 2008; Byatt, Rothschild, Riskind, Ionete & Hunt, 2011; Feinstein, 2011; Moore et al., 2012; Ostacoli et al., 2013; Theaudin, Romero & Feinstein, 2015) and those with similar inabilities (Schiaffino, Shawrny & Blum, 1998; Wallin, Wilken, Turner,
Williams & Kane, 2006). Dehqani, Mohammad khan Kermanshahi and Memariyan (2013) also concluded that among MS patients, 46.4% suffer from severe stress, 19.2% from severe anxiety, and 29.9% from severe depression. They also found a significant relationship between stress, anxiety, and depression with MS development, duration, and number of hospitalization.

Patients suffering Multiple Sclerosis experience more stressful situations due to chronicity disorder, and hence, mental pressure is higher among them compared to healthy ones (Poser, 2000). Studies display that stress coping strategies are deficient in these patients (Haqjou Sarvestani, 2010; Abedini, Montazeri & Khellatbari, 2012; Ahadi, Delavar & Rostami, 2014). Samadian (2012) concluded that MS patients use emotion-focused coping strategy, while healthy ones use problem-focused coping strategies more. Similarly, Goretti et al. (2010) reported that MS patients use problem-focused coping strategies less. In fact, these patients prefer to apply emotion-focused and avoidance coping strategies. Furthermore, since they flee from confronting mental pressure, which sometimes is the source of their problems, they do not aim to solve their problems. On the other hand, these coping strategies reduce their adjustments and cause various mental difficulties, including anxiety and depression.

Considering the special nature of Multiple Sclerosis, its undesirable and unpredictable signs, as well as its medical side and its effects on and prevalence among young people (Matti, Keane, McCarel, Klaer & Chen, 2010), applying psychological interventions along with medical therapies may help these patients greatly.

Cognitive therapy is a therapeutic process that helps patients to recognize their automatic thoughts and the relationship between these thoughts and their moods, and also to modify their thought carefully. The principle of this therapy is that thinking precedes moods and both depend on the individual’s physical reaction and his/her next behavior (Strunk, Hollars, Adler, Goldstein & Braun, 2014). In addition, learning to properly re-evaluate automatic thoughts is the most important skill that cognitive therapy tries to teach patients (Hundt, Mignogna, Underhill & Cully, 2013). Due to strong effects on automatic thoughts, and hence on moods, cognitive interventions have received special attention (Jarrett, Vittengl, Doyle & Clark, 2007). Studies on the effectiveness of cognitive therapy confirms its significant effect on emotional distress including depression (Jarrett, Vittengl, Clark & Thase, 2011; Lemmens et al., 2015; Narimani & Seyed Mousavi, 2015; Eisendrath et al., 2016), reduction of depression recurrence (Williams et al., 2014), anxiety (Van Son et al., 2014; Narimani & Seyed Mousavi, 2015), and stress (Van Son et al., 2014; Gu, Strauss, Bond & Cavanagh, 2015; Narimani & Seyed Mousavi, 2015). Rogers, Khoo, Mac Eachen, Oven, and Beatty (1996) reported a significant improvement in depression and touch sensitivity in MS patients. Hamdan-Mansour, Puskar and Bandak (2009) stated that after applying cognitive therapy, avoidance coping strategies as well as stress and depression signs are reduced. Also, Adler, Strunk and Fazio (2015) uphold that cognitive therapy significantly improved coping strategies and reduced depression signs.

Reviewing the research background manifests the importance of using cognitive therapy in MS patients. Studies on effectiveness of cognitive therapy have mainly investigated symptoms of psychological disorders. Since fewer studies have been performed on effects of cognitive therapy on emotional distress variables and stress coping strategies in MS patients, this research aims to evaluate effectiveness of this therapy on mentioned variables in patients with MS.

Method
Participants
The sample of this study consisted of 30 patients with Multiple Sclerosis who were member of Iran MS Association living in Tehran. They were selected voluntarily among other MS patients of this
association and put randomly into the experimental (N=15) and control (n=15) groups. Inclusion criteria were rejection of other disorders similar to MS, not having history of referring to psychologists or psychiatrist, absence of psychological and sever disorders (lack of hospitalization need), having at least diploma degree with the age between 20-40. After forming the groups, some participants refused to continue cooperation and therefore, the numbers in both groups were reduced (experimental=10, control=12). The experimental group received twelve 90-minute sessions cognitive therapy, while the control group received no intervention. Additionally, both groups filled the pre-test and post-test. Participants provided written informed consent for their participation in the study which contains of Lack of risk, the right to choose to participate in research and participants regard privacy.

**Instruments**

a) Stress Coping Strategies Questionnaire (SCSQ): Billings and Moos designed this questionnaire in 1981 to evaluate stress coping strategies. SCSQ has 19 items and measures emotional-focused and problem-focused coping strategies. Each item is based on a 4-rate degree (0=Never, 1=Sometimes, 2=Most of the time, 3=Always). Internal coefficient consistency for SCSQ via Cronbach’s alpha was reported 0.91.

b) Depression, Anxiety, and Stress Scale (DASS): this 21-Item scale was designed by Lovibond and Lovibond in 1995. Examinees answer each item on a 4-rate Likert scale (0=Never, 1=little, 2=Mostly, 4=Very). DASS has a high correlation with Beck’s

<table>
<thead>
<tr>
<th>Table 1. Contents of the cognitive therapy sessions</th>
</tr>
</thead>
<tbody>
<tr>
<td>First session</td>
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<tr>
<td>Second session</td>
</tr>
<tr>
<td>Third session</td>
</tr>
<tr>
<td>Fourth session</td>
</tr>
<tr>
<td>Fifth session</td>
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<tr>
<td>Sixth session</td>
</tr>
<tr>
<td>Seventh session</td>
</tr>
<tr>
<td>Eighth session</td>
</tr>
<tr>
<td>Ninth session</td>
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<tr>
<td>Tenth session</td>
</tr>
<tr>
<td>Eleventh session</td>
</tr>
<tr>
<td>Twelfth session</td>
</tr>
</tbody>
</table>
Depression Questionnaire. In a sample consisted of 717 normal individuals, Cronbach’s alpha of DASS for depression, anxiety, and stress were reported 0.81, 0.73, and 0.81 respectively.

Procedure
After forming the groups meeting inclusion criteria and explaining the study aim by the researchers, the participants signed a written testimony. Then, both groups filled SCSQ and DASS for the pre-test. Then, 12 sessions of 90-minute cognitive therapy (Beck, 1999) were hold for the experimental group. The collected data was analyzed via SPSS.

Results

The mean and standard deviation of the variables in the pre and post tests have been shown in Table 2. The results of multivariate covariance analysis showed that linear combination of the dependent variables were significant (Wilks Lambda=0.25; F=46.42; p<0.001) and hence, the experimental and control groups were significantly different in terms of these variables. Eta square manifests that the difference between these groups in the variables is totally significant (0.742); in other words, 74.2% of the difference between the two groups is due to the dependent variables (p<0.01).

The outcome of multivariate analysis showed that, regarding the calculated F coefficient, the difference between two groups in anxiety, stress, and problem-focused coping strategies were significant (P<0.05),

Table 2. Mean and standard deviation of the pre-test and post-test on stress coping strategies and emotional distress in the experimental and control groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>Pre-test</th>
<th></th>
<th>Post-test</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Problem-focused</td>
<td>Experimental</td>
<td>32.50</td>
<td>4.17</td>
<td>38.60</td>
<td>4.69</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>32.50</td>
<td>6.30</td>
<td>32.58</td>
<td>6.24</td>
</tr>
<tr>
<td>Emotion-focused</td>
<td>Experimental</td>
<td>15.40</td>
<td>2.79</td>
<td>15.60</td>
<td>3.06</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>14.50</td>
<td>1.93</td>
<td>14.75</td>
<td>2.54</td>
</tr>
<tr>
<td>Stress</td>
<td>Experimental</td>
<td>12.00</td>
<td>2.58</td>
<td>13.00</td>
<td>2.53</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>14.91</td>
<td>4.25</td>
<td>15.00</td>
<td>4.32</td>
</tr>
<tr>
<td>Anxiety</td>
<td>Experimental</td>
<td>15.30</td>
<td>3.56</td>
<td>7.00</td>
<td>1.49</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>14.91</td>
<td>4.25</td>
<td>15.00</td>
<td>4.32</td>
</tr>
<tr>
<td>Depression</td>
<td>Experimental</td>
<td>15.20</td>
<td>3.42</td>
<td>7.30</td>
<td>2.11</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>14.58</td>
<td>4.27</td>
<td>14.83</td>
<td>4.01</td>
</tr>
</tbody>
</table>

Table 3. Results of multivariate covariance analysis on stress coping strategies and emotional distress in MS patients

<table>
<thead>
<tr>
<th>Variable</th>
<th>Ss</th>
<th>df</th>
<th>F</th>
<th>P</th>
<th>Effect size</th>
<th>Statistical power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem-focused</td>
<td>148.50</td>
<td>1</td>
<td>8.51</td>
<td>0.001</td>
<td>0.506</td>
<td>0.98</td>
</tr>
<tr>
<td>Emotion-focused</td>
<td>3.42</td>
<td>1</td>
<td>0.80</td>
<td>0.38</td>
<td>0.045</td>
<td>0.14</td>
</tr>
<tr>
<td>Stress</td>
<td>6.79</td>
<td>1</td>
<td>0.82</td>
<td>0.38</td>
<td>0.046</td>
<td>0.14</td>
</tr>
<tr>
<td>Anxiety</td>
<td>19.62</td>
<td>1</td>
<td>3.78</td>
<td>0.05</td>
<td>0.182</td>
<td>0.45</td>
</tr>
<tr>
<td>Depression</td>
<td>76.78</td>
<td>1</td>
<td>14.40</td>
<td>0.001</td>
<td>0.459</td>
<td>0.95</td>
</tr>
</tbody>
</table>
i.e. cognitive therapy could improve problem-focused coping strategies and lessen anxiety and depression in the experimental group compared to the pre-test.

Another finding was that the mean of differences between the two groups, in terms of stress and emotion-focused coping strategies, were not significantly meaningful. In other words, cognitive therapy did not affect MS patients’ stress and frequency of using emotion-focused coping strategies.

**Discussion**

The present study was conducted to investigate the effectiveness of cognitive therapy on emotional distress and stress coping strategies in patients with Multiple Sclerosis. The results confirmed the significant impact of cognitive therapy on problem-focused coping strategies in MS patients. This finding is in line with Adler et al.’s (2015). In fact, cognitive therapy generally teaches patients cognitive strategies and improves their abilities in confronting problems. This therapy helps MS patients have a more logical attitude toward MS and do not use avoidance strategies (Madani, Navi pour & Ruzbiyani, 2007). However, this study found that MS patients still use emotion-focused strategy even after receiving cognitive therapy. This was inconsistency with the findings of Adler et al.’s (2015) and Hamdam-Mansour et al.’s (2009). To explain this finding, we can say that developing any disorder, such as Multiple Sclerosis, may cause patients high levels of psychological pressure and with its development, it hardens their lives more. On one hand, these patients may experience high levels of stress in order to organize their internal and external willing. While, on the other hand, since emotion-focused coping strategy is a strategy to confront difficulties, they may use it in spite of its low compatibility due to their situation and side effects of disorder.

This paper approved the effect of cognitive therapy on declining stress and depression in patients with Multiple Sclerosis, which was previously confirmed by Eisendrath et al. (2016), Lemmens et al. (2015), Narimani & Seyed Mousavi (2015), Williams et al. (2014), Van Son et al. (2014), and Jarret et al. (2011).

This finding can be justified by the fact that substructure of cognitive therapy is that patients’ situations will be improved by making a distance between themselves and their negative beliefs, and participating in various activities that gives them a sense of control. In other words, cognitive therapy helps individuals become aware of their automatic thoughts, illogical beliefs and expectations, and misunderstandings. So, change in deficient thought patterns and inefficient attitudes result in fading out negative automatic thoughts and finally, relieving their anxiety and depression.

Cognitive therapy was not effective in reducing stress of MS patients in this study, which was against the results of Gu et al. (2015), Narimani & Seyed Mousavi (2015) and Van Son et al.’s studies (2014). Multiple Sclerosis as a progressive and chronic disorder may cause various threatening stressful events in patients’ personal lives, including divorce, losing their jobs, or family contacts (Mohr & Pelletier, 2006). Worrying about providing therapeutic costs, inability for self-care, lack of welfare facilities, and change in family pattern may increase their stress (Judicious & McCabe, 2007). As the previous studies show, probability of suffering from stress is very high in these patients since they have accustomed to stressing thought and are always worried about their disorder progress in future. Since increase of MS duration may enhance patients’ stress, continuous teaching of proper ways of coping with stress can improve patients’ compatibility and may also boost their self-confidences.

**Conclusion**

In fact, it seems the Cognitive therapy affects MS patients’ problem-focused coping strategies, anxiety and depression through enhancing therapeutic alliance and resolving interactional conflicts. Therefore, given the effectiveness of this type of therapy and its benefits for these patients’
psychological health.

Among limitations of the current study, we can refer to the problems related to MS patients’ fatigue which made it difficult for them to keep participation. The other limitation was the absence of follow-up due to time shortage. It suggested that all MS centers of Iran include cognitive therapy in programs of teaching classes for these patients. Additionally, it is suggested that scholars perform the same cognitive therapy design on various groups of patients in terms of development time and experiencing Multiple Sclerosis for a long time. Attending gender differences is also recommended.

Acknowledgments

The authors thank Iran MS Association who sincerely helped them to perform this study.

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Questions of Self-regulation and Affect: Affectivity, Locomotion, Assessment, and Psychological Well-Being

Danilo Garcia1-5*, Ali Al Nima1,3, Erik Lindskär1,3, Alexander Jimmefors2,3, Trevor Archer2,3, Shane MacDonald3

Abstract

Background: The affectivity system is a complex dynamic system, thus, it needs to be seen as a whole-system unit that is best studied by analyzing four profiles: self-destructive (low positive affect, high negative affect), low affective (low positive affect, low negative affect), high affective (high positive affect, high negative affect), and self-fulfilling (high positive affect, low negative affect). Our purpose was to examine individual differences in psychological well-being and self-regulatory strategies (assessment/locomotion). Additionally, we investigated if the effect of psychological well-being on self-regulatory strategies was moderated by the individual’s type of profile. Method: Participants (N = 567) answered the Positive Affect Negative Affect Schedule, Ryff’s Scales of Psychological Well-being, and the Regulatory Mode Questionnaire. We conducted a Multivariate Analysis of Variance using age as covariate and Structural Equation Modeling in a multi-group for moderation analysis.

Result: Individuals with a self-fulfilling profile scored highest in all psychological well-being constructs and locomotion and lowest in assessment. Nevertheless, matched comparisons showed that increases in certain psychological resources might lead to profile changes. Moreover, while some psychological well-being constructs (e.g., self-acceptance) had an effect of self-regulatory mode independently of the individual’s profile, other constructs’ (e.g., personal growth) effect on self-regulation was moderated by the person’s unique type of profile.

Conclusions: Although only theoretical, these results give an idea of how leaps/changes might be extreme (i.e., from one profile at the extreme of the model to the other extreme), while other might be serial (i.e., from one profile to another depending on matching affective dimensions).

