ISSN: 2165-9370 Volume 6, Number 3, July 2017

Scientific Research Publishing

Open Journal of Medical Psychology

ISSN: 2165-9370

9 772165 937002 03

www.scirp.org/journal/ojmp

Journal Editorial Board

ISSN Print: 2165-9370 ISSN Online: 2165-9389

http://www.scirp.org/journal/ojmp

Editorial Board

Scientific Research Publishing

Open Journal of Medical Psychology, 2017, 6, 179-212
http://www.scirp.org/journal/ojmp
ISSN Online: 2165-9389
ISSN Print: 2165-9370

Table of Contents

Volume 6 Number 3 July 2017

Open Journal of Medical Psychology (OJMP)
Journal Information

SUBSCRIPTIONS

The *Open Journal of Medical Psychology* (Online at Scientific Research Publishing, www.SciRP.org) is published quarterly by Scientific Research Publishing, Inc., USA.

Subscription rates:
Print: $59 per issue.
To subscribe, please contact Journals Subscriptions Department, E-mail: sub@scirp.org

SERVICES

Advertisements
Advertisement Sales Department, E-mail: service@scirp.org

Reprints (minimum quantity 100 copies)
Reprints Co-ordinator, Scientific Research Publishing, Inc., USA.
E-mail: sub@scirp.org

COPYRIGHT

PRODUCTION INFORMATION

For manuscripts that have been accepted for publication, please contact:
E-mail: ojmp@scirp.org

Scientific Research Publishing

Open Journal of Medical Psychology, 2017, 6, 179-196
http://www.scirp.org/journal/ojmp
ISSN Online: 2165-9389
ISSN Print: 2165-9370

Attitudes to Group Assessments: Prospective Psychotherapists' Experiences of Being Assessed by Fellow Students

Anette Jervelycke[1], Billy Larsson[1], Torsten Norlander[1,2*]

[1]Center for Research and Development, Evidens University College, Göteborg, Sweden
[2]Department of Clinical Neuroscience, Karolinska Institute, Solna, Sweden
Email: *at.norlander@mailbox.swipnet.se, *torsten.norlander@ki.se

How to cite this paper: Jervelycke, A., Larsson, B. and Norlander, T. (2017) Attitudes to Group Assessments: Prospective Psychotherapists' Experiences of Being Assessed by Fellow Students. *Open Journal of Medical Psychology*, **6**, 179-196.
https://doi.org/10.4236/ojmp.2017.63015

Received: April 3, 2017
Accepted: June 6, 2017
Published: June 9, 2017

Abstract

Background: The guidance of prospective therapists focused on Cognitive Behavioral Therapy (CBT) is most often made by groups of four students. However, learning therapist skills is a sensitive process that will be affected by the processes which occur within the group. **Objective:** The aim was to examine prospective psychotherapists' attitudes to group assessments based on the revised version of the Cognitive Therapy Scale (CTS-R). **Method:** Participants were 56 students with an average age of 45.65 years (*range* = 31 - 64). They were recruited from psychotherapy training at the Gothenburg University and the Evidens University College in Sweden. A questionnaire was constructed in which the questions were answered by check on visual analogue scales (VAS). **Results:** A majority of students consisting of 38 participants (68%) had a very positive approach to group assessments, while a minority of 18 participants (32%) was more negative. Most crucial for how to answer the question of group assessments was whether they considered themselves as fairly evaluated by their student colleagues within the group and whether or not only the supervisor should make the assessments. The view of group assessments (negative or positive) was not related to age, gender, and level of education in CBT or profession. In addition, both groups had a very positive view of both the CTS-R and the supervisors. **Conclusion:** It was concluded that more studies with the same focus are needed to determine the extent to which the results are generalizable.

Keywords

CBT Competences, CTS-R, Evaluation Process, Group Assessments, Prospective Psychotherapists

1. Introduction

The World Health Organization has estimated that about 450 million people worldwide suffer from mental illness and that most of the mentally ill do not get the help and treatment they need [1]. In the West, an estimated 50 percent of those in need have no access to necessary assistance and in developing countries, the figure is 80 percent. Even in a welfare state such as Sweden, public health is a matter of concern due to the increase of mental diagnoses [2]. Stress, anxiety and depression are all substantially increasing and those accounted for the highest number of mental illness are people working in the field of health care, but sick leave is substantially increasing within almost all occupations. In addition, mental diagnoses are also increasing within vulnerable groups such as young women (anxiety and depression), young men (neuropsychiatric diagnoses) and migrants (anxiety, depression and post-traumatic stress).

Against this background, it becomes obvious that our societies are facing growing challenges and due to the fact that CBT treatments have strong research support and have been proven cost-effective [3], the demand for these treatments increases [4]. The growing complexity of the mental illness in combination with a growing numbers of new treatment models in CBT [5] [6] now sets a stronger demand also on therapists and trainers. There is now a need for therapists with a deep knowledge in general CBT skills, who also have a good overview on new methods and models. Training therapists is a complicated matter. Besides, being both time and resource intensive for students as well as for educators, the scientific evidence for this task is very limited [7]. The extensive research concerning treatments has not yet provided sufficient evidence and guidelines concerning therapist training [4]. Further there is even less scientific evidence for how these skills and abilities should be operationalized, learned, evaluated and assessed [8] [9] [10] [11]. Bandura [12] argued that psychotherapy is a learning process and, therefore, greater effort should be made to develop treatment methods derived from knowledge of learning and motivation. A central component in Bandura's social learning theory [13] illustrates the importance of observing and modeling behaviors and a recent study [14], where 2607 US and Canadian psychotherapists participated, indicates that they largely learned from supervisors and colleagues as it seemed imitated their behavior.

Although the therapist profession requires extensive theoretical knowledge, the work is largely practical. An important part of the training is therefore to stress that theoretical knowledge must be put into practice, so that students acquire the skills and abilities needed to assess an individual patient's needs and to select and implement appropriate treatments [4] [10] [15] [16]. Education and training in those moments occur mainly in the tutorial course, where the prospective therapists carry out treatments under the guidance of trained CBT supervisors. According to an extensive survey [4], research on guiding and supervision of prospective CBT therapists is scarce in literature. However, psychotherapy research has gathered a lot of knowledge about "what works" and "what needs to be done" in treatment [17] [18]. This knowledge has been systematized

in manuals and gradually has also instruments assessing fidelity to the manuals been constructed. A continuous effort to systematize and describe the competence, therapists needs for carrying out different treatments has been made over the years. One of the more ambitious attempts in this endeavor has been made under the IAPT project (Improving Access to Psychological Therapies) of scientists and clinicians in the United Kingdom [19]. In this project general therapist competence, CBT specific competence, and diagnosis specific competence have been defined and described. Further research has also examined the relationship between therapists' behaviors and treatment outcomes [9] [20] [21], but it has not yet been possible to draw any clear conclusions from those studies.

How therapeutic skills should be taught is a question that has interested several clinicians and researchers. Padesky [22] as well as Liese and Beck [23] used therapy models as a base for supervision, which is now a common practice in-educational supervision [10]. Bennett-Levy [24] has also made an ambitious attempt to define and describe the knowledge systems used for learning. His model assumes that the learning skills of the therapist are enhanced by declarative as well as procedural and reflexive processes. Declarative processes include conceptual knowledge such as theory and technology and also knowledge of interpersonal functioning, while procedural processes concern interpersonal and technical skills, frameworks, attitudes, as well as rules, plans and procedures. Reflexive processes concern the ability to relate in a curious and reflective way to oneself and to the environment. Bennett-Levy and associates [8] have also evaluated which methods and tools that are most effective for each learning process. This knowledge may now help to strengthen and streamline the learning process in terms of therapist skills, but it should be noted that so far only a few studies examine strategies leading to increased competence [25]. Other and more general models used in supervision are concerned with the role of experience [26] or interactions between learning and development [27]. For the time being there is no generally accepted learning model available [25] [28], nor any generally accepted models for feedback and assessment of achieved skills [7] [11] [29] [30]. However, it is considered important that tutoring sessions are well prepared and have an agenda [31].