Key words: Affective Profiles Model, Assessment, Cluster Analyses, Locomotion, Person-Centered Methods, Psychological Well-Being, Self-regulatory Mode.

Introduction

Positive affect and negative affect are indicators of well-being (Diener, 1984) and are not only related to different behavior (see Lyubomirsky, King & Diener, 2005; Watson, Clark & Tellegen, 1988), but are also influenced by genes and the environment to different extent (see Cloninger & Garcia, 2015). This independent inter-relationship between the two affectivity dimensions implies that individuals do not only differ in affectivity between each other but also within themselves, that is, the affectivity system is a complex dynamic adaptive system1 (Garcia, Adrianson, Archer & Rosenberg, 2015). Indeed, human personality is a non-linear dynamic system (Cloninger, 2004) that responds to the laws of attractor

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1- See also Bergman & Wångby, 2014; Bergman & Magnusson, 1997, who suggest that complex dynamic systems should be seen as a whole-system unit that is best studied by analyzing patterns of information or profiles; and Cloninger, Svrakie & Svrakie, 1997, who explain nonlinear dynamics in complex adaptive systems.
states\(^1\), which are essential for the understanding of most physical and human phenomena, affectivity included (Hiver, 2014). In this line of thinking, Archer and Garcia have repeatedly used the following four combinations or profiles of individuals’ experience of positive and negative affect: self-fulfilling (i.e., high positive affect, low negative affect), high affective (high positive affect, high negative affect), low affective (low positive affect, low negative affect), and self-destructive (low positive affect, high negative affect). Individuals with different affective profiles (i.e., different of high/low positive/negative affect), for example, report different levels of psychological well-being—a multidimensional construct consisting of six different constructs or psychological resources: positive relations with others, environmental mastery, self-acceptance, autonomy, purpose in life, and personal growth (Ryff, 1989). In this context, a person’s strategy to approach success and/or avoid failure when assessing and acting upon goals (i.e., an individual’s regulatory mode; Kruglanski, Thompson, Higgins, Atash, Pierro, Shah & Spiegel, 2000) should also be associated to the affectivity system (i.e., positive affect and negative affect). Moreover, individuals might not only differ in the way they regulate their behavior depending on their affective profile, the effect of a person’s psychological well-being (i.e., psychological resources) on her/his regulatory mode might also be moderated by her/his own affective profile.

With regard to psychological well-being, individuals with a high positive affect profile, particularly those with a self-fulfilling profile, report higher levels of self-acceptance and environmental mastery compared to individuals with a self-destructive profile (Garcia, 2012, Garcia & Archer, 2012 Garcia & Siddiqui, 2009). At a first view, it is easy to assume that positive affect creates psychological benefits, or resources, which help the individual finding meaning in her/his life and to regulate behavior towards important goals (cf. Fredrikson, 2006; Garcia & Archer, 2012). Nevertheless, this does not explain why individuals with a low-affective profile experience higher life satisfaction and psychological well-being than self-destructive individuals, but not lesser than individuals with a high affective profile (Garcia & Siddiqui, 2009ab). After all, the low affective profile is characterized by low affectivity per se. One of the main explanations to this observation is that individuals with different profiles might achieve well-being through the use of different self-regulatory strategies. In other words, individuals are able to regulate their well-being, probably by specific strategies that fit their affective profile to maintain homeostasis in their affective system (cf. Garcia, Rosenberg, Erlandsson & Siddiqui, 2010; Garcia, Sailer, Nima & Archer, 2016).

In this context, two regulatory modes have been distinguished by earlier research: assessment and locomotion. Assessment is the comparison and judgment aspect of self-regulation in which the individual critically evaluates goals and/or means in relation to different alternatives (Kruglanski et al., 2000; see also Higgins, 2001, 2012). That is, high levels of assessment suggest that the person constantly evaluate themselves and other persons in relation to different outcomes and attainments. Their main focus lies in doing the right thing under the given circumstances (Kruglanski et al., 2000). Locomotion, on the other hand, is the operational drive and endurance to achieve a desired goal, that is, the capability of advancing step-by-step through each stage that leads to the desired goal. In other words, high levels of locomotion indicate that a person’s main interest lies in simply moving on and “just doing it” (Kruglanski et al., 2000; Pierro, Giacomanonio, Pica, Kruglanski & Higgins, 2013). Studies using the affective profiles models as the background for individual differences (e.g.,

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1- Fixed points, or steady states of a given dynamical system; these are values of the variable that don’t change over time. Some of these fixed points are attractive, meaning that if the system starts out in a nearby state, it converges towards the fixed point (https://en.wikipedia.org/wiki/Dynamical_systems_theory).
Jimmefors et al., 2014) suggest a clear association between assessment and high negative affect profiles (i.e., high affective and self-destructive), but also to those with low positive affect (i.e., low affective and self-destructive). Locomotion, on the other hand, is clearly associated to high positive affect profiles (i.e., self-fulfilling and high affective). These findings, together with others using the affective profile model, are in line with descriptions of high “assessors” as vigilant, careful, critical, and calculated (Pierro et al., 2006) and descriptions of “locomotors” as doers, go-getters, and people of action (Pierro et al., 2006; Amato, Pierro, Chirumbolo & Pica, 2014).

That being said, the usefulness of the affective profiles model is that it helps to understand the dynamics within the system as well (Garcia, MacDonald & Archer, 2015). For example, in which conditions do individuals who are similar in one affect dimension but that differ in the other affect dimension are distinct from each other in regulatory modes and psychological well-being? This is a question that cannot be discerned when we only compare individuals who are diametrically different (i.e., at the extremes of the model: self-destructive versus self-fulfilling and low affective versus high affective). It can be answered when we compare those who match in one affective dimension but that differ in the other (i.e., within differences): self-destructive versus high affective (matching: high-high negative affect, differing: low-high positive affect), self-destructive versus low affective (matching: low-low positive affect, differing: high-low negative affect), high affective versus self-fulfilling (matching: high-high positive affect, differing: high-low negative affect), and low affective versus self-fulfilling (matching: low-low negative affect, differing: low-high positive affect). For instance, in a recent study, Garcia and colleagues (Garcia, Sailer, Nima & Archer, 2016; see also De Caroli & Sagone, 2016; Di Fabio & Bucci, 2015) showed that individuals with a low affective profile achieve homeostasis through being fatalistic of their present, that is, seeing their life path as controlled by external forces, avoiding to worry about the future because they see it as uncontrollable, believing in luck or fate rather than hard work, and avoiding to set goals. This strategy does indeed help individuals with a low affective profile to prevent unhappiness (i.e., low levels of negative affect) and is certainly in line with how their affectivity system dynamically regulates itself, probably through high levels of assessment (cf. self-regulatory theory; Higgins, 2001). In other words, by being fatalistic about their present they prevent becoming disappointed and just the absence of that possible disappointment makes them feel satisfied with their life (Garcia, Rosenberg, Erlandsson & Siddiqui, 2010; see also Fredriksson, 2006; Garcia & Siddiqui, 2009a). Of course, at the same time the usage of this strategy limits their experience of positive emotions, which might explain why they are not as satisfied with life as individuals with a self-fulfilling profile.

In sum, individuals differ in psychological well-being and regulatory mode depending on their affective profile. These differences probably fit their profile to maintain homeostasis within their affective system (cf. Garcia, Rosenberg, Erlandsson & Siddiqui, 2010). If so, different psychological resources (i.e., psychological well-being constructs) might influence individuals’ regulatory mode depending on their affective profile. The present study is a replication, using a larger sample than those in earlier studies, of differences in psychological well-being and regulatory mode between individuals with distinct affective profiles. We expected individuals with a self-fulfilling profile to report higher levels of psychological well-being, lower levels of assessment, and higher levels of locomotion. By investigating differences between individuals that match in one affective dimension and differ in the other, we expand earlier findings. As another addition to the current literature, we also addressed the question whether or not the effect of psychological well-being dimensions on regulatory
mode was moderated by the individual’s type of profile.

Method

Ethical statement

After consulting with the Network for Empowerment and Well-Being’s Review Board we arrived at the conclusion that the design of the present study (e.g., all participants’ data were anonymous and will not be used for commercial or other non-scientific purposes) required only informed consent from the participants.

Participants

A total of 579 individuals were recruited from a University and two high schools in the west of Sweden (207 males, 367 females, and 5 who did not report their gender, mean age = 21.90 years SD = 6.42 years, with a range of 17 to 69 years). A total of 12 individuals did not report their age. Since we corrected for age, this left a final sample of 567 respondents.

Procedure

The university students were psychology undergraduates who were asked to fill out the survey after a lecture. The high school pupils were from a medium size technical high school with a “computer-profile” and from a high school located in a small city in the western side of Sweden. This is one of the biggest high schools in Sweden with a comprehensive catchment area that lead to a wide selection of psychosocial-economics backgrounds among the pupils. The pupils were selected by the criteria of being in their last year of high school (i.e., 18 years of age) in order to collect their final grades, a variable included in a longitudinal study. The principals and responsible teachers authorized the study and the data was collected by one of the authors of the study. The school counselor was informed of the study and received a copy of the survey in case of the survey raised any thoughts or questions among the students. Also, the e-mail addresses and names of those responsible for the study were given to all students so that they could contact them later on. The students participated through responding to an online version of the survey, uploaded onto the internal network of the schools, which each student had access to, therefore all respondents had to be students on the school and registered on the courses that took place in the last year. In case of any technical issues, all students where offered a paper version of the survey. All students were informed of the participation being voluntary and strictly confidential. Completing the survey required approximately 30 minutes and one of the authors was present during the whole time to answer any questions.

Measures

Affect. The Positive Affect and Negative Affect Schedule (Watson et al., 1988) assesses affect by requiring participants to indicate on 5-point Likert scale (1 = very slightly, 5 = extremely) to what extent they generally experienced 20 adjectives describing affect states (10 positive affect, such as, strong, proud; 10 negative affect, such as, afraid, nervous) within the last few weeks. The Swedish version has been used in previous studies (e.g., Garcia and Erlandsson, 2011) and demonstrated acceptable internal consistency in the present study: Cronbach’s alpha for positive affect was .85 and .85 for negative affect.

Regulatory mode. The two regulatory modes were measured by the Regulatory Mode Questionnaire (Kruglanski et al., 2000), which comprises 30-item (e.g., for “assessment”, ‘I often critique work done by myself or others’; for “locomotion”, ‘I am a “doer”’) with a 6-point Likert scale (1 = strongly disagree; 6 = strongly agree). The Swedish version has been used in previous studies (e.g., Jimmefors et al., 2014; Garcia et al., 2015). In the present study Cronbach’s alpha were .75 for assessment and .74 for locomotion.

Psychological Well-Being. Ryff’s Psychological Well-Being Scales short version (Clarke, Marshall,
Ryff and Wheaton, 2001) comprises 18 items with a 6-point Likert (1 = strongly disagree; 6 = strongly agree), 3 items for each of the 6 dimensions: self-acceptance (e.g., “I like most aspects of my personality”), personal growth (e.g., “For me, life has been a continuous process of learning, changing, and growth”), purpose in life (“Some people wander aimlessly through life, but I am not one of them”), environmental mastery (e.g., “I am quite good at managing the responsibilities of my daily life”), autonomy (e.g., “I have confidence in my own opinions, even if they are contrary to the general consensus”), and positive relations with others (e.g., “People would describe me as a giving person, willing to share my time with others”). The Swedish version has been used in previous studies (Jimmefors et al., 2014; Garcia and Siddiqui, 2009a; Garcia et al., 2015) and it has showed low to moderate reliability for most of the subscales. In the present study Cronbach’s alphas were .77 for self-acceptance, .56 for personal growth, .55 for purpose in life, .68 for environmental mastery, .55 for autonomy, and .57 for positive relations with others.

Statistical treatment

In previous research regarding the categorization of the affective profiles, the respondents have been sorted into one of the four groups by dividing scores into high and low affect in reference to the median (e.g., Norlandet et al., 2002). In this study, we used cluster analysis instead of the more traditional median splits. Other studies (e.g., Macdonald & Kormi-Nouri, 2013) demonstrated that k-means cluster discern four affective profiles, the combinations of high vs. low affectivity, as proposed by Archer and colleagues (see also Garcia, MacDonald & Archer, 2015). This resulted in the following distribution of participants in the four affective profiles: 77 in the self-destructive profile (low positive and high negative affect), 146 in the low affective profile (low positive and low negative affect), 129 in the high affective profile (high positive and high negative affect), and 215 in the self-fulfilling profile (high positive and low negative affect).

Results

Differences in psychological well-being and regulatory mode

One Multivariate Analysis of Variance (MANOVA) was performed using positive relations, environmental mastery, self-acceptance, autonomy, personal growth, purpose in life, locomotion, and assessment as the dependent variables. The participants’ type of affective profile (i.e., self-destructive, low affective, high affective, and self-fulfilling) was the independent variable, while age was used as the covariate.

The type of affective profiles had a significant effect on the psychological well-being and regulatory mode dimensions ($F(24, 1635) = 14.76, p < .001$, Pillai's Trace = .53). Compared to individuals with any of the other three profiles, Individuals with a self-fulfilling profile scored higher in positive relations ($F(3, 350) = 32.59, p < .001$), environmental mastery ($F(3, 350) = 118.25, p < .001$), self-acceptance ($F(3, 350) = 85.01, p < .001$), autonomy ($F(3, 350) = 16.79, p < .001$), and personal growth ($F(3, 350) = 22.89, p < .001$). Additionally, individuals with a self-fulfilling profile scored higher in purpose in life ($F(3, 350) = 9.84, p < .001$) and locomotion ($F(3, 350) = 36.20, p < .001$) compared to individuals with either a self-destructive or a low affective profile. Individuals with a self-destructive profile scored higher in assessment as compared to individuals with either a self-fulfilling or a low affective profile ($F(3, 350) = 18.55, p < .001$). See Table 1 for all the details when diametrically different profiles and within differences were investigated.

Multi-group moderation analysis

To investigate which of the psychological dimensions that were related to both assessment and locomotion, we performed a path analysis, using AMOS (version 21)—in order to estimate
interaction/moderation effects between affective profiles as the moderator, psychological well-being dimensions as independent variables, and assessment and locomotion as the outcome. The structural equation model of multi-group analysis resulted into a Chi-square = 11.03; DF = 4; p < .05. The path model yielded a good fit, as indicated by comparative fit index = .99; incremental fit index = .99, normed fit index = .99 and root mean square error of approximation = .06. In essence, the analyses showed that 18% to 31% of the variance of locomotion and 14% to 23% of the variance of assessment were explained by the 6 dimensions of psychological well-being via affective profiles (See Table 2 for the details).

Locomotion was significantly predicted by personal growth for individuals with any of the four affective profiles (see Tables 2 and Figure 1). In other words, its relation was not moderated by the individual’s type of profile. Locomotion was also significantly predicted by environmental mastery among individuals with either a high affective or a self-fulfilling profile (see Figure 1), thus, suggesting that this relationship is moderated by positive affect. A specific moderation effect was found among individuals with a low affective profile, among whom, autonomy significantly predicted locomotion (see Figure 1). This was not the case for individuals with any of the other profiles. For Assessment, personal growth was the most common predictor among individuals with either a self-destructive, or a low affective, or a self-fulfilling profile (see Figure 1). A unique moderation effect was found among individuals with a self-destructive profile, among whom positive relations predicted lower levels of assessment (see Figure 1). Environmental mastery predicted also lower levels of assessment among individuals with either a low affective or a high affective profile (see Figure 1). Purpose in life predicted assessment among individuals with either a high affective or a self-fulfilling profile (see Figure 1). Finally, a unique moderation effect was found among individuals with a self-fulfilling profile, among whom assessment was significantly predicted by self-acceptance (see Figure 1).

**Discussion**

The present study replicated, using a larger sample compared to previous studies, results with regard to differences in psychological well-being and regulatory mode between individuals with distinct affective profiles. At a general level, individuals with a self-fulfilling profile reported the best possible outlook when compared to individuals with a self-destructive profile: higher ability to be cooperative and to have warm relations with others.
Table 2. Structural coefficients for the structural equation model of multi-group moderation among individuals with a self-destructive (Panel A), low affective (Panel B), high affective (Panel C), and a self-fulfilling (Panel D) profile in which the psychological well-being dimensions are the predictors of locomotion and assessment.

<table>
<thead>
<tr>
<th>Predictors</th>
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<th>P</th>
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<td>.31</td>
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</table>

A. Self-destructive

B. Low Affective

C. High Affective

Questions of Self-regulation and Affect; Garcia, et al

(Continued)
important predictors of mental health per se (Cloninger, 2004, 2006, 2013) and seem here to be even more relevant than individuals with a low affective profile (see Figure 2, black arrows).

Using matched comparisons helped us to discerned that increases in psychological resources such as positive relations with others might lead to increases in positive affect even when negative affect is high (self-destructive vs. high affective) or low (low affective vs. self-fulfilling) and decreases in negative affect even when positive affect is low (self-destructive vs. low affective) or high (high affective vs. self-fulfilling). This same pattern was found for increases in environmental mastery and self-acceptance (see Figure 2, grey arrows).

Note: Significant regression weights are shown in bold type, ns is not significant.
Figure 1. Structural equation model of locomotion and assessment as the dependent variables predicted by psychological well-being dimensions via (A) the self-destructive profile ($n = 77$), (B) the low affective profile ($n = 146$), (C) the high affective profile ($n = 129$), and (D) the self-fulfilling profile ($n = 215$).

Note: $\text{Chi-square} = 11.03; DF = 4; p < .05; \text{comparative fit index} = .99; \text{incremental fit index} = .99$, normed fit index $= .99$ and root mean square error of approximation $= .06$. $e = \text{error}$. Standardized parameter estimates of regression weights in red are significant at the $p < .001$ level and those in blue are significant at the $p < .05$ level.
to push all individuals, independently of type of affective profile, to self-fulfilment (see Figure 2). Increases in personal growth, in contrast, do not lead to lower negative affect when positive affect is low (self-destructive vs. low affective). But do lead to high positive affect when negative affect is high (self-destructive vs. high affective) and low (low affective vs. self-fulfilling) and lead to low negative affect when positive affect is high (high affective vs. self-fulfilling). In other words, at least for an individual with a self-destructive profile, increases in the sense of life as a learning experience will not lead to low affectivity, it will rather lead to self-fulfilment or to high affectivity and then to self-fulfillment. Personal growth has indeed been described as not necessarily a pleasant and unemotional experience (Ryff, 1989); it rather is attuned to a life worth living (Cloninger, 2004). Increases in autonomy were associated to low negative affect when positive affect was low (self-destructive vs. low affective) or high (high affective vs. self-fulfilling) and to high positive affect when negative affect was low (low affective vs. self-fulfilling). In contrast, increases in autonomy were not linked to high positive affect when negative affect was high (self-destructive vs. high affective). In this regard, negative affect or/and amygdalae activity is linked to less brain activity in the prefrontal cortex, while the sense of free will is linked to high levels of positive affect and prefrontal cortex activity (Cloninger, 2004). It is probable that our findings suggest that high negative affect in conjunction with low levels of positive affect impair the positive effects of having a sense being free or autonomous. In this context, psychophysiological coherence, a state of calm alertness that occurs naturally with sustained positive emotions, might be helpful for individuals with a self-destructive affective profile, since this state increases efferent parasympathetic activity and it is associated to increases in frontal lobe activity, thus, allowing the expression of character and sense of free will (Zohar, Cloninger & McCraty, 2013)—psychophysiological coherence can be induced by slow, deep breathing, relaxing, and sleeping (Zohar et al., 2013). This is, for instance, in line with research showing that individuals with a self-destructive profile have sleeping problems and problems relaxing, which in turn might explain why increases in their level of autonomy are not associated with increases of positive affect.

As an addition to the current literature, we also addressed the question whether or not the effect of psychological well-being dimensions on regulatory mode was moderated by the individual’s type of profile. For individuals with a self-destructive profile: assessment was negatively predicted by positive relations and positively by personal growth; locomotion was positively predicted by personal growth. For individuals with a low affective profile: assessment was negatively predicted by environmental mastery and positively by personal growth; locomotion was positively predicted by autonomy and personal growth. For individuals with a high affective profile: assessment was negatively predicted by environmental mastery and positively by purpose in life; locomotion was positively predicted by environmental mastery and personal growth. For individuals with a self-fulfilling profile: assessment was negatively predicted by self-acceptance and positively by personal growth and purpose in life; locomotion was positively predicted by environmental mastery and personal growth. Personal growth was the main psychological resource to be directly linked to locomotion. That is, independently of the individual’s type of affective profile, seeing life as a learning field (i.e., personal growth) might always promote a ‘just do it’ mentality. This is also in line with the fact that personal growth is not solely linked to frequently experiencing positive emotions, but also experiencing negative emotions and all combinations in-between (Ryff, 1989). All these moderation effects illustrate the usefulness of person-oriented methods when studying complex non-linear adaptive systems; in this case the affective system. For example, autonomy or the sense of free
will seem to lead individuals with a low affective profile to approach goals in locomotion mode. For their diametrical opposites, individuals with a high affective profile, it was their sense of mastery with their environment what promoted a locomotion mode when approaching goals. This is in line with earlier research suggesting that individuals with a low affective profile are introverted and seek inner peace.
in order to keep homeostasis, while individuals with a high affective profile are extroverted and seek cues outside themselves to keep their affective balance (see also Garcia, Adrianson, Archer & Rosenberg, 2015).

One important limitation is the fact that the sample was constituted of students and pupils. Nevertheless, in comparison to earlier studies, the sample used here was relatively large and more diverse (see for example Jimmefors et al., 2014). In the present study we suggested that psychological resources, in the form of psychological well-being, were expected to predict the type of self-regulatory strategy individuals with different profiles would use when striving for goals in their lives. Regulatory mode manipulation has actually been reported to influence behavior (see any work by Higgins), hence, it is possible to expect the opposite: regulatory mode predicts which psychological resources the individual develops. As a matter of fact, persistence, a temperament dimension similar to the locomotion regulatory mode, acts as a link between a person’s temperamental disposition (i.e., temperament profile based on levels harm avoidance, novelty seeking, and reward dependence) and their character development (i.e., character profile based on levels of self-directedness, cooperativeness, and self-transcendence; Cloninger, 2004). In other words, it is possible that, for example, people might develop a sense of autonomy depending on their tendency to persevere and move step by step towards a goal. Without repeated measures or interventions studies, the question of causation remains uncertain.

Conclusions

Our study shows the value of using models that are person-centered when investigating differences between individuals’ health. We could observe a kind of “movement” associated to how different psychological resources and self-regulatory strategies might push an individual with one type of affective profile towards another profile. Although only theoretical, this gives an idea of how some leaps might be sudden as quantum leaps (i.e., from one profile at the extreme of the model to the other extreme: black arrows in Figure 2), while other might be serial (i.e., from one profile to another depending on matching affective dimensions: grey arrows in Figure 2). The results also suggest that what marks the direction of the theoretically possible “movement” is which affective dimension is that matches, together with which psychological resources and regulatory strategies that are active.

“That which is in locomotion must arrive at the half-way stage before it arrives at the goal.”

Aristotle

Competing Interests

Dr. Danilo Garcia is the Director of the Blekinge Centre of Competence, which is the Blekinge County Council’s research and development unit. The Centre works on innovations in public health and practice through interdisciplinary scientific research, person-centered methods, community projects, and the dissemination of knowledge in order to increase the quality of life of the habitants of the county of Blekinge, Sweden. He is also an Associate Professor at the University of Gothenburg and together with Professor Trevor Archer and Associate Professor Max Rapp Ricciardi, the leading researcher of the Network for Empowerment and Well-Being. Erik Lindskär is a research assistant and Ali Al Nima is a statistician at the Blekinge Centre of Competence and together with Dr. Shane MacDonald and Alexander Jimmefors members of the Network for Empowerment and Well-Being.

Data Availability

The raw data is available upon request to the Network for Empowerment and Well-Being, lead researcher Danilo Garcia: http://ltblekinge.se/Forskning-och-utveckling/Blekingekompetenscentrum/Summary-in-English/.
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different approaches to the affective profiles model: median splits (variable-oriented) and cluster analysis (person-oriented). *PeerJ*, 3:e1380. DOI: 10.7717/peerj.1380.


Post coronary heart diseases depression: role of illness perception and coping strategies

Nader Monirpour*

Abstract

Objective: Due to unpleasant consequences of depression in patients suffering from cardiac diseases, such as increase in mortality rate during the first year, especially after undergoing a surgery; this study addresses structural relationships between cognitive and behavioral variables including illness perception and coping strategies in predicting depression after undergoing Coronary Artery Bypass Grafting (CABG) and Percutaneous Coronary Intervention (PCI). Besides, one of the cognitive models for assessing psychological adaptation with chronic medical diseases was outlined for the first time. Method: The sample comprised 245 coronary patients confronted with the diagnosis for the first time, who had undergone PCI and CABG interventions. They were chosen and interviewed through convenience sampling following one month of initiating treatment process. For this purpose, Beck Depression Inventory for Primary Care (BDI-PC), Coping Inventory for Stressful Situations (CISS-21) and the short format of Disease Perception Questionnaire were administered. Data was analyzed using structural equations modeling (LISREL software). Results: findings indicated that applying emotion-focused coping strategies determined 40% of depression variance in these patients, whereas problem-focused strategies determined 4.5% of it and avoidant coping strategy didn’t have a significant role in depression. On the other hand, illness perception as a cognitive variable, could directly determine 26% of depression and 4.5% of it through emotion-focused strategies and 0.25% by means of problem-focused strategies. Also illness perception, could meaningfully determine 50% of emotion-focused coping variance, 7% of problem-focused variance and 8% of avoidance variance. Conclusion: Overall results of this study supported Leventhal’s theoretical model of self-regulation and verified the role of cognitive variables (illness perception) and behavioral ones (coping strategy) in emerging depression. Therefore it is recommended that much attention be drawn to the process of developing patient’s illness perception through personal or group trainings and if necessary, offering effective cognitive and behavioral treatments by practitioners.

Keywords: post coronary heart diseases depression, illness perception, coping strategies, CABG, PCI.

Introduction

Psychological symptoms and disorders, which are widespread among coronary heart patients, are amongst most considerable factors increasing mortality rate. One of the psychological issues causing patients to be vulnerable to cardiac diseases while simultaneously can be a consequence of suffering from heart disease, is depression (Surtees, Wainwright, Luben, Wareham, Bingham & Khaw, 2008; Mykletun, Bjerkeset, Dewey, Prince, Overland & Stewart, 2007). Depression is pervasive in patients suffering from CHD, particularly after undergoing myocardial infarction. Prevalence of depression in patients suffering from cardiac diseases is 3 to 4 times more than general public (Sheps & Rozanski, 2005). Over 25% of patients with cardiac diseases, suffer from sever and progressive major depression following a heart attack. Almost 17 to 27% of these
patients experience clinical symptoms of depression and more than 42% of them move towards major depression through the next year (Januzzi, Stern, Pasternak & De Sanctis, 2000; Perez, Nicolau, Romano & Laranjeira, 2005; Lane, Carroll, Ring, Beevers & Lip, 2002).

Depression has been recognized as a risk factor in emerging coronary heart disease since around 20 years ago and has been identified as a risk factor in causing mortality due to coronary heart diseases from almost 15 years ago (Carney & Freedland, 2007). Death rate during the first six months following a heart attack in patients suffering from coronary heart diseases along with depression, is 3 to 6 times more than patients without signs of depression (Bush, Zeigelstein, Tayback, Richter, Stevens, Zahalsky & Fauerbach, 2001; Surtees, Wainwright, Luben, Wareham, Bingham & Khaw, 2008). Various hypotheses have been presented regarding the mechanism by which depression affects critical state of disease and mortality caused by it. Amongst these hypotheses are behavioural changes in protecting oneself, decrease in treatment alliance and life quality (Williams, 1994), increase in risky behaviours such as smoking and alcoholism and losing motivation for cardiac rehabilitation (Barefoot & Schroll, 1996), decrease in heart rate variability (HRV) (Frasur-Smith, Lesperance & Talajic, 1995), alterations in immune system and increase in thrombogenicity (Braunwald, E., Zips, D., Libby, P., 2001).

Despite verifying destructive impacts depression imposes on heart issues and its deadly consequences in different studies, few researches have been implemented on identifying depression in these patients. Some of the studies on anticipators of depression in coronary heart patients have addressed following factors: psychological variables such as illness perception (illness identity, consequences, controllability/curability, duration and causes) (Bagherian, Gilani, Bahrami, Besharat and Saneei, 2007; Grace, Krepostman, Brooks, Heather, Scholey, Suskin, Jaglal, Abramson & Stewart, 2005), coping strategies (Monirpoor, Khosefi, Poorkhosrovani and Poorkhosrovani, 2009; Elderen, Maes & Dusseldorp, 1999), type D personality (Martens, Smith, Winter, Denollet & Pedersen, 2008), social support (Frasure-Smith, Lesperance, Gravel, Masson, Juneau, Talajic & Bourassa, 2000), cardiologic variables like function of left ventricle, heart rate variability (Joost, van Melle, de Jonge, Crijns, van Veldhuisen and et al., 2005), immunity variables such as IL-1, IL-6, C-reactive protein (Carmine, Manzoli, Mancini & Costa, 2008) and environmental variables like life events (Moosavi, Eslami, Sheikh Begloo & Birashk, 2004).

Up to the minute, most of the researches have addressed depression predictors in these patients but there are just a few examining specifically structural relationships of predictor variables. Lately, some theoretical models such as Leventhal and his colleagues’ self-regulation model (1985) have identified adaptation to chronic diseases. In this model it is hypothesized that when people confront a threatening disease, they respond on the basis of their perception of the symptoms or over social messages they get (like physicians’ or others’ judgments); these representations include individual’s insight into the nature of the disease, it’s consequences and causes, it’s curability and controllability and it’s effect on individual’s life. If they found their disease as threatening, severe, having long-term and critical consequences, incurable and uncontrollable, they will experience a great deal of anxiety. In parallel with cognitive insight, there exist a number of emotional factors caused by the disease. The emerging stress motivates the person to commence utilizing coping strategies. The purpose of applying coping skills is returning to the primary homeostasis and regaining health. The effectiveness of coping mechanisms will be assessed after performing them. Provided that the strategies prove to be successful, the patient will be back on his psychological balance; and if not, he may encounter severe psychological and bodily outcomes. One of the main emotional states emerging due to this
process is depression. Therefore the self-regulation model of adaptation with a medical disease such as coronary heart disease consists of three phases: 1) explaining and interpreting the disease and moulding patient’s understanding of it, 2) coping with the disease and 3) assessing coping skills’ effectiveness (Agden, 2004). This model addresses structural relationships between disease perception and its psychological symptoms such as depression, in which coping strategies play the mediator role. Hence this article outlines structural relationships between disease perception, coping strategies and depression after implementing CABG and PCI interventions, according to self-regulation model. The conceptual model adapted from Leventhal self-regulation model is shown in figure 1.