A common practice at several educational institutions is the use of rating scales for feedback and for assessing student therapist skills. There are currently a number of tried and tested assessment tools available. One of the earliest developed assessment tools was the Cognitive Therapy Scale (CTS) developed by Beck and Young [32]. The scale measures adherence and competence and have been widely used in psychotherapy research and is considered to have acceptable psychometric properties [33]. A number of other scales reminiscent of the CTS have been developed, as Safran's Therapy Adherence Scale (STAS) [34], Cognitive Therapy Adherence and Competence Scale (CTACS) [35], Assessment of Core CBT Skills (ACCS) [36], Supervisor Rating Form (SRF) [37], the Collaborative Case Conceptualization Rating Scale (CCCRS) [38], and the UCL scale of Structured Observation (USO) [39].

The above mentioned scales are often extensive and thus time-consuming for both students and supervisors to learn and to administer which is somewhat of an obstacle when time and resources for guidance are limited. An attempt to improve the efficiency of the original CTS-scale has been made by Blackburn and others, resulting in the CTS-R, Cognitive Therapy Scale, revised version [40]. In the revised version overlapping material from the original CTS has been reduced and furthermore the Dreyfuss learning model [41] was incorporated. This model suggests that adult learning develops in phases. Achieved knowledge is defined by six categories: 1) incompetent, 2) novice, 3) advanced beginner, (d) competent, 4) proficient and 5) expert. CTS-R consists of a total of twelve items tapping different CBT skills. The rating scales run0-6 where adherence and competence are weighed in together. CTS-R has been widely used in research concerning supervising. The scale is considered to have a certain bias toward cognitive dimensions, but the benefits are that it is less time consuming to learn and easier to administer, which enables repeated assessments. In addition, the manual includes [40] detailed descriptions of the scale points for each question and there is also an associated "good-practice guide" with concrete examples. CTS-R is now thoroughly explored in terms of validity and reliability. It is also translated and evaluated in Sweden [42].

The most common model for tutoring is that students are supervised in groups of four [4]. According to Kuechler [43] there are many benefits from group tutoring for both supervisors and participants. The benefit for participants may be that a safe base is created with access to mentoring which facilitates reflection and development of a professional identity. Further, group supervision provide good conditions for teaching and learning because students can follow not only their own therapies but also those performed by the colleagues and feedback is given from both colleagues and supervisors [10] [44] [45]. Learning of therapist skills is a sensitive process that can be disturbed if the groups do not work well enough. Group processes consist of factors that are unique to the group environment, which leads to changes in the group and thus affect the group's functioning [43] [44]. It may for example include individual events, the participants' personal style, difficulties in therapy sessions, interactions between participants and the alliance between supervisors and participants. Examples of problematic behaviors of individual team members that may affect the group negatively are participants who constantly take up too much space, are constantly critical or silent, seems bored or find it difficult to accept help. There are also supervisor behaviors that are considered to contribute to the negative group processes [25]. Supervisor styles that are too lenient or too authoritarian are described by students as sources of dissatisfaction. In order to create good conditions for learning, the supervisor must establish and maintain a good alliance and observe, assess, support and give constructive feedback. The existence of a good alliance between supervisor and students is described as one of the most important factors that secure cooperation in the group. Students also highlight the importance a goal-oriented behavior from the supervisor as well as a non-

judgmental approach towards participants [25]. However, it was not possible to find previous performed studies that analyzed the underlying factors for prospective psychotherapists' attitudes to group assessments based on the CTS-R.

Most institutions that trains psychotherapists in CBT uses some form of rating scale of the type already discussed above as a basis for learning and evaluation [42]. The rating scale is introduced early in the training and the aim is that the students should have a scientifically evaluated instrument as the basis for the learning process. Using the rating scale, different therapist skills can be described, practiced, evaluated, and assessed during on-going tutoring. Students are continually assessed and receive frequent feedback from both supervisor and colleague students. As previously noted, occasionally difficulties occur. Sometimes the learning process is hampered when a group develops a destructive way to provide feedback or by participants who become overly cautious or idealizing in their feedbacks. Typically, these situations can be used to strengthen the process and bring about constructive, investigative and reflective discussions. Parallels may also be drawn to difficulties experienced in the treatment process. The aim of the current study was to examine prospective psychotherapists' attitudes to group assessments based on the revised version of the Cognitive Therapy Scale (CTS-R).

2. Methods

2.1. Participants

Participants were 56 prospective therapists specializing in CBT (7 men, 48 women, and one without data) with an average age of 45.65 years (*SD* = 7.78, *range* = 31 to 64). Of the participants 19 individuals attended the basic training in CBT, and 36 individuals attended the psychotherapist program of CBT. The study took place in 2016 and the students were recruited from two educational institutions in Gothenburg, Sweden. The basic training was an undergraduate course of three semesters focused on basic CBT-knowledge in theory and practice, while the psychotherapist program consisted of six semesters which gave full jurisdiction as a licensed therapist. The participants were either in ongoing programs or had just received their diplomas. The basic professional affiliations of the participants allocated as follows: psychologists (15 persons), social workers (17 persons), and other health care staff (24 persons). In light of the purpose of the study, participants were divided in two groups after a specific procedure (see section Data Processing) based on whether or not they perceived it as a good idea to be assessed by their fellow students in the tutoring group. There were 18 participants who experienced this as less good (Negative) and 38 as very good (Positive). Analysis (*Chi-Square*, 5% level) showed no significant relations ($ps > 0.05$) between attitudes to group assessment (negative or positive) in terms of gender, level of education in CBT or profession. An Independent Samples t-test (5% level) showed no age difference regarding attitudes to group assessment ($p > 0.05$).

2.2. Instruments

Questions about the CTS-R and group assessments. A questionnaire was constructed to investigate students' attitudes to the CTS-R and group assessments. The 36 questions were answered by check marks on Visual Analogue Scales, each with a length of one decimeter (about four inches) which envisioned the scale from 0 to 100. As "anchor points" clearly articulated response alternatives were used such as "*not at all-in the highest degree*" and "*significantly reduced-significantly increased*" The questions are presented in Table 1.

Table 1. The 36 items in the survey "Questions about the CTS-R and group assessments".

1. To what extent are you familiar with the scale?
2. To what extent do you think the scale is relevant for describing the practical skills of therapists?
3. To what extent do you think the scale is relevant for assessing the practical skills of therapists?
4. To what extent have you experienced the assessment sessions as helpful for your learning process?
5. To what extent has your self-esteem/self-confidence been affected by the evaluations in the group?
6. To what extent has your own learning been affected by estimating your colleagues therapist skills in the group?
7. To what extent has your learning been affected by getting your colleagues' views/evaluations?
8. To what extent has your self-esteem/self-confidence been affected by getting your colleagues' views/evaluations?
9. To what extent has your learning been affected by getting your supervisor's views/evaluations?
10. To what extent has your self-esteem/self-confidence been affected by getting your supervisors' views/evaluations?
11. To what extent has the group participants' learning been affected by group assessments of therapist skills?
12. To what extent has the social climate of the group been affected by group assessments?
13. To what extent have you during assessment sessions been honest when evaluating yourself?
14. If you have not been completely honest, have you under- or overestimated yourself?
15. To what extent have you during assessment sessions been honest when evaluating your colleagues?
16. If you have not been completely honest, have you under- or overestimated your colleagues?
17. To what extent do you think that your colleagues have been honest in their evaluations of you?
18. If you think they have not been completely honest, have they then under- or overestimated you?
19. To what extent do you think that your supervisor has been honest in his/her evaluation of you?
20. If you think that your supervisor has not been completely honest, has he/she then under- or overestimated you?
21. To what extent do you think that you have been fairly assessed by your colleagues?
22. If you do not feel you have been fairly assessed, to what extent do you think the climate in the group affected the evaluation?
23. To what extent do you think that you have been fairly evaluated by your supervisor?
24. To what extent have you been able to express your own views to your colleagues if you perceived yourself as unfairly evaluated?
25. To what extent have your colleagues listen to your comments when you perceived yourself as unfairly assessed?
26. To what extent were you able to express your own views to your supervisor if you perceived yourself as unfairly assessed?
27. To what extent have your supervisor listen to your comments when you perceived yourself as unfairly assessed?
28. What benefits do you think you have had from the CTS-R scale regarding your own learning process?
29. What benefits have you had from your colleagues' opinions and evaluations regarding your own learning process?
30. What benefit have you had from your supervisors' opinions and evaluations regarding your own learning process?
31. How satisfied are you with the education as a whole?
32. To what extent do you think the CTS-R is a valuable tool for learning therapist skills?
33. To what extent do you think the CTS-R is a valuable tool for evaluating therapist skills?
34. To what extent is your view on the CTS-R scale influenced by how you perceive your supervisor?
35. To what extent do you think it is a good idea with group assessments?
36. To what extent had it been better to be individually assessed only by the supervisor?