**Figure 1:** conceptual model to explain depression

In order to examine the above conceptual model, structural relationships between various variables will be scrutinized separately first, and later they will all be analyzed as a whole. Numbers written down on each path in figure 1, indicates sequences of relationships to be analyzed.

**Method**

**Participants**

This study was carried out on the basis of cross-sectional method. Participants were all coronary heart patients who had paid a visit to Tehran Heart Centre for the first time and whose disease had been diagnosed. Though the first 4 months of studying base-line, from overall 950 patients who had been interviewed, a number of 245 (143 under CABG and 102 under PCI) met the criteria for inclusion in the study. Therefore the sample consisted of 245 patients chosen through convenience sampling.

As far as ethics concern, participants were asked to study the research’s aims and additional information. Then, they complete consent form if they accepted participation. Also, researcher prepared some facilitates like cognitive and behavioral educations and interventions on the based on the study findings to promote their illness perception and coping strategies against their diseases.

**Measures**

**Beck Depression Inventory for Primary Care (BDI - PC).** An inventory designed by Beck and his colleagues which is used in medical centres as a screening tool excluding bodily items from the main questionnaire (Parker & Gladstone, 2004; Wilhelm, Kotze, Waterhouse, Pavalovic & Parker, 2004). This 7-item scale fits in with the 4th edition of Diagnostic and Statistical Manual of Mental Disorders Text Revised (DSM-IV-TR) criteria for clinically diagnosed depression (American Psychiatric Association, 1994). Beck, Steer, Ball, Ciervo & Kabat (1997) confirmed its psychometric qualities. Also the psychometric measures were separately examined in an Iranian sample of 176 patients inflicted by MI; Cronbach’s Alpha was estimated 0.88 representing its internal consistency. Furthermore its coefficient reliability was estimated 0.74 in a sample of 62 patients based on test-retest method in a period of 3 weeks. The scale’s construct validity was calculated 0.84 through comparing with the Iranian version of Anxiety and Depression Inventory subscales in the hospital (Montazeri, Vahdannia, Ebrahimi and Jarvandi, 2003) in a sample of 176 MI patients. Altogether results from psychometric qualities on Iranian samples indicated that this scale has a high quality and good diagnostic ability in differentiating depressed medical patients from those who are not depressed (Bagherian, et al., 2007).

**Coping Inventory for Stressful Situations (CISS-21).** This scale was made by Endler & Parker (1999) in the purpose of assessing people’s coping
skills in stressful situations like being inflicted by chronic diseases. The 21-item inventory assesses three categories of coping strategies: problem-focused, emotion-focused and avoidance-focused strategies. CISS is a valid and reliable scale for evaluating general coping strategies in samples of adult patients suffering from chronic diseases (Calsbeek, Rijken, Henegouwen & Dekker, 2002). Calsbeek, Rijken, Henegouwen & Dekker (2002) surveyed the scale’s psychometric characteristics in a sample of 521 patients suffering from chronic digestive diseases (including inflammatory bowel disease, chronic liver disease, congenital digestive diseases and food sensitivity). Cronbach Alpha for all the scales in every group of patients was estimated 0.79 to 0.86. Analyzing verification factor using LISREL software, confirmed the inventory’s three-factorial structure. Nonetheless this inventory hasn’t been yet applied in Iran.

**Illness perception Questionnaire (short form).**
This inventory is a summarized version of Disease Perception Questionnaire which covers all cognitive aspects proposed in Leventhal’s self-regulation theory. Apart from its comprehensiveness and summation, this scale evaluates patient’s perception of the severance of his disease. Scores to each scale (with the exception of the 9th one), ranges from 0 to 10. It provides an indicator of the patient’s insight into the severance of his disease. Bagherian, et al (2007) examined its psychometric characteristics on Iranian samples separately. Cronbach Alpha in a sample of 176 Iranian MI patients was calculated 0.84. Its test-retest reliability was estimated 0.68 in a sample of 62 cardiac disease patients in a period of 3 weeks. Besides, the sub-scale’s construct validity was calculated through comparing to Iranian revised version of Illness Perception Inventory (Arizi, et al., 2005) in a sample of 62 cardiac patients. The correlation coefficient between the two inventories was assessed 0.71.

**Data Analysis**
Structural equation modeling was used to examine conceptual models hypothesized by researcher. In all models post-CHD depression entered as final ETA and Illness perception entered as KSI. Copping strategies entered as final ETA in 2nd model and as mediator ETA in 4th model. Several goodness of fit indexes were used in all models.

**Figure 2: Sectional structural relationship between coping strategies and depression (the red line means related path is not significant)**

**Table 1: Models Indexes of Goodness of Fit**

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Results

As indicated in Figure 1, this model consists of 3 parts identified by numbers 1, 2 and 3. Hence first each component has been examined through 3 different hypotheses, and later the model was evaluated wholly.

1) Coping strategies predict depression after being inflicted by CHD in patients receiving CABG and PCI.

As it appears in Table 1, the above model has an acceptable goodness of fit, but the path from avoidance strategy to depression is not significant ($T = -1.41$). As the coefficient correlations are indicated on the paths, coping strategies determine overall 45.30% of depression variance; with emotion-focused strategy having a positive correlation with depression predicting 40% of it, problem-focused strategy with negative correlation 4.5%, and avoidant strategy having a negative correlation 0.8%. Altogether, results indicate that coping strategies, specifically emotion-focused and then problem-focused strategies have significant impact on depression after CHD in patients receiving CABG and PCI interventions at the baseline.

2) Illness perception, directly predicts coping strategies in patients receiving CABG and PCI.

The model holds an acceptable goodness of fit. All the directions connecting patients perception to coping strategies are significant in this model. Illness perception has a positive correlation with emotion-focused variance and determines 50% of it; meaning the more negatives the perception, the more the patient applies emotion-focused strategies. Illness perception has negative correlation with problem-focused strategies and determines 7% of it; it also has negative correlation with avoidance variance predicting 8% of it. Hence when the negative perception intensifies, the patient exploits more of problem-focused and avoidance-focused strategies. Therefore illness perception in coronary heart patients undergoing CABG and PCI at the baseline, predicts coping strategies specifically emotion-focused strategies significantly.

3) Illness perception can directly predict depression after CHD in patients undergoing CABG and PCI.

This model has an acceptable goodness of fit. Illness perception has an effective and meaningful role in identifying depression after CHD at the baseline which predicts 60% of it. Other than that the direction of correlation is positive; meaning the
Table 2: Model’s Indexes of Goodness of Fit

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<th>RMSEA</th>
<th>Standard RMR</th>
<th>RMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.081</td>
<td>13</td>
<td>20.57</td>
<td>0.049</td>
<td>0.95</td>
<td>0.98</td>
<td>0.45</td>
<td>0.032</td>
<td>0.17</td>
<td></td>
</tr>
</tbody>
</table>

Table 4: Model’s Indexes of Goodness of Fit

<table>
<thead>
<tr>
<th>p-value</th>
<th>df</th>
<th>Chi-Square</th>
<th>RMSEA</th>
<th>GFI</th>
<th>AGFI</th>
<th>PGFI</th>
<th>RMSEA</th>
<th>Standard RMR</th>
<th>RMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.073</td>
<td>59</td>
<td>108.90</td>
<td>0.059</td>
<td>0.61</td>
<td>0.90</td>
<td>0.94</td>
<td>0.050</td>
<td>0.27</td>
<td></td>
</tr>
</tbody>
</table>
more negative the perception, the more intensifying the depression.

4) In examining the whole model, it was concluded that illness perception can directly and through coping strategies, predict depression and anxiety in coronary heart patients undergoing CABG and PCI interventions at the baseline.

This model proved to have a very acceptable goodness of fit. Illness perception can directly and through coping strategies, predicts depression in coronary heart patients undergoing CABG and PCI interventions. Illness perception is able to directly determine 26% of depression variance, predict 4.5% of it through emotion-focused strategies and 0.25% of it by problem-focused strategies. Total estimation of direct and indirect impact of illness perception, equals 30.75%. As a matter of fact, more negative disease perception is resulted by utilizing much of emotion-focused strategy and less usage of problem-focused strategies, which leads to intensifying depression.

Overall, the results suggest that in the baseline, illness perception can strongly and directly predict depression; and its partial impact on depression after CHD in patients undergoing CABG and PCI, is imposed through coping strategies specifically emotion-focused strategies.

Discussion

Considering the variety of influential variables on the etiology of depression after being inflicted by medical diseases like coronary heart diseases, and taking into account the interference of depression symptoms with bodily manifestations caused by the disease; studying etiology of depression in chronic medical patients has entered a new era of research. Albeit some researchers have been lately attempting to contain psychological disorders caused by chronic medical diseases in conventional cognitive-behavioural models, researches in this region are looming ahead. Regarding the significance of the impact depression imposes on obnoxious consequences of heart diseases, especially after undergoing a surgery or percutaneous, this study have been examining one of the cognitive models entitled Leventhal self-regulation model for the first time in Iran.

Results implied that in the period right after undergoing CABG and PCI, exploiting coping strategies would significantly predict depression. Although avoidant coping strategies had a negative correlation with depression, wasn’t able to considerably predict it in that period of time. In fact direction of the paths implied that applying more of the emotion-focused strategies, accompanied intensified depression; while exercising much of problem-focused and avoidant-focused strategies, resulted in reduction of depression.

Outcomes of this study concerning the relations between approach coping (emotion-focused and problem-focused) was consistent with Sheer and his colleagues’ research (1989) on approach behaviours before and after CABG. They concluded that when coping behaviour is concerned with emotional issues (emotion-focused), it has a negative correlation with well-being; while if the coping behaviour regards planning and achieving aims (problem-focused), it has a positive correlation with well-being. In another research conducted by Holahan, C.J., Moos, R.H., Holahan, C.K., & Brennan, P.L. (1995), it was concluded that approach or active coping, foretells fewer depression symptoms in heart disease patients.

In spite of the fact that avoidant coping strategies couldn’t significantly predict depression, however they had a negative correlation. In fact applying avoidant strategies accurately after being afflicted by coronary heart disease and undergoing a surgery, decreases severity of depression. These results are consistent with a number of meta-analytic researches. For instance, Mullen, B., & Suls, J. (1982) and Suls, J., & Fletcher, B. (1985) concluded based on various meta-analytic studies, that avoidant strategies in short-term along with approach coping strategy in long-term can lead to effective adaptation with

Perhaps one of the reasons for insignificance of avoidance impact in predicting depression is associated with patient’s unavoidable circumstances accurately after undergoing a surgery or percutaneous coronary intervention. In these circumstances, patients take their symptoms seriously and the pressure these signs and consequences imposes on them, prevent them from avoiding the disease. However there exist some other possible explanations. For instance it sounds like the items in CISS-21 assessing avoidance coping construct, are not capable of evaluating some prevalent avoidance behaviours in Iranian patients suffering from cardiac diseases undergoing surgery. There exists the same problem with other strategies; as an example, religious coping strategies are among most widespread coping mechanisms in Iranian religious culture. Besides, listening to music, playing with cell-phone and similar behaviours are pervasive avoidance behaviours amongst these patients. On the other hand the avoidance behaviours which are assessed in this inventory can be regarded as emotion-or problem-focused as well. As an instance meeting a friend can be considered as a way of receiving some sympathy (emotion-focused) or gaining required information or tools for solving a problem (problem-focused). Anyhow results of the present study shows that applying emotion- or problem-focused strategies following undergoing a surgery, can directly impact depression; with emotion-focused coping strategies having greater effect.

Outcomes regarding the relation between patient’s illness perception and depression indicated that these two variables have a positive and meaningful relationship. When illness perception is exclusively applied as the predictor variable of the model, is able to predict 60% of depression. This conclusion verifies the significance and effectiveness of cognitive variables concerning disease in the resulting consequences. These findings support Grace, Krepostman, Brooks, Heather, Scholey, Suskin, Jaglal, Abramson & Stewart (2005) research. These researchers examined the relationship between illness perception, depression symptoms and gender differences in 661 patients suffering from acute heart syndrome and found that there is a meaningful relation between disease perception and depression. In addition, Koutantji, S., Pearce & Harrold, E. (2000) examined the relation between disease perception and depression and concluded that regarding the disease as severe has a relationship with depression. Husain, Dearman, Chauhdry, Rizvi & Waheed (2008) likewise studied the relationship between illness perception and depression; they indicated that when the patients hold their disease as having ample symptoms as well as severe consequences and uncontrollability, they show to have intensified depression. Overall all these findings suggested that having a pessimistic perception of the disease, can perceptibly predict depression symptoms in these patients.

This study proved that besides residing a direct relationship between perception of the patient and depression, these variables hold an indirect relation with coping strategies engaging as mediator variable. Illness perception can directly determine 49% of emotion-focused coping variance, and 4.5% of depression variance through emotion-focused
strategies. The direction of this relationship showed that the more pessimistic the insight, the more the patient applies emotion-focused strategies, and as a result the more intensifying the depression. Also, perception predicted 6.5% of problem-focused coping variance directly and determined 0.25% of depression variance through it. Although illness perception could directly and meaningfully predict 5% of avoidance coping variance, avoidant coping strategies didn’t have a significant role in mediating the relationship between illness perception and depression.

The mentioned results support Leventhal’s self-regulation model in predicting psychological adaptation. Therefore the more pessimistic the patient’s perception, the more intensified the depression. In addition, having a pessimistic illness perception would intensify the patient’s anxiety and confront him with more challenges and threats and consequently make his adaptation much harder. This condition leads to stimulation of coping strategies and therefore escalating the depression. Provided that the individual’s coping skills is sufficient and he applies solution-focused strategies, his unpleasant emotional states like depression would decrease. Nevertheless if his coping resources are inadequate, his perception of the disease can result in applying ineffective emotion-focused strategies like self-blame and consequently lead to depression.

**Conclusion**

Taken altogether, results of this study are consistent with Leventhal’s self-regulation model on psychological adaptation to chronic medical disease. It should be noted that in spite of the fact that coping strategies have an impact in mediating patient’s illness perception on depression, illness perception indicated to have a much greater impact exclusively. Therefore despite all the limitations of this study, precious findings have been achieved. One of the restrictions was infeasibility of controlling previous cognitive vulnerabilities, since vulnerable cognitive styles can lead to distorted perception of the disease. Besides, a number of influential variables on patient’s illness perception were not controlled; these included personality characteristics, extent of social support, severity of symptoms experienced and the onset of the disease. Nevertheless former depression was controlled to a great extent through clinical interview with patients.

In spite of the mentioned limitations, valuable conclusions were drawn. Regarding the results, it appears that illness perception, as a cognitive variable, has an effective impact on psychological consequences like depression. Since patient’s experiences and his interpretation of them is one of the resources in moulding his understanding of the disease, it is recommended that physicians clarify the clinical symptoms as much as possible and provide realistic medical interpretations to the patient. In order to prevent inaccurate cognitive understandings, it is necessary that physicians and nurses offer information about the diagnosis, treatment, disease duration and its consequences. As has been emphasized in Leventhal’s self-regulation model, patient’s friends and acquaintances as well form a dimension of his perception of the disease. Particularly during hospitalization patients occasionally receive a wide variety of contradictory information from other patients. As an instance, one the prevalent consequences of treatment interventions among heart disease patients is decline in sexual functionality. Many patients are very apprehensive about it and some declare it as a longstanding illness; or even some of them commence drug using in the hope of reopening the vessels, on the basis of their peers’ recommendations.

Despite the significant role of cognitive variables in emergence of depression and other psychological issues, it hasn’t been adequate attention drawn to it. Hence it seems that receiving psychological counselling and even in some patients, going through psychotherapy is essential. Considering the inadequacy of time for moulding the patient’s
perception, and the possibility that a critical period may emerge through this process, it is recommended to apply cognitive approach for patients suffering from heart diseases. On the other hand, holding group sessions for patients can help decrease utilization of ineffective emotion-focused strategies while simultaneously enhance the patients’ emotions. Besides, providing emotional support can lead to more efficient adaptation with the disease. To be capable of controlling their symptoms, some patients require receiving direct cognitive and behavioural education, and these results in the promotion of practical skills for coping with the disease.

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Prediction of family performance of married MS patients based on psychological indexes and mediated by moral foundations and spiritual experience

Hooman Namvar1*; Mohammad Ali Sahraian2

Abstract

Objective: The purpose of this study is to create a conceptual empirical model and develop a causal model that is able to explain overall performance of MS patients’ families and provide a scientific and empirical basis to Iranian culture to identify the psychological indexes of hardiness, hope, and resiliency, as well as the mediator role of moral foundations and spiritual experiences involved in family overall performances among patients’ spouses.

For this purpose, using non-random sampling method, 220 subjects were selected out of all patients with MS and their spouses in two cities of Tehran and Karaj in 2014-2015. They completed the questionnaires of Family Assessment Device, Hardiness Scale (Kobasa, 1990), Connor-Davidson Resilience Scale, Snyder Hope Scale, Daily Spiritual Experiences Scale, and Moral Foundations Questionnaire (Hythe & Graham, 2007) personally and non-personally. In order to analyze the data, common methods of descriptive statistics, structural equations, path analysis, and multiple regression were used and the data were analyzed using the software packages of SPSS and LISREL. The results showed that hope was determined as the variable that predicts family overall performance with a good effect coefficient. The other important finding about the model was that the path from the mediator variable of spiritual experiences towards family overall performance was not direct, that is spiritual experience was effective on moral foundations and moral foundations in turn was the most effective path to family overall performance.

Keywords: Psychological indexes, Family performance, MS patients’ spouse, Spiritual, Moral

Introduction

Family, as one of the important components of society and the smallest social unit, where an individual gains their first life experiences, has always been considered crucial by experts and researchers of human sciences, especially psychologists, consultants, and sociologists (Goodarzi et al., 1387). It can be said that family performance plays an important role in the normal and abnormal growth of individuals (Golchin et al., 2001).

One of the family’s duties is to act in emergencies. The region of duty is defined as facing crises that may occur during a disease, accident, loss of income, changing jobs and so on (Haghshenas, 2008).

Pazili et al. (2004) showed that care of people about MS leads to a reduction of life satisfaction and
life quality of caregivers in comparison with public population. In addition, the amount of depression in caregivers is linked with physical and mental states of their patients (Hurst, 2005).

In the three dimensional approach of biological, psychological and social anglesthe following methods can be used to deal with the important dimensions to enhance and maintain their life quality and performance in each of these dimensions (their extension will later make six dimensions of biological, psychological, social, cultural, spiritual and moral in order to investigate efficient families with respect to the fact that a chronic and progressive patients have shadowed their lives). In fact, in order to develop thePredictive model with the exploratory method, one of the variables of various dimensions should be addressed, which here are at least the three dimensions of psychological, spiritual, and moral.

We intend to address at least four features in the psychological dimension. Variables to be studied in the psychological dimension are hardiness, resilience, and hope.

Hardiness is a concept that originates from philosophy and was developed by Suzan Kobasa (1979). It is an attitude consisting of three sub-components of commitment, control, and challenging which helps the successful resolution of anxiety by changing critical conditions to a progressive experience (Ghorbanali, 2010).

Researchers, such as Voget et al. and Lambert, showed that people with high hardiness do not get sick in stressful conditions. Hard people are deeply involved with life activities and dominate life complexities. They believe that their life is targeted, are not passive spectators, and take responsibility to give meaning to their life.

Edwards Bergman’s studies (2008) showed that hardiness, while creating resistance against stress and suitable coping strategies, increase hope among people. The issue indicates more compatibility of hopeful people with stress and their ability to adjust stressful events. Some studies have investigated the relationship between variables of hardiness, life satisfaction, and hope with academic performance (Bidokhti & Erfani, 2001).

Resiliency, as one of the components of positive psychology, plays a role in mental health and has been defined as the talent to remain healthy while confronting negative events and flexible confrontation with life challenges.

According to Connor, adjusting and compromising factors such as stress, depression, and resiliency guarantee peoples’ well being. Studies show that resilient people who do not have self-breaking behaviors are emotionally calm and have the ability to cope with terrible conditions (Maddah Karani, 1392). A study addressing the effect of teaching resiliency on MS patients’ psychological well-being showed that teaching resiliency has been meaningfully effective on MS patients’ psychological well-being in the areas such as autonomy, self-acceptance, objective and orientation, environmental mastery, personal growth, and positive relation with others (Shirin, 2012).

Finally, the important variable of psychology area which is very important for the continuation and solidarity of married life is hope. Stuttland (1969) defines hope as a kind of imagination of probability of achieving a goal, which is more than zero. Nunn (1969) presumes the hope as a general tendency to build the future and a positive response to the perceived future (Snyder & Etal, 1994).

Adults and children can hopefully create more methods for reaching their goals. Some researchers believe that the concept of hope is a kind of concept that is related to adaptability, faith, and capability that can be regarded as an effective response to stressful factors by making current situation tolerable. Hope strengthens the physiological and psychological functions and lack of it leads to premature failure of an individual’s performance (Brairwaiate, 2004).

In addition to the very important and sensitive dimension discussed earlier, the of spirituality in confronts the difficulties of life is cultural foundations
the majority of which is spirituality linked to an eternal source that should not be ignored. One of the probabilistic components affecting psychological well-being is religion/spirituality (Maddah Karani, 2012). Many researchers, such as Denise, Walt, Meewen, Wong, and Yang showed that when confronting with damage, people with spiritual tendencies respond better to its internal situation, manage the pressure producer better, and have better health conditions. In addition, spiritual tendencies and being religious result in the enhancement of psychological well-being and mental health (Hales & Fracis, 1999).

In the end, morality is regarded as one of the most important human dimensions and the foundations related to it as the capability to use world ethic principles regularly in a person’s goals and dealings. From perception point of view, judging good and bad deeds originates from world principles and passes from all cultural barriers. One of the important codes of ethics of all cultures is to diagnose responsibility and being able to face and sympathize with others. A majority of religions in the world have also considered common values such as commitment, responsibility, respect, and dignity of other human beings (Rafati, 71).

In the study of Sadeghi and Samani (2011), it was specified that there is a positive and meaningful relationship between the quality of marital and sexual relations, on the one hand, and ethical considerations and life satisfaction of couples on the other hand. The considerable finding of the study of Johnson et al. indicates that ethical commitment results in the stability and sustainability of couples’ marital relations (Asghari, & Ghasemi Joobneh, 2012).

Family is the first barrier and the strongest mainstay for the welfare of its members. When a member becomes ill, it is likely that all family members are sick. The people involved may not be able to participate in activities that they previously enjoyed for a long time and the dynamic and mobility of family is often changed (Sadat et al., 2006).

Family and especially spouses have been introduced as the best source to take care of patients with MS. If caregivers have sufficient support and facilities, they can gladly support the patient with MS materially and spiritually. However, the duty becomes unbearable in real situations. The burden of balancing jobs, economic issues, care for children and increasing jobs at home on the caregivers will have consequences such as family isolation, despair of social support, disruption of family relationships and inadequate care of patients, and finally abandoning patients (Millbury, 2013; chang, 2010; utne, 2013).

In spite of prevalence of MS patients and the potential pressure on their caregivers, so far the issue has not been of interest to researchers in Iran and no documentary and official facts and figures are available in this regard. Considering the author’s experience in facing with problems of caregivers of patients with MS, the importance of the issue and lack of domestic studies on this subject, the researcher aimed to take a step towards this important issue. Development of a predictive model for family performance and involving patients’ families is one of the researcher’s suggestions. In this way, it may be possible to reach a comprehensive local model with cultural and spiritual factors for all chronic diseases that necessarily need the care of all family members and more importantly their spouse.

In the end, we need to answer the question of whether it is possible to explain the relationship between psychological indexes (hardiness, resiliency, and hope) and the spouse’s family performance of patients with MS considering the mediator role of moral foundations and spiritual experiences.

Method

The present study has been carried out based on a correlation oriented causal model to determine possible causal relationships between variables based on structural equations modeling.

Based on the above theoretical and empirical foundations, a model has been developed in this study
to explain the family performance for the spouses of patients with MS to not only develop a suitable model but also perform necessary adjustments on the obtained findings and theoretical texts and foundations to achieve the fittest explanatory model for the family performance of these patients. The most general form of the model is shown in figure 1.

Figure 1. The conceptual model of explaining family overall performance

As it is seen in figure 1, in the above model, psychological indexes (hardiness, resiliency, and hope) are assumed as independent or extrinsic variables which affect family overall performance as dependent variable (intrinsic) via two variables of moral foundations and spiritual experiences as mediator variables (intrinsic).

Statistical population and sample group

The target population of the study includes patients with MS and their spouses in the two cities of Tehran and Karaj. Based on the study plan and non-random sampling method, the study sample group was selected in three steps as follows.

At first, in order to reach the target group, MS Research Center of Iran, MS Society of Tehran, MS Society of Karaj, and support community for MS patients were selected as the main clusters for determination of the sample group. The population volume was investigated in these centers and was estimated above 6500 people. In the next step, in order to popularize the sample group more, the data of the private office of Dr. Mohammad Ali Sahraeian were also entered into the statistical population.

- In the third step, in order to select the final group, 300 of patients’ spouses who had the entry criteria and volunteered to participate in the study beforehand were selected based on non-random sampling. Because of the group special condition with the possibility of not returning questionnaires packages, the sample volume was selected more than needed. The sample volume was determined for causal plans and 1 to 20 formula modeling (Clain, 1998; Bentler, 1990). In other words, at least 20 subjects were considered for each variable entering the model. Since the number of variables of the study was six for the most general model, the sample volume of 200 people would be suitable to implement and fit the model. The sample group was selected based on the following inclusion criteria: 1) Diagnosis of a neurology expert doctor to be sure a person has MS, 2) Being married, 3) Lack of psychiatric and psychological interventions in the past year for the patient and their spouse.

Ethical Considerations

- He is patient with complete satisfaction.
- Patient information will be kept strictly confidential.
- The Other ethical cases will be considered based on Helsinki statement.

The Family Assessment Device

Family assessment device is a sixty-item questionnaire which has been developed based on Mac master model of family function by Epstein, Baldwin, Bishop (1983) to evaluate the family performance. In order to add the reliability of the tool, 7 items were added to three sub-scales of the primary 53-item version. The tool scoring is carried out based on a four score scale of I agree completely, I agree, I disagree, and I completely disagree and it can be answered by family members who are above 12 years old. The tool includes the following sub-scales based on the dimensions of Mac master.

Psychometric properties

The validity of the questionnaire was investigated by Mohammadizadeh and Malek Khosravi (1385) in Iran and Cronbach’s alpha coefficient of sub-scales was obtained as follows: problem solving: 0.72, relationship: 0.70, roles: 0.71, affective involvement: 0.73, emotional response: 0.71, behavior control: 0.66, and overall performance: 0.82. Its differential and simultaneous validity coefficient were also calculated and reported favorable.

The differential reliability of the tool was also obtained with a meaningful difference between family assessment device scores of students and those whose one of relatives (sister, brother, child, father, or spouse) were hospitalized in a psychiatric hospital. The findings of another study on seniors (60 to 69 years old) also showed that there is a meaningful correlation between this tool scores and marital adjustment scale, which indicates the simultaneous validity of the test (Yousefi, 1391).

The validity coefficient of the tool is as follows: (problem solving: 0.68) (Relationships: 0.57) (Roles: 0.63) (effective responsiveness: 0.67) (effective conflict: 0.77) (behavior control: 0.79) (overall performance: 0.70)

Hardiness scale

Hardiness inventory (Kobasa, 1990) is a 50-item questionnaire which includes 3 sub-scales of commitment (16 items), control (17 items), and challenging (17 items) and is scored in a 3 point scale. Commitment/Control/Challenging (Hekmatpour, 1383).

Psychometric properties

Maddi’s findings (according to Kosaka Mamoritaka, 1996) confirmed the above three scales by the factor analysis and reported an acceptable reliability and validity for hardiness inventory. The data analysis showed that the validity coefficients of sub-scales of commitment, control and challenging...
(challenge) is respectively 0.70, 0.52, and 0.52 and for the whole hardiness inventory is equal to 0.75. Fank (1992) has also obtained the validity coefficients for the scales as 0.79, 0.78, and 0.64.

The questionnaire has psychometrically been examined by Ghorbani (1373) in Iran and the validity coefficients for control, commitment, challenge and the whole hardiness feature has been obtained as 0.70, 0.52, 0.52, and 0.75 respectively.

The study of Najjarian (1380) has obtained alpha coefficient for the whole sample, girl subjects and boy subjects respectively equal to 0.76, 0.76 and 0.74. The validity of retest was obtained for the whole sample as 0.84 after six weeks.

In order to evaluate the reliability of hardiness tool, Kobasa (1998) has calculated its correlation with Back depression questionnaire and general health questionnaire and obtained r=0.73 and r=0.59 respectively. The results of the factor analysis to investigate the reliability in Iran have also confirmed the existence of the three factors (Mikaeili, 1392).

The validity coefficient of the tool is as follows: (challenging: 0.54) (commitment: 0.83) (Control: 0.75) (total score: 0.86)

Connor-Davidson Resilience Scale

Reviewing research resources in the time period of 1979-1991 on the area of resiliency, Connor-Davidson resilience scale (2003) was prepared. The questionnaire has 25 items which is scored in a six point scale between zero (totally incorrect) to five (always correct).

The results of the factor analysis indicate that the test has five sub-scales: 1) The notion of individual fitness, 2) Trusting individual’s instincts/tolerating negative emotion, 3) Positive acceptance of change and secure link, 4) Control, 5) Spiritual effects (Ghorbani, 1391).