There were three questions about the perception of the CTS-R as a rating scale to describe and assess therapist skills. These questions concerned the extent to which the students were familiar with the CTS-scale and whether they considered it appropriate to describe and assess therapist skills. Further questions were asked about the usefulness of the CTS-R for the students own learning processes, and how they valued the CTS-R as an instrument. Other questions aimed to investigate the students' experiences and attitudes to group assessments. These questions concerned the extent to which they perceived group evaluations as helpful for their own learning process, and whether or not their own learning and self-esteem were affected by the assessments, as well if they felt that the group participants learning was affected. The study's main question (*To what extent do you think it is a good idea with group assessments*?) was embedded as the penultimate item in the survey, followed by a control question as to whether they thought it was better to be individually assessed with only the supervisor. Thereafter an open question followed that gave students the opportunity to comment on their answers. The homogeneity of the instrument was tested by Cronbach's Alpha which gave a high value (*alpha* = 0.92).

Background data. The distributed questionnaire also included demographic data on level of education in CBT, profession, gender, and age.

2.3. Procedure

In order to recruit participants for the study two institutions which train therapists in CBT was approached, namely the Department of Psychology at Gothenburg University and the Evidens University College. These accepted participation and provided addresses to students. The questionnaire, a cover letter, as well as an addressed and stamped envelope for returning were sent to a total of 100 students who attended undergraduate courses in CBT or the therapist program. The cover letter described the study's purpose and scope, and also gave the information that participation was voluntary and anonymous. The questionnaire was thus answered anonymous and responses were sent directly to one of the authors. Of the 100 sent out questionnaires 56 responses were obtained.

2.4. Data Processing

Descriptive analysis of the distribution of participants' responses to the question "*To what extents do you think it is a good idea with group assessments*?" (M = 67.09, SD = 28.00) indicated a natural division (*cut point* = 64), where participants could be identified who had a very positive view of group assessments (Positive) including a high mean value and a low standard deviation (n = 38, M = 83.29, SD = 9.66) compared to participants (Negative) who experienced assessments from fellow students as less good (n = 18, M = 32.88, SD = 22.55). This categorization was to form the independent variable in comparisons (Attitudes to group assessment), while the original not categorized item was used in correlation and regression analyzes.

2.5. Ethical Considerations

This study followed the ethical standards of the World Medical Association declaration of Helsinki concerning Ethical Principles of Medical Research Involving Human Subjects. The data were collected by a psychologist (first author) as a preparation for a thesis in order to become a qualified specialist in clinical psychology. In addition the questionnaire was answered anonymous and responses were sent directly to the first author. Given these conditions, in accordance with the Swedish rules on ethics, the material contained in the report can be used to compile an article.

3. Results

3.1. Comparisons between Groups

Attitudes to group assessment. Statistical testing (Levene's Test of Equality of Error variances, 5% level) showed that conditions for multivariate analysis of variance did not exist in comparisons between the independent variable groups for about half of the included items why it was decided to instead use Independent Samples *t*-tests with correction for inconsistency (equal variances not assumed). Independent variable was the categorized variable *Attitudes to group assessment* (negative, positive) and dependent variables were the visual analog scales with the exception of item 35 which was the basis for the independent variable. The statistical analyzes yielded significant effects (*ps* < 0.05) for items with the following numbers: 4, 5, 6, 7, 8, 11, 12, 21, 22, 24, 28, 29, 32, 33, and 36. For means, standard deviations and statistical coefficients at the significant comparisons see Table 2.

Gender. Statistical analysis (Mann-Whitney U-test, 5% level) with all 36 items as dependent variables showed significant differences in regard to Gender for only four items: item 14 [$z = -2.22$, $p = 0.025$; Men ($M = 47.86$, $SD = 12.42$), Women ($M = 35.69$, $SD = 9.78$)], item 17 [$z = -2.01$, $p = 0.043$; Men ($M = 78.29$, $SD = 18.16$), Women ($M = 65.75$, $SD = 17.96$)], item 18 [$z = -3.40$, $p < 0.001$; Men ($M = 46.57$, $SD = 9.03$), Women ($M = 64.02$, $SD = 11.50$)], and item 34 [$z = -2.06$, $p = 0.037$; Men ($M = 70.86$, $SD = 16.81$), Women ($M = 44.55$, $SD = 31.39$)].

Level of education in CBT. Further analysis using the Mann-Whitney U test (5 % level) with all 36 questions as dependent variables and the two levels of education as independent variable showed no significant differences in terms of educational attainment (*ps* > 0.05).

Profession. Statistical analysis (Kruskal-Wallis, 5% level) with all 36 questions as dependent variables and the tree categories of profession as independent variable revealed significant effects concerning items 1, 9, 10, 24, 30, and 31 (*ps* < 0.05). Multiple comparisons according to Kruskal-Wallis indicated that the psychologists had responded with significantly lower scores on the six items as compared to the other two occupational groups, while the social workers gave significantly the highest score on four of the scales (1, 10, 30, 31) and persons belonging to the category "other health care staff" gave significantly the highest

Table 2. Means (*M*) and standard deviations (*SD*) for items in the survey in regard to attitudes to group assessment (Negative, Positive), coefficients for significant results (*t*, *df*, *p*), and all participants (All).

	Negative		Positive		Coefficients			All	
	M	*SD*	*M*	*SD*	*t*	*df*	*p*	*M*	*SD*
Item 1	72.50	19.87	71.92	14.37			>0.05	72.11	16.16
Item 2	69.67	15.33	73.42	13.17			>0.05	72.21	13.87
Item 3	67.33	17.19	73.89	13.79			>0.05	71.79	15.13
Item 4*	56.94	24.92	76.61	15.47	−3.62	54	0.005	70.29	20.95
Item 5*	48.65	14.40	66.29	16.64	−3.78	53	0.001	60.84	17.86
Item 6*	55.00	14.19	74.47	12.08	−5.23	53	0.001	68.45	15.56
Item 7*	52.47	12.03	76.00	12.80	−6.42	53	0.001	78.73	16.60
Item 8*	49.82	14.23	67.61	16.35	−3.87	53	0.001	62.11	17.66
Item 9	73.67	20.76	83.11	13.76			>0.05	80.07	16.75
Item 10	64.94	24.23	72.87	18.37			>0.05	70.32	20.55
Item 11*	56.00	16.60	76.00	11.43	−5.19	53	0.001	69.82	16.07
Item 12*	45.47	23.96	62.32	17.64	−2.92	53	0.016	57.11	21.09
Item 13	76.72	19.80	76.32	17.79			>0.05	76.45	18.28
Item 14	40.86	13.81	36.09	9.40			>0.05	37.54	10.99
Item 15	68.71	24.13	76.42	13.82			>0.05	74.04	17.79
Item 16	62.71	12.52	64.89	11.78			>0.05	64.28	11.90
Item 17	60.24	21.72	71.24	15.97			>0.05	67.84	18.47
Item 18	57.69	14.76	63.43	11.35			>0.05	61.63	12.66
Item 19	82.78	18.39	86.82	13.77			>0.05	85.52	15.36
Item 20	56.30	10.63	53.24	12.17			>0.05	54.03	11.73
Item 21*	63.53	22.77	83.71	8.77	−4.77	53	0.002	77.47	17.17
Item 22*	71.00	13.32	52.18	26.05	2.30	37	0.006	57.49	24.55
Item 23	78.17	24.35	85.47	12.84			>0.05	83.13	17.50
Item 24*	46.09	28.01	74.63	19.37	−3.75	41	0.008	67.33	24.95
Item 25	60.89	21.29	77.00	12.89			>0.05	73.38	16.35
Item 26	71.42	18.13	75.41	22.86			>0.05	74.32	21.54
Item 27	69.83	21.51	75.23	17.47			>0.05	73.72	18.58
Item 28*	57.44	24.97	80.71	11.70	−4.78	54	0.001	73.23	20.12
Item 29*	44.00	21.35	78.53	11.95	−7.68	53	0.001	67.85	22.19
Item 30	71.67	29.61	86.53	16.56			>0.05	81.75	22.46
Item 31	77.72	25.59	87.22	8.40			>0.05	84.11	16.53
Item 32*	63.61	24.36	82.68	10.13	−4.16	54	0.005	76.55	18.26
Item 33*	60.61	23.64	80.16	10.55	−4.30	54	0.003	73.88	18.23
Item 34	38.67	33.95	53.46	28.99			>0.05	48.62	31.18
(Item 35)	(32.88)	(22.55)	(83.29)	(9.66)	-	-	-	(67.09)	(28.00)
Item 36*	73.44	27.31	35.26	25.77	5.08	54	0.001	47.54	31.64

Note: Item marked with * indicate significant difference in respect to Group (negative, positive). *Note*: Item 35 is the basis for the independent variable and is therefore not included in the group comparison.

score on two of the scales (9, 24).

Age. Participants were divided into three age groups (Visual Binning: *width* = 33.33, *cut points* = 42 and 50), Younger (n = 21, M = 38.10, SD = 3.55), Middle (n = 16, M = 45.06, SD = 2.05) and Older (n = 18, M = 55.00, SD = 3.24). Analysis (Kruskal-Wallis, 5% level) with all 36 items as dependent variables and age group as the independent variable showed no significant effects ($ps > 0.05$).

3.2. Measures of Relations

Correlations. The 36 items were correlated (Pearson's r, 5% level) with Item 35 (*To what extents do you think it is a good idea with group assessments*?) which is reported in Table 3.

Regression Analysis. In order to examine whether different aspects tapped in the visual analogue scales of the survey, affect the variance of the study's main question, a step-wise linear regression analysis was conducted. Item 35 (*To what extent do you think it is a good idea with group assessments*) was used as the criterion variable and all the other items were used as predictor variables. The analysis generated five models as follows: item 21 (Step 1: $Adj\ R^2 = 0.64$, $p < 0.001$); items 21 and 36 (Step 2: $Adj\ R^2 = 0.80$, $p < 0.001$); items 21, 36 and 1 (Step 3: $Adj\ R^2 = 0.86$, $p < 0.001$); items 21, 36, 1 and 12 (Step 4: $Adj\ R^2 = 0.88$, $p < 0.001$); and finally items 21, 36, 1, 12 and 17 (Step 5: $Adj\ R^2 = 0.90$, $p < 0.001$). The results showed that item 21 (*To what extent do you think that you have been fairly assessed by your colleagues*?) alone accounted for a full 64% of the variance in the first step. The second step included not only item 21 but also item 36 (*To what extent had it been better to be individually assessed only by the supervisor*?), which increased the impact with 16% to 80%. The subsequent steps indicated that the five visual analogue scales together could explain 90% of the variance of the criterion variable.

3.3. Comments on the Open Question

The questionnaire also included an open question where the students were able to justify their positions on how they had responded. Of the participants 38 individuals had commented on their answers where 22 persons (58%) preferred group assessments and 16 (42%) preferred individual assessment with only the supervisor. The students who were in favor of group assessments described the advantage of getting a more extensive feedback and not only from the supervisor. They also considered it instructive to share each other's strengths and potential mistakes. Further it included feeling less vulnerable to the supervisor. The students who preferred individual assessments highlighted that they felt uncomfortable when evaluated by fellow students. They believed that some colleagues were uneven in their knowledge of the CTS-R and even more common that assessments were influenced by relationships between team members. They also felt that the supervisor in these respects was more knowledgeable and objective. Finally, it was argued that individual evaluation could generate a freer and more in-depth assessment, which was considered to benefit the learning process.

Table 3. Correlations (Pearson's *r*) between item 35 (*To what extent do you think it is a good idea with group assessments*?) and the remaining items.

	Item 35	
	r	*p*
Item 1	−0.04	
Item 2	0.13	
Item 3	0.18	
Item 4	0.38	**
Item 5	0.54	**
Item 6	0.60	**
Item 7	0.69	**
Item 8	0.46	**
Item 9	0.29	*
Item 10	0.15	
Item 11	0.69	**
Item 12	0.63	**
Item 13	0.21	
Item 14	−0.22	
Item 15	0.33	*
Item 16	−0.04	
Item 17	0.30	*
Item 18	0.09	
Item 19	0.29	*
Item 20	−0.08	
Item 21	0.60	**
Item 22	−0.30	
Item 23	0.17	
Item 24	0.70	**
Item 25	0.53	**
Item 26	0.23	
Item 27	0.28	
Item 28	0.44	**
Item 29	0.72	**
Item 30	0.25	
Item 31	0.29	*
Item 32	0.46	**
Item 33	0.47	**
Item 34	0.23	
Item 35	1	-
Item 36	−0.65	**

Note: **Significant correlations at 0.01 level (double-tailed). *Significant correlations at 0.05 level (double-tailed).

4. Discussion

The main result of the present study showed that a majority of students consisting of 38 participants (68%) had a very positive approach to group assessments, while a minority of 18 participants (32%) was more skeptical or negative. Both groups generally had a positive view of both the CTS-R and the supervisors.

The most crucial aspects of the students' perceptions concerning attitudes to group assessments, was whether they felt that they had been fairly evaluated by their fellow students in the group (64 percent of the variance) and if they preferred an individual assessment with only the supervisor (16 percent of the variance). A full 80 percent of the variance in terms of attitude towards group assessments could thus be explained by only these two aspects! That a majority had a positive view of group assessment is in line with previous research as well as that a minority was more negative [4] [43] [44]. There is an extensive research on the characteristics of good supervision [4] [10] [16] [31] [43] [46] [47] [48]. Many highlight the strength of group supervision and there is a widespread belief that the group format provides the most effective conditions for learning. Among the benefits are, in addition to cost-effectiveness, the notion that the group can be used as a safe base for learning, a platform for developing skills and professional identity. However, there is also an established point of view that the group format is not uncomplicated, as was shown in the results of the present study where a third of the students were skeptical or negative to be assessed by their fellow students in the group. Group processes affects both learning and assessment. Such processes consist of factors that are unique to the group environment and create mechanisms that lead to changes in the group which affect the group's functioning. It has not been possible to find previously performed studies that analyzed the underlying factors of prospective psychotherapists' attitudes to group assessments based on the CTS-R.

The students expressed a firm belief in the CTS-R; they considered themselves familiar with the scale and regarded it as relevant for both describing and assessing therapist skills. Further, it may be worth noting that the students' views on the CTS-R was positive regardless attitude to group assessments, occupation, education level, gender or age. However, the negative group and the positive group differed in terms of the benefits they believed the scale had on their own learning processes. Correlation analysis indicated that this difference was associated with the experience of the group assessments. Results also showed that it was not the relationship to the supervisor or his/her evaluations that had been problematic. On the contrary, the students in both groups generally had a positive opinion of their supervisor. Instead, it was the extent to which participants considered themselves as fairly judged by their student colleagues that had the greatest impact on how they regarded group assessments, indicating that the question rather concerns the experiences of the group and the way the group functioned during the evaluations.