Psychometric properties

Investigation of psychometric properties of the scale in six groups of general population, refers to primary care section, psychiatric outpatients, patients with problem of generalized anxiety disorder and two groups of stress patients after an accident, shows that the results have been very good and have had high discrimination validity which can be used in research and clinical situations. Validity of Connor and Davidson has reported the scale Cronbach’s alpha coefficient as 0.89 and the retest validity coefficient in a four week period as 0.87 (the same reference).

The scale has been normalized by Mohammadi (1384) in Iran and the validity coefficient has been reported as 0.89 by Cronbach’s alpha method. On the other hand, its correlation with hardiness scale of Kobasa has been positive and meaningful while it has been negative and meaningful with the perceived stress and vulnerability scales with respect to Shyhan stress. In addition to that, it didn’t have any meaningful correlation with the scores of Arizona sexual experience scale before and after the experience. The issue indicates its discriminative reliability (the same reference). The validity coefficient of the tool is as follows: (positive acceptance of change and secure link: 0.81) (The notion of individual fitness: 0.83) (Trusting individual’s instincts/tolerating negative emotion: 0.77) (Control: 0.74) (spiritual effects: 0.70) (total score: 0.76).

Hope questionnaire

Snyder hope scale (2003) evaluates an individual’s hope as a relatively constant personal characteristic (Khalaji, 1386). The test consists of 12 items and two sub-scales of agency thinking and Pathways thinking which is scored in an eight point scale from completely agreeing to completely disagreeing and the score ranges from 8 to 64 (Ghorbani, 1388).

Psychometric properties

Many studies indicate the validity and reliability of the questionnaire (Briant &Vangrost, 2004). The retest coefficient has been equal to 0.80 for periods longer than 8 to 10 weeks (Snyder & Lopez, 2007). The internal coordination coefficient of agency
thinking and pathways thinking sub-scales was respectively between 0.71 to 0.76 and 0.63 to 0.80 (Robelski and Snyder, 2005). Snyder et al. (2000) reported the total validity as 0.85 through retest and after three weeks, while it was equal to 0.81 and 0.76 respectively for agency thinking and pathways sub-scales. In another study on 18-21 year old students, the validity coefficient was respectively obtained as 0.76 and 0.88 for agency thinking and pathways sub-scales (Alexander & Onwuegbuzie, 2007).

Through Cronbach’s alpha, the validity of the test for Iranian students’ population has been respectively reported as 0.82, 0.79, and 0.88 for the whole scale, agency thinking sub-scale, and pathways sub-scale (Ghobari Bonab, Lavasani & Rahimi, 2007). In Khalaji’s study, the validity of the scale was respectively obtained as 0.70 and 0.74 through Cronbach’s alpha and retest after one month. In addition, the internal coordination obtained from Cronbach’s alpha was respectively reported as 0.74 and 0.62 for agency thinking and pathways thinking sub-scales (Ghorbani, 1388).

In a study, Kermani et al. (1390) reported the validity obtained from Cronbach’s alpha for the whole scale, agency thinking sub-scale and pathways thinking sub-scale as 0.86, 0.77, and 0.79 respectively.

The validity coefficient of the tool is as follows: (Hope: 0.86).

**Daily spiritual experience scale**

Daily spiritual experiences scale (Android & Tersi, 2002) was made to prepare a multi dimensional tool of spirituality so that it can effectively be used in health studies which examine various areas of religion and spirituality. The scale evaluates an individual’s perception of a superior force (Allah, God) in their daily life and of an interaction with the beyond of material world creature. In addition, it also measures the issue of how ideas and beliefs are a part of features of moments of life from a spiritual or religious perspective and includes concepts which are not limited to any special interest. Daily spiritual experiences scale has so far been translated to numerous languages and various studies have been conducted on it (Taghavi & Amiri, 1389).

The scale consists of sixteen items which evaluates concepts such as relationship, joy and a sense of excellence, power, comfort, God’s help, God’s guidance, receiving God’s love, sense of wonder, thanksgiving, love with compassion and feeling of closeness to God. Its short six item form has also been used in studies (Ibid).

Determination of the validity of the scale has been carried out using three methods of retest, splitting and internal coordination. Some studies have also been conducted on the reliability of daily spiritual experiences scale so far. Luke’s medical center in Chicago (Shahabi & Pawel, 1999) carried out a number of psychometric analyses of the 16 item form as a part of the study of women across the national scale in various locations and of various ethnicities. The findings of the studies indicated that daily spiritual experiences has a meaningfully positive correlation with Scheirer’s optimism scale (Scheirer,Carver, & Bridgs, 1994) and Berkman’s scale of perceived social support (Sieman & Berkman, 1988). Also, daily spiritual experiences were accompanied more with higher scores of short form-36 rating of quality of life (Mc Horni, Wier, Lou & Sherborn, 1994) (Ibid).

The validity coefficient of the tool is as follows: (Spiritual experiences: 0.91).

**Moral foundations questionnaire**

Moral foundations questionnaire (Hythe & Graham, 2007) consists of 30 terms which has been adjusted to evaluate and asses the five-fold dimensions. According to Hythe and Graham, these five dimensions are basic and fundamental dimensions of ethics in various ethnic, racial, and linguistic cultures and identities. Five sub-scales of the questionnaire are:

1)Care, 2)Damage, 3)Equity (justice), 4)Loyalty
to the group, 5) Respect for authority, and 6) Sincerity (Seifi et al., 1391).

In order to determine the validity of the questionnaire using retest method, 123 students of Southern California University having passed 37 days on average (with an amplitude of 28 to 43 days), values of 0.71, 0.68, 0.69, 0.71, and 0.82 were respectively obtained for the dimensions of care and damage, equity, loyalty to the group, respect for authority, and sincerity. The coefficients obtained through retest for each dimension were close to the coefficients obtained through Cronbach’s alpha. Analyses conducted by other scales, such as Schwartz values survey to determine divergent reliability, indicate that each dimension of the questionnaire has a strong predictive reliability (Seifi et al., 1391).

The total validity coefficient of the scale in the study of Seifi Ghozloo (1391), where 125 couple presented, was obtained as 0.79 using Cronbach’s alpha and it was respectively equal to 0.58, 0.79, 0.61, 0.70, and 0.73 for the sub-scales of care/damage, equity (justice), loyalty to the group, and respect for authority and sincerity, which shows the suitable internal coordination of the questionnaire. The validity coefficient of the tool is as follows: (Care: 0.61) (Equity: 0.60) (Loyalty: 0.66) (Respect: 0.57) (Sincerity: 0.71) (Total score: 0.90).

Data collection method

In the present study, questionnaires were developed as six forms and completed by the spouse of the person with MS. In order to collect data and implement the study, eight psychology students (five graduates and three undergraduates) were selected based on their individual experience and capabilities and having been taught the way of implementing and completing the study scales and how to communicate with patients, they completed the questionnaires.

Having consulted MS

Research Center of Sina Hospital, private offices, MS society of Iran in Tehran, MS society of Iran in Karaj, and Support Community for MS Patients in Tehran and obtaining the consent of the centers and participants, the questionnaires were delivered to them. Some participants completed the questionnaires on location and some others, due to physical conditions, completed them at home and delivered them by examiners’ telephone follow-ups.

Method of data analysis

In order to answer the research questions, the following statistical methods have been used:

- Statistical characteristics of groups and set of items of questionnaires were determined using common method of descriptive statistics,

- The validity coefficients of the questionnaires were estimated through calculation of internal coordination (Cronbach’s alpha).

- Path analysis was used to test the fitness of extended models of family performance.

- Pearson correlation coefficient and multiple regression were used to investigate the relationships between the study variables.

- The statistical methods were analyzed using the software packages of SPSS and LISREL.

Results

In order to investigate the causal relationship between explaining variables of family overall performance, structural equations model or covariance structural models were used. Based on these models, the hypotheses related to causal relations of variables can be tested. In other words, the structural equation model tests the relations between definite and assumed structural conditions. In order to extend and test the main study model, it was necessary to precede the following stages: 1- Investigating and making sure of the establishment of the assumptions of the structural equations model, 2- Investigating the regression relationship between the study variables, 3- Extending and testing the study model based on theoretical and empirical foundations.
1) Investigation the structural equations assumptions in the study model

In order to implement the structural equations, it seems necessary to make sure firstly that the statistical assumption of such models are established. In this section, the most important structural equations assumptions and how to meet them is described.

a) Measurement of variables in the gap level:
For this purpose, the raw scores obtained from the measurement of variables were converted to factor scores with a zero mean and unit standard deviation based on Anderson and Rabin’s method (1956, according to Hooman, 1384) and by the use of the LISREL software.

b) Low multicollinearity of extrinsic variables:
The results obtained from calculation of correlation coefficients (first order) between the studied extrinsic variables in table 10 indicate that the assumption of multicollinearity being low is established for the study models of the research because the highest correlation coefficient of the matrix has been obtained as 0.636 (between hope and resiliency).

c) The same distribution (homogeneity of variance) of intrinsic variables:
Since the present sample volume is big enough in comparison with the number of studied variables (200 people), one can also make sure that these assumptions are met. Because of observation of the main assumptions of the structural equations model, the process of data analysis and explanation of the model is presented later.

As it is seen in table 2, the correlation coefficient of hope and resiliency is higher than other variables (0.636). In addition, other important correlation coefficients which indicate a relatively good relation, is the relationship between resiliency and hardness (0.493) and the reverse coefficient of the relationship between hope and hardness (0.536). Other correlation coefficients are average or mild. What is quite clear is the weak and insignificant relationship between psychological factors and moral foundations and spirituality. Observation of other correlation coefficients in table 10 indicates that the range of these coefficients is relatively limited.

2) Descriptive statistics of the study variables

In this section, each of the study variables are separately analyzed from psychometric characteristics point of view so that the factors are examined based on social, cultural, and psychological features of the studied sample group and their final factor structure is determined for responding to the main question of this study. For this purpose, the following steps were respectively executed: 1) Calculation of characteristics of descriptive statistics of total scores, 2) Analysis of the scale questions based on statistical features of the items including mean, standard deviation, and diagnosis capability or correlation coefficientwhole scales, 3) Estimation of validity coefficients through internal coordination index (Cronbach’s alpha).

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Resiliency</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Hope</td>
<td>0.636**</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Moral foundations</td>
<td>-0.013</td>
<td>0.017</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Spirituality</td>
<td>-0.031</td>
<td>0.058</td>
<td>0.266**</td>
</tr>
<tr>
<td>5</td>
<td>Hardiness</td>
<td>0.493**</td>
<td>-0.536**</td>
<td>-0.90</td>
</tr>
</tbody>
</table>

**P<0.01
*P <0.05
Descriptive indexes

Descriptive indexes together with the test of distribution normalization of the study scales scores are shown in table 3.

Data on Table 3 shows that the overall performance does not obey the normal distribution, and has a positive skewness. The data indicate that the total score distribution is normal and the sample group members have reported their general hardness feature at a relatively high level. The kurtosis index (height) shows that the total score distribution has a kurtosis close to normal.

The data of the table indicate that the total scores of resiliency do not obey normal distribution and have a positive skewness, which shows that the sample group members have reported their resiliency feature at a relatively low level. The kurtosis index (height) also indicates a negative kurtosis which is more than normal distribution height.

The data show that the hope scale distribution obeys the normal distribution, while the scores of spiritual experiences scale does not obey the normal distribution and has a negative skewness, which indicates that the sample group members have reported their spiritual experiences feature at a high level. The kurtosis index (height) of spiritual experiences is nearly equal to the normal distribution, while the hope scale distribution is higher than the normal height.

The data indicate that the scores of spiritual foundations do not obey the normal distribution and have a negative skewness, which shows that the sample group members have reported their moral features at a relatively high level. The kurtosis index (height) of the distribution also shows that the height is less than normal distribution.

3) Examination of regression relations of the study variables

The relationship between moral foundations and spiritual experiences with family performance

For a better understanding of the relationship between the studied variables, especially the relationship between mediator variables (moral foundation and spiritual experiences) with dependent variables (family performance) and also the relationship between independent variables (predictive with mediator), multiple regression was used before implementing path analysis models. On the other hand, due to the predictive moral foundation and spiritual experiences with the score obtained from the family performance questionnaire, the regression method was also used. The results of the analysis are shown in Tables 4.

As it is seen in Table 4, the relationship of family overall performance is not meaningful through variables of moral foundations and spiritual experiences. Therefore it can be concluded that these two variables cannot affect family overall performance directly.

The relationship between psychological variables and spiritual experiences and moral foundations

In order to examine the relationship between
predictive variables and the variables of spiritual experiences and moral foundations, which play the mediator in the present study, the model of multiple regression has been used and its results are shown in Table 5.

As it is seen in Table 5, the value of variance determined for these two variables are respectively equal to 4.5% and 12.5%, which is relatively weak. Therefore predictive variables cannot predict any of two variables of moral foundations and spiritual experiences.

The relationship between psychological variables and family performance

In order to study the direct relationship between independent psychological variables and sub-scales of family performance, the multiple regression models has been used, the results are shown in Table 6. As it is seen in Table 6, among the predictive variables, the two variables of hardness and emotional difficulties have a meaningful regression relationship with the six sub-scales of family performance including: overall performance, problem solving, relations, roles, effective responsiveness, and effective conflict. The highest explanatory coefficient is related to overall performance with 28% and the lowest one to problem solving with 19%. However, the variable of behavior control is explained and predicted by the two variables of hardness and hope. The value of the coefficient is quite considerable and equal to 66%. On the other hand, other predictive variables do not have any meaningful relationship with the sub-scales of family performance.

<table>
<thead>
<tr>
<th>Variable</th>
<th>R2</th>
<th>β</th>
<th>B</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardiness</td>
<td>0.045</td>
<td>-0.092</td>
<td>-0.193</td>
<td>0.176</td>
</tr>
<tr>
<td>Resiliency</td>
<td>0.025</td>
<td>0.027</td>
<td>0.104</td>
<td></td>
</tr>
<tr>
<td>Hope</td>
<td>0.049</td>
<td>0.036</td>
<td>0.066</td>
<td></td>
</tr>
</tbody>
</table>

**P<0.01 *P<0.05

<table>
<thead>
<tr>
<th>Variable</th>
<th>R2</th>
<th>β</th>
<th>B</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardiness</td>
<td><strong>0.289</strong></td>
<td>-0.421</td>
<td>0.106</td>
<td></td>
</tr>
<tr>
<td>Resiliency</td>
<td><strong>0.181</strong></td>
<td>-0.137</td>
<td>0.063</td>
<td></td>
</tr>
<tr>
<td>Hope</td>
<td>-0.142</td>
<td>-0.74</td>
<td>0.040</td>
<td></td>
</tr>
</tbody>
</table>

**P<0.01 *P<0.05
4) Extension and testing the study model
As it is seen in figure 2, the effect path from spiritual experiences variable to overall performance variable through moral foundations ($\beta_1=0.23$) has been obtained meaningful. The effect of the variable of hope on overall family performance is indirect and through spiritual experiences and moral foundations. The effect of the two variables of hardiness and resiliency are the only ones with direct insignificant coefficient. Therefore, it can be said that the two variables of hardiness and resiliency ($\gamma_1=-0.13$, $\gamma_3=-0.63$) have direct effects on the overall performance and the variables of hope and spiritual experiences have indirect effects.

The square k index of the model is equal to 9.19 and is not statistically meaningful ($p=0.24$). The ratio of square k to degree of freedom (7) is less than 2 and equal to 1.31, which is in accordance with the acceptable criteria of Bayern (1989) and Bentler (1993).