There were significant differences in terms of gender for only four items. Concerning the question of how the perception of the CTS-R was influenced by

the attitude of the supervisor, male participants experienced to a greater degree than female participants, that their attitude to the supervisor affected how they viewed the instrument. The remaining differences in regard to gender concerned questions of honesty in evaluations. The men were more likely to overestimate themselves compared to women. The men also expressed the opinion that colleagues more often had been honest in their evaluations, however, when this was not the case, the men thought that they had been somewhat underestimated by the colleagues. Contrary to the men, the women expressed that their colleagues to a lesser degree had been honest, and that they rather had been somewhat overrated by the colleagues. These results are in no way surprising, given that a very comprehensive early research has shown that women have a lower degree of self-confidence compared to men [49] [50].

There were no differences in terms of educational attainment for any of the 36 scales that is, whether the students attended basic education or the psychotherapist program. That there were no differences with respect to the group assessments is perhaps less surprising, since these attitudes were primarily related to the issue of groups and colleagues. But a difference could have been expected concerning the extent of familiarity for CTS-R, since students at undergraduate level had received less time and experience with the instrument. However there was no such difference and one possible explanation may be that the CTS-R is considered to be relatively easy to learn and to administer in relation to other, more extensive scales.

Participants who were psychologists rated lower on six of the survey questions as compared to the other professional groups. These questions concerned the familiarity of CTS-R, and questions about the perception of the supervisor and the training. The psychologists were generally less satisfied with the supervisors and the education than the other professions. Psychologists experienced to a lesser extent that the supervisor helped them to enhance their learning and their confidence during the assessments. They also expressed less benefit from the supervisors for their learning processes than the other occupations. The social workers were the professional group that rated themselves most familiar with the CTS-R and most comfortable with the supervisors' evaluations and comments, which they experienced, helped to strengthen their self-confidence. Social workers were also the professional group who were most satisfied with their education at large. Other health care staff, mainly nurses and physiotherapists, felt to a higher degree than the other professions that the supervisors' comments helped to strengthen their learning during the assessments. They also rated that they had been able to express their own views, if they thought that they were unfairly underestimated. The reason to the psychologists' response pattern may be linked to the fact that psychologists have more in-depth knowledge of psychotherapy and the highest status compared to social workers and other health care staff. Psychologists may have the least interest in mixed psychotherapy training. Reports from different programs indicate that fewer psychologists choose this path and rather choose the specialist training or psychotherapy training, only open to psychologists. It may be that social workers and other health care staff

are the ones who have the most to benefit and also those with the least prestige to defend.

The students were divided into three age categories and analyzes showed that there were no significant differences in regard to age. Thus, there was no obvious reason why age would be crucial concerning perception of the CTS-R or the group assessments. Admittedly, it is possible to argue that increased age brings greater life experiences which may be relevant in this context. But recent research suggests [51] that it is primarily a good climate and effective feedback systems on the psychotherapists' workplaces that have a positive impact on the development of skills rather than general life experience.

5. Conclusion

One limitation of the current study was that it relies on a small sample. On the other hand, there was a width with respect to professional groups, education level, gender and age. The results also showed that the attitude to group assessments was not related to these factors, but mainly focused on factors related to the evaluation process, and especially the assessments from the fellow students in the group. More studies with the same focus are needed to determine the extent to which the results are generalizable. To further improve the learning process and assessments of therapist skills, it would be of great interest to get more studies from a qualitative perspective, focusing on the students' own experience of performance evaluations together with the supervisors and student colleagues. Also qualitative studies investigating the interactions between students and their patients [52] [53] may provide a basis for further improvements of tutoring in educational groups. Bieling and colleagues [44] are among the few who both researched and proved that process factors had a significant impact on the outcome in treatment groups. They argue that this area leaves a large potential for development and improvement concerning outcome in treatment groups. The same would apply to training and mentoring of aspiring therapists. Green [54] highlighted the irony that the most empirically studied group, therapy approach (CBT) ignores the group as a "group" and as a potential therapeutic agent in itself. The results of this study support the hypothesis that the group as a "group" is very important for the learning process in CBT tutorial.

Acknowledgements

All authors had contributed substantially to the design, performance, analysis, and reporting of the work. The authors thank the participants for taking the time to participate in the study.

Conflict of Interest

The authors confirm that this article content has no conflicts of interest.

References

[1] World Health Organization. Mental Health Action Plan, 2013-2020. Geneva.

http://apps.who.int/iris/bitstream/10665/89966/1/9789241506021_eng.pdf?ua=1

[2] Swedish National Board of Health (2016) Nationella riktlinjer för vård vid depression och ångestsyndrom. http://www.socialstyrelsen.se/publikationer

[3] Butler, A.C., Chapman, J.E., Forman, E.M. and Beck, A.T. (2006) The Empirical Status of Cognitive-Behavioral Therapy: A Review of Meta-Analyses. *Clinical Psychology Review*, **26**, 17-31.

[4] Bates, S. (2013) Handledning ur ett KBT-perspektiv [Supervision from a CBT Perspective]. Natur och Kultur, Stockholm.

[5] Angantyr, K., Rimner, A., Nordén, T. and Norlander, T. (2015) Primary Care Behavioral Health Model: Perspectives of Outcome, Client Satisfaction, and Gender. *Social Behavior and Personality*: *An International Journal*, **43**, 287-301. https://doi.org/10.2224/sbp.2015.43.2.287

[6] Norlander, T., Ernestad, E., Moradiani, Z. and Nordén, T. (2015) Perceived Feeling of Security: A Candidate for Assessing Remission in Borderline Patients? *Open Psychology Journal*, **8**, 146-152. https://doi.org/10.2174/1874350101508010146

[7] Fairburn, C.G. and Cooper, Z. (2011) Therapist Competence, Therapy Quality, and Therapist Training. *Behaviour Research and Therapy*, **49**, 373-378.

[8] Bennett-Levy, J., McManus, F., Westling, B.E. and Fennell, M. (2009) Acquiring and Refining CBT Skills and Competencies: Which Training Methods Are Perceived to Be Most Effective? *Behavioural and Cognitive Psychotherapy*, **37**, 571-583. https://doi.org/10.1017/S1352465809990270

[9] Ranson, A., Shafran, R. and Myles, P. (2015) Investigating the Relationship between Competence and Patient Outcome with CBT. *Behaviour Research and Therapy*, **68**, 19-26.

[10] Milne, D. (2009) Evidence-Based Clinical Supervision: Principals and Practice. Wiley-Blackwell, Chichester.

[11] Sharpless, B.A. and Barber, J.P. (2009) A Conceptual and Empirical Review of the Meaning, Measurement, Development, and Teaching of Intervention Competence in Clinical Psychology. *Clinical Psychology Review*, **29**, 47-56.

[12] Bandura, A. (1961) Psychotherapy as a Learning Process. *Psychological Bulletin*, **58**, 143. https://doi.org/10.1037/h0040672

[13] Bandura, A. (1977) Social Learning Theory. General Learning Press, New York.

[14] Cook, J.M., Schnurr, P.P., Biyanova, T. and Coyne, J.C. (2009) Apples Don't Fall Far from the Tree: Influences on Psychotherapists' Adoption and Sustained Use of New Therapies. *Psychiatric Services*, **60**, 671-676. https://doi.org/10.1176/ps.2009.60.5.671

[15] Watkins, C.E. (2012) Development of the Psychotherapy Supervisor: Review of and Reflections on 30 Years of Theory and Research. *American Journal of Psychotherapy*, **66**, 45-83.

[16] Milne, D.L., Reiser, R.P. and Cliffe, T. (2013) An N = 1 Evaluation of Enhanced CBT Supervision. *Behavioural and Cognitive Psychotherapy*, **41**, 210-220. https://doi.org/10.1017/S1352465812000434

[17] Lilja, J.L., Zelleroth, C., Axberg, U. and Norlander, T. (2016) Mindfulness-Based Cognitive Therapy Is Effective as Relapse Prevention for Patients with Recurrent Depression in Scandinavian Primary Health Care. *Scandinavian Journal of Psychology*, **57**, 464-472. https://doi.org/10.1111/sjop.12302

[18] Perepletchikova, F., Treat, T.A. and Kazdin, A.E. (2007) Treatment Integrity in Psychotherapy Research: Analysis of the Studies and Examination of the Associated Factors. *Journal of Consulting and Clinical Psychology*, **75**, 829-841.

https://doi.org/10.1037/0022-006X.75.6.829

[19] Clark, D.M., Layard, R., Smithies, R., Richards, D.A., Suckling, R. and Wright, B. (2009) Improving Access to Psychological Therapy: Initial Evaluation of Two UK Demonstration Sites. *Behaviour Research and Therapy*, **47**, 910-920.

[20] DeRubeis, R.J., Hollon, S.D., Amsterdam, J.D., Shelton, R.C., Young, P.R., Salomon, R.M., Gallop, R., *et al.* (2005) Cognitive Therapy vs. Medications in the Treatment of Moderate to Severe Depression. *Archives of General Psychiatry*, **62**, 409-416. https://doi.org/10.1001/archpsyc.62.4.409

[21] Trepka, C., Rees, A., Shapiro, D.A., Hardy, G.E. and Barkham, M. (2004) Therapist Competence and Outcome of Cognitive Therapy for Depression. *Cognitive Therapy and Research*, **28**, 143-157. https://doi.org/10.1023/B:COTR.0000021536.39173.66

[22] Padesky, C.A. (1996) Developing Cognitive Therapist Competency: Teaching Supervision Models. In: Salkovskis P.M., Ed., *Frontiers of Cognitive Therapy*, Guilford Press, London, 266-292.

[23] Liese, B.S. and Beck, J.S. (1997) Cognitive Therapy Supervision. In: Watkins, C.E., Ed., *Handbook of Psychotherapy Supervision*, John Wiley & Sons, Chichester, 114-133.

[24] Bennett-Levy, J. (2006) Therapist Skills: A Cognitive Model of Their Acquisition and Refinement. *Behavioural and Cognitive Psychotherapy*, **34**, 57-78. https://doi.org/10.1017/s1352465805002420

[25] Croona Olde, C. (2013) Psykologen i rollen som handledare. Enlitteraturstudie [The Psychologist in the Role of Supervisor. A Review]. Sverigespsykologförbund, Stockholm.

[26] Kolb, D. (1984) Experimental Learning: Experience as the Source of Learning and Development. Prentice Hall, Englewood Cliffs.

[27] Vygotskij, L.S. (1978) Interaction between Learning and Development. In: Cole, M., Ed., *Mind in Society*: *The Development of Higher Psychological Processes*, Harvard University Press, Cambridge, 79-91.

[28] Fahlgren, R. (2008) Hur gör handledare? Centralaaspekteri KBT-Oriented Handledning [How Does a Supervisor Perform? Central Aspects of CBT-Oriented Supervision]. Stockholm University, Stockholm.

[29] Milne, D.L., Baker, C., Blackburn, I.M., James, I. and Reichelt, K. (1999) Effectiveness of Cognitive Therapy Training. *Journal of Behavior Therapy and Experimental Psychiatry*, **30**, 81-92.

[30] Shaw, B.F. and Dobson, K.S. (1988) Competency Judgments in the Training and Evaluation of Psychotherapists. *Journal of Consulting and Clinical Psychology*, **56**, 666-672. https://doi.org/10.1037/0022-006X.56.5.666

[31] Milne, D.L., Reiser, R.P., Cliffe, T., Breese, L., Boon, A., Raine, R. and Scarratt, P. (2011) A Qualitative Comparison of Cognitive-Behavioural and Evidence-Based Clinical Supervision. *The Cognitive Behaviour Therapist*, **4**, 152-166. https://doi.org/10.1017/S1754470X11000092

[32] Young, J. and Beck, A.T. Cognitive Therapy Scale Rating Manual. University of Pennsylvania, Philadelphia.

[33] Dobson, K.S., Shaw, B.F. and Vallis, T.M. (1985) Reliability of a Measure of the Quality of Cognitive Therapy. *British Journal of Clinical Psychology*, **24**, 295-300. https://doi.org/10.1111/j.2044-8260.1985.tb00662.x

[34] Safran, J.D. and Segal, Z.V. (1990) Therapy Adherence Rating Scale. Interpersonal process in Cognitive Therapy. Basic Books, New York.

[35] Barber, J.P., Liese, B.S. and Abrams, M.J. (2003) Development of the Cognitive The-

rapy Adherence and Competence Scale. *Psychotherapy Research*, **13**, 205-221. https://doi.org/10.1093/ptr/kpg019

[36] Muse, K., McManus, F., Rakovshik, S. and Thwaites, R. (2016) Development and Psychometric Evaluation of the Assessment of Core CBT Skills (ACCS): An Observation-Based Tool for Assessing Cognitive Behavioral Therapy Competence. Psychological Assessment. https://doi.org/10.1037/pas0000372

[37] Mathieson, F.M., Barnfield, T. and Beaumont, G. (2010) Are We as Good as We Think We Are? Self-Assessment versus Other Forms of Assessment of Competence in Psychotherapy. *The Cognitive Behaviour Therapist*, **2**, 43-50. https://doi.org/10.1017/S1754470X08000081

[38] Padesky, C.A., Kuyken, W. and Dudley, R. (2011) Collaborative Case Conceptualization Rating Scale & Coding Manual. Guilford Publications, New York.

[39] Roth, A.D. (2016) A New Scale for the Assessment of Competences in Cognitive and Behavioural Therapy. *Behavioural and Cognitive Psychotherapy*, **44**, 620-624. https://doi.org/10.1017/S1352465816000011

[40] Blackburn, I.M., James, I.A., Milne, D.L., Baker, C., Standart, S., Garland, A. and Reichelt, F.K. (2001) The Revised Cognitive Therapy Scale (CTS-R): Psychometric Properties. *Behavioural and Cognitive Psychotherapy*, **29**, 431-446. https://doi.org/10.1017/s1352465801004040

[41] Dreyfus, H.L. (1989) The Dreyfus Model of Skill Acquisition. In: Burke, J., Ed., *Competency Based Education and Training*, Falmer Press, London, 181-183.

[42] Jacobsson, P., Carlsson, J., Lundgren, M. and Ek, H. (2007) Assessing Competence in Cognitive Psychotherapy. A Validation Study of a Swedish Rating Scale. Centrum för Kognitiv Psykoterapioch Utbildning, Gothenburg.

[43] Kuechler, C.F. (2007) Practitioners' Voices: Group Supervisors Reflect on Their Practice. *The Clinical Supervisor*, **25**, 83-103. https://doi.org/10.1300/J001v25n01_07

[44] Bieling, P.J., McCabe, R.E. and Antony, M.M. (2006) Cognitive-Behavioral Therapy in Groups. Guilford Press, New York.

[45] Kåver, A. (2006) KBT i utveckling. En introduktion till kognitiv beteendeterapi [CBT in Development. An Introduction to Cognitive Behavioral Therapy]. Natur-och Kultur, Stockholm.

[46] Milne, D. and Dunkerley, C. (2010) Towards Evidence-Based Clinical Supervision: The Development and Evaluation of Four CBT Guidelines. *The Cognitive Behaviour Therapist*, **3**, 43-57. https://doi.org/10.1017/S1754470X10000048

[47] Watkins, C.E. (1997) Handbook of Psychotherapy Supervision. John Wiley & Sons, New York.

[48] Watkins, C.E. (2012) Educating Psychotherapy Supervisors. *American Journal of Psychotherapy*, **66**, 297-307.