The indexes of Goodness-of-fit Index, Comparative fit index, and Adjusted Goodness-of-fit Index are also equal to 0.99, 0.99, and 0.97 respectively which are significant and indicate the suitable fitness of the data. Root Mean Square of variance of Error Approximation for the model is also less than 0.05 (0.037) and based on credible criteria (Brown& Codke, 1993). It can be concluded that the degree of model approximation in the population is not large. Expected cross validation index is equal to 0.23, while this value is equal to 0.26 for the saturated model, which is in accordance with the criterion of Jorskg and Sorbon (2003).

In addition, the value of square of multiple correlation ($R^2$) for the studied model was obtained as 0.35, which shows that nearly 35% of sub-scale variance is explained by the study final model.

Conclusion
The main question of the study is whether psychological variables (hardiness, resiliency, and hope) as independent or extrinsic variables affect family overall performance through two variables of moral foundations and spiritual experiences as mediator (intrinsic) variables.

As it was said, the obtained results indicate that

![Figure 2. the diagram and path standard coefficients in the adjusted model of family overall performance](image-url)
the effect of hardiness and resiliency on family overall performance is direct and the effect of the psychological variable of hope is indirect because in the mentioned model, hope, passing through spirituality and ethics path, affects family overall performance. What is quite obvious is that among the psychological variables, the highest relationship is between hope, spirituality, and ethics. It means that the variable of hope originally has spiritual basis which are dependent on an individual’s meaning of life. Therefore the path from hope to spiritual experiences and moral foundations was a predictable path which was realized.

However, what seems as a very considerable point in this study is the path from spiritual experiences to moral foundations and family overall performance. It means that spiritual experiences and moral foundations are both regarded as equivalent mediator variables. In addition, the direct effect of spiritual experiences on family overall performance was not meaningful in the development of the model and it should have surely affected family performance through moral foundations.

What is also very important is that among effective paths with 35% of explanation coefficient, the path from hope to spiritual experiences and moral foundations and then the increase of family overall performance was quite notable.

Hardiness acts as a mediator between stressful events and sickness and reduces the possibility of disease symptoms outbreak. A hard person takes responsibility to make their life meaningful (Kobasa, 1979). Resiliency is a result of bargaining and interaction between people and their environment in disastrous and miserable conditions (Parto, 1389). Hope is the most important moral characteristic. Hope is regarded as a process of experience, a spiritual or supernatural process of reasonable thoughts and a communication process. Hope is an important spiritual need and is very significant for successful confrontation (Motamedi, & Mohammadabadi, 1388).

The results of the study indicated that there is a positive and meaningful relationship between hope to life and hardiness (Hosseini, 1388). In a study, Jo Ki Wi Kim (1997) realized that there is a relation between life quality and hope of cancer patients. Numerous studies have shown that hopeful people use cognitive strategies with positive self-talk, reading books full of moral and spiritual virtues, imagination of promising images, listening to spirit catching music and humor when tolerating pain and suffering from crises or negative events in their lives (Bahari, 1390). People with higher hardiness react more adaptively to stressful situations. In a study called the effect of teaching resiliency on mental well-being of patients with MS, Shirin (1392) demonstrated that teaching resiliency is meaningfully effective on psychological well-being of MS patients in the areas such as autonomy, self-acceptance, objectivity and orientation, environmental mastery, self growth, and positive relations with others. Resiliency is related to mental health, preventing symptoms of stress disorder from relapsing and becoming chronic after an accident, life quality and well-being (Connor, & Davidson, 2003). In addition, it can be said that mental health and hope play an important role in life satisfaction and mental adaptability (Jafari et al., 2010), and strengthening hardiness components, we can help people to manage their stresses (Izadi Tammeh, 1389). The results of the study was aligned with the studies of Taheri et al. in 2014, Jafari et al. in 2010, Grif and Derwalt in 2010, Yadav in 2010, Nooroddinv & et al. (1393), Shirin (1392), Najafi (1392), Zahedbabolan et al. (1390), Bahari (1390), Khosravi (1385), Werthington et al. (1997), Chen (1996), Hamid (1389), Hosseini, 1388, Ghorbani and Dejkam (1373) and Lambert et al. 1989 as was mentioned before, while it was not aligned with the studies of Seydi et al. 1390, and Garmezi et al. (1991).

Since hardiness, resiliency as well as hope and spirituality are effective on life quality and family performance, the effect of the model on the increase
of family overall performance through the increase of moral foundations is very significant and it should not be forgotten that this study was conducted on all patients with MS. Some of them are increasing divorce rate among couples one of whom has MS. The present study, which was done on the patients’ spouses, helps the single patient to find a suitable person for their future life and also those who are married and have a problematic marriage life. It is possible to improve family overall performance of patients with chronic disease and especially MS patients by enhancing spirituality that leads to the enhancement of morality in families and also by development of positive thinking psychological area such as hope and resiliency.

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Effectiveness of Acceptance & Commitment Therapy on Quality of Life in Elderly People with Age-Related Macular Degeneration Disease

Ziba Barghi Irani\(^1\); Hossein Zare\(^2\); Zohreh Pirhayati\(^3\)

Abstract

Objective: The goal of the present research is to determine the degree of the efficiency of group approach of ACT on the life quality of elderly people suffering from ARMD.

Method: The research is a semi-experimental study with the pre, post-test and experimental and control groups. The research population was the aging men and women suffering from ARMD selected from Karaj Nour-e-Didegan Ophthalmoology Clinic. The sample of the research was 28 people were chosen through random sampling method and divided into two experimental and control groups. The program of approaching based upon therapy through ACT in the collective form within 8 sessions of 120 minutes.

Results: The results were analyzed by studying the ANOVA with repeated measure and LSD and the result showed a significant meaning of the efficiency of ACT on sub scales of the life quality, physical sanity and psycho sanity. But no significant meaning was achieved to affirm the efficiency of ACT upon the environmental sanity. These effects did not persist on the process of follow-up.

Conclusion: With regard to the research findings, one can employ ACT to improve life quality of the aged people who suffer from ARMD.

Keywords: ACT, quality of life, elderly, ARMD

Introduction

Since aging is one of the inevitable phases of life and also the final phase of man’s evolution (Alipoor, Dajadi, Forozan, Biglarian, Jalilian, 2011); the augmentation of the life term and the issue of their dexterity has raised a serious question (Niksirat, 2005). In the recent years one of the measurable factors to determine the sanity needs and sanity circumstances is life quality. According to the definition of WHO, the life quality is man’s understanding of his own situation from the view of culture, value system, goals, expectations, criteria as well as his priorities. Therefore these factors are considered personal which are not distinguishable by others and mainly relies on the personal understanding of their own various aspects of life (Van Wichert 2008). The most
important aspect of the elderly sanity relates to their daily activities and the continuation of their life in active form.

Getting old intensifies the disorder of physical activities, and consequently, negatively decreases their ability of being independent and increases their need for help (Barry, 2000). Today the improvement of sanity of the handicapped people is regarded as a rehabilitation goal (Bullinger, 1991). The blind and semi blind people are among the handicapped people. According to the WHO (1995) the ratio of blindness among the people from the age of neonates upon 14 is 8 per 10000 people and by the rise of age the ratio will rise too; in such a way that the people who are at 60 are at risk blindness and semi blindness (Thylefors & Negrled, 1999). During the last decades there has been a lot of interest in the issues and challenges the blind people encounter. Recent studies have shown that there is a direct relation between the appearance of sight deteriorating diseases and the rise of age (Smith, 2010). In the developing countries most of the causes of blindness and semi blindness are cataract, glaucoma, retina diseases and infective diseases, while in the developed countries the sight disorder mostly originates from ARMD, retinopathy, and diabetic diseases (Al-Bdourf, Al Till, & Abu Khader, 2002; Weil, Van View Klik, Mccarty, & Taylor, 2000).

The most common reason for irrecoverable and irremediable blindness in the aged people over 65 throughout the world is ARMD (Holliday, Smith, Crones, Buitendijk, Jensen, & Sim, 2013). Because of this disease macula or the yellow spot will be degenerated. Macula is the section of the eye which is highly sensitive to the light of retina and responsible for the direct and clear sight which is necessary for carful activities, such as studying and driving (Parmeggiani, Sorrentino, Romano, Costagliola, Semeraro, & Incorvaia, 2013). The effect of ACT has been shown in the extensive range of clinical situations of behavioral and conceptual obsession, the stress of job environment, stress of the final phases of cancer anxiety, stress due to the incident, psycholackadaisical, drug abuse and even schizophrenia. A study has shown that only a four hour treatment of ACT for the people who suffered from schizophrenia has decreased the ratio of backing to hospital up to 50 percent. (Harris, 2014). In the method of ACT, it is assumed that men regard most of his passions, emotions and internal thoughts obnoxious and they ceaselessly try to change these internal experiences or free themselves from them. These efforts to control these damages is useless and on the contrary ensues to the deterioration of the feeling, emotions and thought that he/she tries to avoid from them (Hayes, Strosah, & Wilson, 1999). The six bases of ACT processes are as follows: 1. Acceptance; 2. Clear Cognition; 3. Self- Integrity; 4. Touching all Moments of Life; 5. Defining the Values and 6. Consistency. These processes which are actually regarded as mind cognition and behavioral changing are mingled to each other to create psychological flexibility (Flaxman, Blackledge, & Bond, 2004:37).

Life quality is a complicated structure more extensive and comprehensive than mental sanity. It is a complicated structure that covers various domains of life such as health condition, ability to practice the various activities of daily life affairs, undertaking the role of the job, gaining the opportunities to follow recreations and entertainments, practicing the social functions of friendly relations and establishing relation with others, ability to employ the sources to preserve sanity, keeping the standards of life and public sanity. (Pine et al., 1999, quoted from Asadi Radd, 2011). Sarvimaki, Stenbock, & Halt (2000) believe that according to Frankle philosophical discourses (1972), the aforementioned 3 domains are regarded as the main variances of life quality. Frankle believes that human being is believed to be a creature that looks for meaning of life and also the creator of the meaning. Welfare alludes to the aspect of life enjoyment and the sense of being valuable and useful; it means that man experience as an existence who values himself with regard to
his/her activities. The factors that affect on sense of welfare, the sense of being meaningful, and the sense of being worthy are called the conditions of the life quality and divided into two groups: internal and external conditions. From this view, sanity, is having the capacity of practicing the functions’ employing the mechanism of adaptability and looking for an independent character. These are the elements of the internal conditions and on the other hand environmental or external condition embraces: job, housing and the social network and the position of life in the society.

Psychologists maintain that aging is a phase of life which usually starts from 60 to 65 and in this phase some changes appear in the internal and external organs that make adaptability to environment difficult for mean. Ageing could be studied from four different perspectives: the passage of the years of life, the physical condition, the psycho-emotion and the social position (Brayan L. & Robert, 1984). Macular degeneration relating to age (the passage of the years of life) is the main factor of permanent blindness for the aged people. Its reason is not known yet, but the chance of occurrence will rise by the passage of any decade after 50. Other factors are race (Caucasian as usual) gender (for women the chance of being blind is a little more), the background of the family, and being addicted to cigarette. The disease covers an extensive range of clinical and pathological findings which fall into two groups: Non-oxidative (arid) and oxidative (wet). It is true that both types are deteriorating and bilateral but are different from the view of symptoms, syndromes and the method of therapy. The oxidative type is the cause of around 90 percent of all the popular blindness due to age-related macular detergence (Ashtar Nakhaee, 2008:75). The result of various studies emphasize on the ACT. For instance Irandoost and his colleagues (2005) in their notes titled “the role of group therapy, based on acceptance and commitment on the anxiety, relates to pain and depression of women who suffer from chronic backache” reached to this idea that group therapy based on ACT decreases psychosomatics of the people who are suffering from chronic backache that could improve their sanity. Anvari and his colleagues (2014) in their study showed the efficiency of newly method of therapy of the third wave of behavior. Velose and his colleagues (2008) in the process of their research placed 108 patients under the special therapy by employing two key processes namely therapy based upon: 1. Acceptance, and 2. Commitment, i.e. acceptance of pain and acting based on value. Three years after therapy, the practitioners studied the long term result of therapy. The result showed that the patients have improved both physically and emotionally. As it is said before the disease of ARMD causing blindness and semi blindness not only badly affects on the physical sanity but also affects on the psychological sanity too, that ensues lowering the man’s dignity and self -respecting and evinces the negative senses and since the goal of ACT is to promoting the life quality not adapting or adjusting the emotions, the result of various research showed that the acceptance of pain, decreases the pain and improve the life quality. On the other hand, up to now, no research has been done to study the efficiency of ACT on ARMD. The present study attempts to understand whether ACT could affect the life quality of the aged people suffering from ARMD?

Method

The research was done within a semi experimental study of the type of ANOVA with repeated measure and the LSD.

participants

The research population of the present research is the aged men and women of Karaj province who were suffering from ARMD in Noor-e-didegan, Nour-e-Didegan Ophtalmology Clinic, within a period from the winter of 2015 to the spring of 2016. In this research, 28 aged people who were examined by the ophthalmologist of
the clinic were diagnosed suffering from ARMD. The patients were selected through accessible sampling on the basis of their acceptation and refusing divided into two groups of 14 people in experimental and control groups and the questionnaires were given to them. It shall be noted that first, all participants were informed consent and necessary issues such as aims of the study, privacy, secrecy, etc., were fully discussed to them. Moreover, they were told that if anyone intended, she/he could refuse continuing in any session of the procedure. In addition, it was explained that after finalization of the study, participants would get informed about the results. Regarding to the study ethics, all the participants in control group received the full intervention package immediately after accomplishment of the study for free.

The criteria for choosing these patients were:
1. The men and women who were 60 or over; 2. Patients suffering from ARMD (both wet and dry); 3. Those who at least 5 years were suffering from ARMD. The criteria for putting aside the patients were as follows:
1. Those who were below 60; 2. Those who were suffering from demance (it should be noted that the patient’s consent have received in advance).

Measures

To collect data, two questionnaires were used, one for the life quality and the other for demography.

A. Life quality questionnaire: to measure the level of life quality, WHO (1996) was used which contains 25 questions that measure 4 dimension of life quality, these four domains are: physical sanity, psychological sanity, social relation, and social environment. This scale has been translated into 19 languages and is used in various countries to measure the life quality of people. For final evaluation of the scale of the questionnaire, the researcher piloted it through 302 students (both girls and boys) of Shiraz University and for ensuring the homogeneity, the Cronbach’s Alpha formula was used and the result was obtained .84 which is high and proper co-efficient level and the gained result, a proper simultaneous authenticity was observed (Nasiri, 2006).

B. The demographic questionnaire collect information about the age, education, gender, and matrimony of participants. To practice the research after choosing the typical questionnaires, they were placed simultaneously at the disposal of those who participated in the research. Participant after completing the questionnaires were placed randomly into two control and experimental groups. The experimental group in addition to receiving the medicine were given ACT therapy within 8 sessions, each session lasted 2 hours (once a week), but the control group did not receive any treatment. After the final phase, new questioners were distributed among both groups. In this research, the method of therapy was ACT and the practitioners tried instead of changing the content, form or the thoughts that put them in trouble, concentrated upon the functions of cognitions that make them distress. The goal of this method of therapy is to help the patients to gain a better, richer and more meaningful life, which could be achieved through more flexible psychology. The description of the sessions of interfering has been shown in table 1.