[49] Spence, J.T., Helmreich, R. and Stapp, J. (1975) Ratings of Self and Peers on Sex Role Attributes and Their Relation to Self-Esteem and Conceptions of Masculinity and Femininity. *Journal of Personality and Social Psychology*, **32**, 29. https://doi.org/10.1037/h0076857

[50] Norlander, T., Erixon, A. and Archer, T. (2000) Psychological Androgyny and Creativity: Dynamics of Gender-Role and Personality Trait. *Social Behavior and Personality*, **28**, 423-435. https://doi.org/10.2224/sbp.2000.28.5.423

[51] Goldberg, S.B., Babins-Wagner, R., Rousmaniere, T., Berzins, S., Hoyt, W.T., Whipple, J.L., Wampold, B.E., *et al.* (2016) Creating a Climate for Therapist Improvement: A Case Study of an Agency Focused on Outcomes and Deliberate Prac-

tice. *Psychotherapy*, **53**, 367. https://doi.org/10.1037/pst0000060

[52] Ingvarsson, T., Nordén, T. and Norlander, T. (2014) Mindfulness-Based Cognitive Therapy: A Case Study on Experiences of Healthy Behaviors by Clients in Psychiatric care. *Open Journal of Medical Psychology*, **3**, 390-402. https://doi.org/10.4236/ojmp.2014.35041

[53] Lilja, J.L., Broberg, M., Norlander, T. and Broberg, A.G. (2015) Mindfulness-Based Cognitive Therapy: Primary Care Patients' Experiences of Outcomes in Everyday Life and Relapse Prevention. *Psychology*, **6**, 464-477. https://doi.org/10.4236/psych.2015.64044

[54] Greene, L.R. (2000) Process Analysis of Group Interaction in Therapeutic Groups. In: Beck, A. and Lewis, C., Eds., *The Process of Group Psychotherapy*: *Systems for Analyzing Change*, American Psychological Association, Washington DC, 23-47. https://doi.org/10.1037/10378-002

Scientific Research Publishing

Open Journal of Medical Psychology, 2017, 6, 197-212
http://www.scirp.org/journal/ojmp
ISSN Online: 2165-9389
ISSN Print: 2165-9370

The Effect of Aerobic Indoor Exercise Compared with Green Exercise on Different Symptoms of Depression: An Investigation of Psychological Mediators of Stress and Coping

Jafar Askari[1], Alireza Saberi-Kakhki[2*], Hamidreza Taheri[2], Seyyed Mojtaba Yassini[3]

[1]Department of Psychology, Imam Reza International University, Mashhad, Iran
[2]Department of Motor Behavior, Faculty of Physical Education and Sport Sciences, Ferdowsi University of Mashhad, Mashhad, Iran
[3]Department of Psychiatry, Shahid Sadoughi University of Medical Sciences, Yazd, Iran
Email: jaskari@ssu.ac.ir, *askakhki@um.ac.ir, hamidtaheri@um.ac.ir, yassini@ssu.ac.ir

How to cite this paper: Askari, J., Saberi-Kakhki, A., Taheri, H. and Yassini, S.M. (2017) The Effect of Aerobic Indoor Exercise Compared with Green Exercise on Different Symptoms of Depression: An Investigation of Psychological Mediators of Stress and Coping. *Open Journal of Medical Psychology*, **6**, 197-212.
https://doi.org/10.4236/ojmp.2017.63016

Received: February 14, 2017
Accepted: June 30, 2017
Published: July 3, 2017

Abstract

Objectives: Considering the growing need for using a variety of new non-pharmacological methods in treating depression, this quasi experimental study was conducted to investigate the effect of aerobic indoor exercise in a gym compared with green exercise in an outdoor green environment of an urban park on triple categories of affective, cognitive and somatic symptoms of depression and to examine its psychological mediators of perceived stress and coping strategies. **Methods:** Forty six female outpatients with major depressive disorder were divided into 3 conditions of indoor exercise + routine pharmacotherapy (n = 15), green exercise + routine pharmacotherapy (n = 15), and a routine pharmacotherapy alone as the control group (n = 16). The exercise used for both indoor and green exercise conditions consisted of 36 one hour sessions (three times per week) with an intensity of 50% - 70% of the maximum heart rate. The participants completed the pre- and post-intervention depression, stress and coping questionnaires including Beck Depression Inventory-II, Perceived Stress Scale and Coping Inventory for Stressful Situations. **Results:** The findings indicated a significant decrease in the post-intervention scores of all three categories of affective, cognitive and somatic symptoms of depression and perceived stress in both exercise groups compared with the control group, but there was no significant difference between two exercise groups. With respect to the use of problem-focused, emotion-focused and avoidant-focused coping methods, there was no significant difference between post-intervention scores of all groups. **Conclusion:** In the clinical settings, both of the indoor exercise and green exercise programs can

help to further improvement in all three categories of affective, cognitive and somatic symptoms of depression as an adjunct (or independent) treatment to the same degree, especially mediated by reducing the amount of perceived stress, but not through any significant changes in cognitive-behavioral coping strategies.

Keywords

Exercise and Physical Activity, Major Depressive Disorder, Perceived Stress, Coping Strategies

1. Introduction

Major depressive disorder is considered as one of the most common psychological disorders around the world especially in women [1]. Treatment of depression is typically performed through the use of medicines, psychotherapy or a combination of both [2]. Yet one-third of the patients do not respond favorably to these treatments [3]. Additionally, to avoid side effects many patients are not willing to use medication and on the other hand, since psychotherapy requires considerable cognitive and intellectual capacity, researchers have become increasingly interested in using exercise and physical activity as an adjunct or independent procedure in treating depression [4].

Some studies conducted in this field showed a significant difference in the rate of depression improvement in exercise groups in which aerobic exercise was added to the routine drug and electroshock treatment protocol [4] [5] [6] [7] [8]. An important point here is that the use of high intensity exercise (75% - 85% HR_{max}) is not plausible in patients with depression and does not agree with the public health recommendations [9]. Nevertheless, the present evidence is relatively contradictory still [3] and some experimental studies do not show the effective role of exercise and physical activity in reducing depression [10] [11]. Therefore, some researchers believe that more studies are required to draw an accurate conclusion in this regard [6]. Furthermore, although there is good evidence obtained particularly from cross-sectional studies in the general population, it seems that there is a considerable need for further examination in the clinical settings, especially on depressed outpatients. In this regard, an important subject left unaddressed in other studies is that which affective, cognitive, and somatic categories of depression symptoms are more affected by exercise and physical activity. Accordingly, an aim of this study is to find out if exercises lead to reduced depression, this reduction is achieved mainly from improvement in which groups of depression symptoms.

Moreover, studies have shown that combining exercise and physical activity with green environment (exercising in an outdoor green space) which is known as the green exercise versus indoor exercise entails double beneficial outcomes [12]. Recently some findings suggested that green exercise can have double

beneficial effect on improving the psychological well-being [12] [13] [14] [15]. There are two theories to justify the effect of green nature on mental health. First, the psycho physiological stress recovery theory [16] explains that the pleasant feeling due to exposure to a natural beautiful scene reduces physiological excitation and induces physical and psychological calmness. Second, in the attention restoration theory [17] it is also believed that when we are tired of various problems, looking at natural sceneries without concentrating on any specific problem leads to relaxation and less fatigue. However, given that most research in this field has been done on non-clinical samples and as Mackay and Neill [13] have emphasized, seemingly that to clarify additional effects of green exercise on psychological well-being especially in depressed outpatients, further studies is needed, and this is one of the objectives of the present study.

Another important issue of this study is investigating the underlying psychological mechanisms of the effect of exercise and physical activity on depression. In this regard it seems that the level of perceived stress can be considered as a mediating factor that justifies the relationship between physical activity and depression [18]. Various clinical findings suggest that stress plays an important role in the etiology of depression [19]. On the other hand, it seems that exercise and physical activity can protect the individual against the negative consequences of stress and related disorders such as depression [20]. Although, there are some contest and disagreement on the extent to which exercise can reduce the individual's sensitivity to the psychosocial stress [21]. There is also no clear evidence indicating whether the psychological reactions of stress reduce parallel to the reduction in physiological reactions induced by exercise and physical activity and present empirical evidence in this area is somewhat contradictory [22]. Because of these inconsistencies, many researchers have emphasized the need for more studies [23] and it is another objective of this study.