Data Analayzing

In this section the descriptive indicators of the research variants in the phases of pre-test and post-test and follow-up in both groups (experimental and control) are presented. In the domain of the sample of experimental group that covers the people of 64 to 91 years old; the average age of the experimental group was 82.97 and in the control group was 72.21. The frequency of sample distribution according to sex in the experimental group was 6 women and 8 men and
in the control group were 4 woman and 10 men. The frequency percentage of education of the participants was as follows: 17.9% were uneducated; 42.9% were under A-level; 10.7% were 0 level and 3.6% possessed the diploma of M.S. or M.A. The frequency percent of the participants from the view of matrimony was as follows: 71.4% were married and 28.6% were single.

**Result**

In table 2, the mean and deviation from standards of life quality fall into 3 phases i.e. pre and post test and follow-up the people of the both groups have been studied.

As the table 2 shows the mean score in the experimental group in the pre-test phase under the standard of physical sanity (60.43) and after the test are 66.29, and in the phase of follow-up is 64.93. Also the mean score of psychological marks in the experimental group in the pre-test phase is 58.07 in the post-test is 68.36 and in the phase of follow-up is 67.42. The mean score of social relations of the experimental group in the follow-up phase is 77. The mean score of environmental sanity of experimental group in the pre-test phase is 60.36, in the post-test is 64.43, and in the follow-up phase is 63.93. The diagram 2 shows the mean score of the fraction of the standards of life quality in the 3 phases of testing in both groups.

To test hypothesis of the present research, the repeating variance was used. Before testing the hypothesis and ANOVA with repeated measure, the assumptions were met to observe the pre-assumptions through Shapiro-Wilk test to assure of normality, the
Table 2. Mean and standard deviation of scores of QOL in experiment & control groups

<table>
<thead>
<tr>
<th>Variance</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Follow-up</th>
</tr>
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<tr>
<td></td>
<td>group</td>
<td>mean SD</td>
<td>mean SD</td>
</tr>
<tr>
<td>Physical sanity</td>
<td>test</td>
<td>14/66 × 60/43</td>
<td>13/05 × 66/29</td>
</tr>
<tr>
<td></td>
<td>control</td>
<td>12/31 × 58/14</td>
<td>10/94 × 57/29</td>
</tr>
<tr>
<td>Psychological sanity</td>
<td>test</td>
<td>18/04 × 58/07</td>
<td>10/96 × 55</td>
</tr>
<tr>
<td></td>
<td>control</td>
<td>10/09 × 56/29</td>
<td>2/1 × 56/43</td>
</tr>
<tr>
<td>Social relation</td>
<td>test</td>
<td>18/83 × 68/71</td>
<td>16/76 × 77</td>
</tr>
<tr>
<td></td>
<td>control</td>
<td>11/50 × 60/36</td>
<td>10/67 × 59/43</td>
</tr>
<tr>
<td>Sanity of environment</td>
<td>test</td>
<td>14/46 × 60/36</td>
<td>14/38 × 64/43</td>
</tr>
<tr>
<td></td>
<td>control</td>
<td>12/45 × 56/71</td>
<td>12/39 × 57/64</td>
</tr>
</tbody>
</table>

Diagram 2. Mean of scores of subscales of QOL in three levels in experiment and control groups
Levene’s Test was done to assure of consistency and integrity of the variances, and Mauchly’s Test of Sphericity was done to be sure of the homogeneity and integrity of co-variances.

The hypothesis of the research is:” The ACT therapy affect on the life quality of those who are suffering from ARMD.” In table 1, the results of the Levene’s Test and Shapiro-Wilk studies as well as the study of Mauchly’s Test of Sphericity have been presented.

As we have seen in table 1, the significant meaning of the level of Levene’s Test, Shapiro-Wilk for all the variances are over .05. Therefore the theory of integrity and homogeneity of variances and their normality are affirmed. The level of significant meaning of the Mauchly’s Test of Sphericity study about the physical sanity and psychological sanity as well as social relation are less than .05 and for the sanity of environment is over .05. Therefore one can say the homogeneity of co-variances in the three variances of physical sanity, psycho-sanity and social relations have not been considered but the environmental sanity has been considered. Due to the fact that Sphericity Assumed regarding the physical sanity, psycho-sanity and social relation have not been considered in the outcome of the ANOVA with repeated measure, the results of the study of Greenhouse-Geisser have been offered. In table 2, the result of the study of ANOVA with repeated measure has been presented.

As table 2 shows, between the agents’ scores (pre and post test and follow-up) in the level of physical sanity no meaningful differences were observed; but between the agent’s scores in the field of psycho-sanity, social relations and environmental sanity a meaningful difference (p≤0/01) was observed. In studying interaction between various phases of studies and the groups, the results showed that between the agent’s mark (pre and post test and follow-up) and the groups in the rate of physical sanity (p≤0/05), psycho-sanity and social relations at the level of (p≤0/01) a meaningful interaction was obtained. These results show the effect of ACT on all the three domains but no meaningful result was achieved for the sanity of environment. The rate of affecting or the difference (Partial Eta Squared) and the statistical power of any of the variances have been presented in statistical exponent of any of the variances. In table 2, variances have offered in tables 5 and 4. To show which variance in which

<table>
<thead>
<tr>
<th>Table 1. the result of Levene’s Test, Shapiro-Wilk and Mauchly’s Test of Sphericity for studying the assumptions</th>
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</thead>
<tbody>
<tr>
<td><strong>Variances</strong></td>
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<td>----------------</td>
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<tr>
<td><strong>Physical sanity</strong></td>
</tr>
<tr>
<td></td>
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<td></td>
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<tr>
<td></td>
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<tr>
<td><strong>Psycho sanity</strong></td>
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<tr>
<td></td>
</tr>
<tr>
<td><strong>Social relation</strong></td>
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<td></td>
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<td></td>
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<tr>
<td><strong>Sanity of environment</strong></td>
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phase of study possesses a meaningful difference the test of LSD with the provision of observing the homogeneity of variances have been used. This test has been done to compare the averages in twos or two by two. The results are shown in table 3.

According to the results of table 3, in the experimental group, between the mean scores of physical sanity, psycho sanity and social relations in comparing the phases of pre test and post test, there is a meaningful difference: (p≤.01) but between the phase of pre-test follow-up and post-test follow-up, no meaningful difference was seen. It means that the rate of physical sanity, psycho sanity, and social relation has increased significantly but such augmentation in the passage of time has not remained stable.

Discussion

The present research has studied the role and efficiency of experimental group through the ACT for the aged people suffering from ARMD. The findings have shown that employing such manner of approaching has improved the life quality of the people who are suffering from ARMD in three domains of physical sanity, psycho sanity and social

Table 2. Results of one-way ANOVA with repeated measures to assess the between-group and interactional effects.

<table>
<thead>
<tr>
<th>between-group effect</th>
<th>SS</th>
<th>df</th>
<th>Ms</th>
<th>F</th>
<th>P</th>
<th>Partial Eta Squared</th>
<th>statistical power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Sanity</td>
<td>236/09</td>
<td>1/17</td>
<td>201/69</td>
<td>2/59</td>
<td>0/113</td>
<td>0/09</td>
<td>0/50</td>
</tr>
<tr>
<td>Physical Sanity of Group</td>
<td>518</td>
<td>1/17</td>
<td>442/52</td>
<td>5/7</td>
<td>0/02</td>
<td>0/18</td>
<td>0/68</td>
</tr>
<tr>
<td>Psychological Sanity</td>
<td>343/02</td>
<td>1/54</td>
<td>222/15</td>
<td>9/62</td>
<td>0/001</td>
<td>0/27</td>
<td>0/94</td>
</tr>
<tr>
<td>Psychological Sanity of Group</td>
<td>114/064</td>
<td>1/54</td>
<td>738/72</td>
<td>31/99</td>
<td>0/001</td>
<td>0/55</td>
<td>1</td>
</tr>
<tr>
<td>Social Relation</td>
<td>252/59</td>
<td>1/27</td>
<td>199/14</td>
<td>4/67</td>
<td>0/03</td>
<td>0/15</td>
<td>0/62</td>
</tr>
<tr>
<td>Social Relation of Group</td>
<td>891/5</td>
<td>1/27</td>
<td>312/37</td>
<td>7/32</td>
<td>0/007</td>
<td>0/22</td>
<td>0/81</td>
</tr>
<tr>
<td>Environmental Sanity</td>
<td>89/43</td>
<td>2</td>
<td>44/71</td>
<td>4/07</td>
<td>0/02</td>
<td>0/74</td>
<td>0/69</td>
</tr>
<tr>
<td>Environmental Sanity of Group</td>
<td>179/02</td>
<td>2</td>
<td>31/05</td>
<td>2/82</td>
<td>0/07</td>
<td>0/10</td>
<td>0/53</td>
</tr>
</tbody>
</table>

Table 3. Results of repeated measures test for subscales of quality of life in diad comparision of intervention phase in experiment group

<table>
<thead>
<tr>
<th>Phases</th>
<th>Pretest-Posttest</th>
<th>Pretest-follow-up</th>
<th>Posttest-follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variance</td>
<td>variance</td>
<td>sig</td>
<td>variance</td>
</tr>
<tr>
<td>Physical Sanity</td>
<td>-2/5</td>
<td>0/004</td>
<td>1/75</td>
</tr>
<tr>
<td>Psychological Sanity</td>
<td>-4/5</td>
<td>0/0001</td>
<td>-0/46</td>
</tr>
<tr>
<td>Sanity of Environment</td>
<td>-3/68</td>
<td>0/004</td>
<td>-3/68</td>
</tr>
</tbody>
</table>
relation significantly. Because unlike the physical therapies which keeps the patient in the hospital or treating by medicine which costs too much, the patients who were undergone, the approach of ACT could follow the practices and techniques that they have trained in their homes and also extended this methods in other cases. It could be said that one of the factors that threat the life quality is sudden changes in the life of aged one; like inflicting to a serious diseases. Regarding the fact that the main goal of life quality is sanity and therapy of the chronic diseases and promoting the psycho sanity; therefore the aged people due to the agedness and psycho disability, evaluate themselves negatively and such a view, discourage and disrespect them.

The present treatment with regard to emphasizing the values of people and setting goal and acting committed homogenous with their values and also acceptance of pain due to deficiencies special for agedness and, AMRD raises the mark of life quality. The goal of therapy based on commitment and acceptance is decreasing experimental avoidance and increasing psychological flexibility through accepting inevitable ominous and harmful feelings and encouraging aged people to practice and training and turning their attention towards their values and the goals related to the values and committed act.

Therapy is a practical – situational approach based upon the theory of relating system that regards man’s’ pain due to the psychological inflexibility that originates from distortion of cognition and experimental avoidance. In the context of therapy relations, the therapy based on ACT and direct approach and indirect verbal processes in order to create psychological flexibility to encourage the patient to accept the pain and to create an exalted feeling toward himself or herself at the time of being, and creating values and patterns of act committed in relation to these values (Montazeri and his colleagues 2012) in this approach the values are defined as a selected quality of directed activities and teach the aged people to distinguish between choices and reasonable judgments and encourage them to choose the values and consider what they dream in various domains of their life such as job, intimate relations, friendship, personal growth, sanity and spirituality and these factors are regarded as the agents of life quality that improve the patients’ quality of life. In the ACT approach, the patients are asked to turn their attention to the various dimensions that they regard important such as job, family, intimate relations, friendly relations, personal growth, and spiritual sanity and so on. Emphasizing upon the values of the patients encourage them to participate in the sessions of group therapy. In the therapy sessions, some the dimensions of life quality are regarded as values; the dimensions such as physical activity, the limitation of role performing due to physical condition, limitation or role performing due to the emotional difficulties and accepting these limitations and avoiding from denial them help the aged people to improve their condition. The processes of accepting the statuesque, considering the values and acting committed helps the aged people to accept the responsibility of changing their behavior. Therefore an equilibrium will be established between the changeable domains through concentrating on them (visible behaviors) and the strategies of unchangeable domain through the processes of acceptance and awareness of mind (Heyse et al., 2004). The considerable point is that the participants by practicing the exercises and by seeing their effects found a stronger feeling to control their disease (Ibide). In this research no change was seen in the degree of environmental sanity. This domain covers financial issues, freedom, new skills, participating in entertainments and procreative activities. Since these issues are regarded as external obstacles for the aged people which are not to be eliminated easily and to move towards the goals despite the existence of these obstacles needs a great effort and it is clear that due to the limitations of time and practices one cannot expect and upheaval in this field.

Up to the present time no research has been done
to study the effect of this type of therapy (ACT) on the patients suffering from ARMD. With regard to the effect of this therapy upon the rise of life quality among these patients, it could be said that the results of the present research are in line with the results of Fernandez et al. (2015), Dindo et al. (2012), Bahar Mohebbat et al. (2014), Narimani et al. (2014), Nasiri et al. (2016), Bakhshayesh et al. (2015), Fathi Ahmadi Sarabi et al. (2016).

Fernandez et al. (2015) showed that the approach of ACT along with training in the SOC strategies could help the aged people suffering from ARMD improve their ability to act independently.

Dindo et al. (2012) in the process of their studies invited 45 patients suffering from migraine and depression in a one workshop of ACT. The result showed that the scores of three domains have increased significantly.

Mohabbat Bahar and et al. (2014), in a research concluded on the efficiency of Group Psycho Therapy of ACT on the Life Quality of the Women Suffering from Breast Cancer, found that this therapy is effective in the field of physical sanity, psycho sanity and social relations and promotes their life quality.

Narimani et al. (2014), have studied the efficiency of ACT on the life quality of the sterile women and concluded that this therapy has improved their life quality and has affected upon the indicators of general sanity, physical role, social activities, physical pains, psycho-sanity and liveliness.

Nasiri et al. (2016), followed the research of efficiency of ACT on the life quality of those who were suffering from disorder of digestive system and the efficiency of this therapy was approved.

Fathi Ahmadi Sarabi and et al. (2016), followed the same method of therapy on the life quality of the diabetic 2nd type patient. Their findings showed the efficiency of the therapy that after 3 month of therapy, the life quality was checked again and it showed the stability of the efficiency of the therapy. As Fathi said: “limitations of expert research in this field, illiteracy of some of the members have been invited as samples, the probable misunderstanding the content of the questionnaires which may affect the result of the research; unsuitable place for training and practicing therapy, difficulties to keep the consistency of the patients and gaining the necessary budget to follow the research’s expenses at least for one year; were among the obstacles that faced the research with great difficulty. Since the present research was done in a clinic in Karaj it is difficult to generalize the result in the other regions.

The suggestions for realization the goals of the present research are: sampling should be done randomly and since the research was done in a restricted place, namely Karaj Noor-e-didgan clinic, the result may be regarded with a certain doubts, while if it was possible to follow the research in a greater and more credible clinic so far the results of the research could be generalized. To remove the problems for transferring the methods of ACT effectively to the illiterate and semi literate people, it is possible to employ other manners besides the questionnaire, for example they could be interviewed.

Appreciation
I could not finish the report of my research without saying that I am heartedly indebted to all the participants of the project especially my noble professors and the head of Karaj Noor-e-didgan Clinic.

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