In addition to the effect of exercise on the level of perceived stress, the cognitive-behavioral responses of patients with depression for coping with stress and the effects of exercise on this variable are very important. However, until now the effect of exercise and physical activity on changes in usage degree of triple methods of problem-focused, emotion-focused, and avoidant-focused coping with stress has not been addressed extensively. According to Folkman and Lazarus [24] stress coping methods can be divided into two categories: Problem-focused coping which includes trying to resolve the stressor and emotion-focused coping which includes trying to relieve the negative emotions induced by stressors. Later, Endler and Parker [25] added a third category called avoidant-focused coping including avoiding the problem or engaging oneself with other activities. Studies conducted in this field show that the individuals with depression use emotion-focused and avoidant-focused coping methods significantly more and problem-focused coping method less frequently than other individuals [26] [27] [28]. Although, based on some researches [29], exercise and physical activity can improve coping with stress, but there is no considerable evidence about the effect of exercise on coping. Therefore, some researchers

emphasize on the need for more comprehensive interventional studies on different clinical and nonclinical populations to determine the exact efficiency of exercise and physical activity on stress coping strategies [29]. Hence, regarding the important role of coping with stress in the prevention, treatment and rehabilitation of depression, investigating the essential role of this factor in the effect of exercise on depression is the final objective of the present study.

In summary, considering the growing need for using a variety of new non-pharmacological methods in treating depression, in the present study as one of the few studies in this area on depressed outpatients, we aimed to answer the following three questions whether adding aerobic indoor or green exercise to routine pharmacotherapy compared to the condition of routine pharmacotherapy alone, and whether adding green exercise to routine pharmacotherapy, compared to the condition of adding indoor exercise to routine pharmacotherapy, can 1) Make a significant decrease in all the three categories of affective, cognitive and somatic symptoms of depression or not? 2) Lead to a significant decrease in the level of perceived stressor not? 3) Cause a significant helpful change in using of cognitive-behavioral methods of problem-focused, emotion-focused and avoidant-focused coping with stress or not?

2. Methods

2.1. Design and Participants

This quasi-experimental study was conducted with two experimental and one control groups. The Participants were selected from the patients presenting to a psychiatric hospital (Bahman hospital in Yazd, Iran) during June-September 2014. This study was approved by the local ethics committee (IR.MUMS.REC.1395.6) and was registered as a clinical trial in Iranian registry of clinical trials (http://www.irct.ir) (Register Code: IRCT2016082929598N1).

Research samples were selected from the patients who tended to voluntarily participate in the study using convenience-sampling method. The inclusion criteria were the following: Female patients aged 20 - 50 years who were affected with moderate to severe major depressive disorder diagnosed by a psychiatrist via clinical interview based on the fifth version of the diagnostic and statistical manual of mental disorders (DSM-5) [30] and a minimum score of 20 on the Beck Depression Inventory-II (BDI-II) [31], not being engaged in other mental treatments and physical activity programs during the study period, confirming their willingness to participate in the research and sign the informed consent statement. The exclusion criteria were the following: Patients who were affected with other important mental disorders (e.g., schizophrenia, bipolar disorder, drug and alcohol abuse) and any medical condition that affects their depression (e.g., hypothyroidism and diabetes) or limits their physical activity (e.g., cardiovascular and musculoskeletal problems).

2.2. Procedures

The sample used in the study included one experimental group of indoor exer-

cise + routine pharmacotherapy, a comparison group of green exercise + routine pharmacotherapy, and a control group of routine pharmacotherapy alone. During the enrollment, the first and second 18 eligible patients allocated to the aerobic indoor and green exercise interventions, respectively. The last third group, containing another 18 eligible patients, underwent only routine pharmacotherapy. To register the participants after referral by psychiatrist, they must have completed demographic data form and the research questionnaires including depression, stress and coping pre-tests at the psychiatric clinic in the form of face to face interview. Resting heart rate was also recorded after a few minutes of resting in sitting position. Enrollment of the patients in each group usually lasted approximately 2 to 4 weeks. Therapeutic intervention was started after finishing all of the enrollments and pre-tests. Post-tests were also conducted at a time within the first day immediately after the finishing of interventions. To enhance the patients' cooperation during the study, researchers paid all costs and expenses incurred (e.g. the costs of transportation, gym and laboratory tests).

2.2.1. Aerobic Indoor and Green Exercise Programs

In the exercise conditions, beside routine medication the participants performed group aerobic exercise for 60 min associated with rhythmic music three sessions per week for three months with a low to medium intensity of 50% - 70% of the maximum heart rate (HR_{max}). According to various ages of the participants ranging from 20 to 50 years, the intensity of physical activity in the indoor exercise group varied from at least 87.20 bpm (50% HR_{max}) in the oldest patient (48 years old) to 135.80 bpm (70% HR_{max}) in the youngest patient (20 years old) and in the green exercise group varied from at least 86.85 bpm (50% HR_{max}) in the oldest patient (49 years old) to 135.80 bpm (70% HR_{max}) in the youngest patient (20 years old). During each session, the total exercise time and intensity of physical activity were controlled by one of the research staff. Indoor exercise was performed in a gym of 90 m^2 space without the presence of others and under supervision of a coach. Green exercise was performed in a 120 m^2 open space in a park of approximately 4000 m^2 space including tree-planted, grass, flowers and waterfront under the supervision of a coach. During green exercise sessions other women were also present at the site. The time of holding the indoor exercise was in the summer of 2014 between 18 - 19 p.m. with an approximate temperature of 20˚C and the time of green exercise was during the late summer and early autumn between 16:30 - 17:30 p.m. with an approximate temperature of 25˚C - 30˚C. Due to the national yearly holidays, two sessions of indoor and three sessions of the green exercise were cancelled.

Aerobic exercise with rhythmic music were performed in this study as follows: 1) About 10 - 15 min of gentle stretching exercise for warming up the body as approved by other studies such as Law and Herbert [32], 2) The main body of exercise included 30 - 40 min of faster exercise including various movements of hands, feet, and trunk in the sitting and standing positions, 3) About 10 - 15 min of gentle stretching exercise for cooling down the body whose benefits have been

confirmed by other researchers such asMallion, Rokka, Beneka, Mavridis, and Godolias [33]. During the study, the patients in these groups were receiving routine pharmacotherapy in addition to participation in exercise sessions.

2.2.2. Routine Pharmacotherapy

The members of this group just received pharmacotherapy and they were not involved in ECT, psychotherapy or any kind of physical activities. The medications consumed by the participants were included tricyclic antidepressants (clomipramine, imipramine and trimipramine), selective serotonin reuptake inhibitors (SSRIs) (fluoxetine, citalopram and sertraline), norepinephrine-dopamine reuptake inhibitors (NDRIs) (bupropion), benzodiazepines (alprazolam and chlordiazepoxide) and other anti-anxiety drugs and tranquilizers (propranolol, trifluoperazine and perphenazine). The type and dosage of medications for each patient were determined by the psychiatrist.

2.3. Measures

2.3.1. Intensity of Physical Activity and Resting Heart Rate

HR_{max} measured by the digital heart rate monitor Beurer model PM110 made in Germany was used to determine the intensity of physical activity. HR_{max} is commonly used as an index for prescribing exercise intensity in rehabilitation programs [34]. The formula: "$208 - 0.7 \times age$" [35] was also used here in identifying HR_{max}. HR_{max} divides intensity of physical activities to the low (50% - 65% HR_{max}), medium (65% - 75% HR_{max}), and high (75% - 85% HR_{max}) levels [36]. Resting heart rate was also measured by the monitor.

2.3.2. Depression

The Persian version of the Beck Depression Inventory-II (BDI-II) [31] was applied to measure the before and after intervention depression in the experimental and control groups. BDI-II has 21 sections and each sections cored on a Likert scale of 0 - 3 points yielding a total score of 0 - 63. The scores 0 - 13 are classified as minimal depression, 14 - 19 as mild to moderate depression, 20 - 28 as moderate to severe depression and above 29 as severe depression [31]. The BDI-II is one of the most powerful used instruments for measuring the severity of depression and has a high reliability and acceptable concurrent, content, and structural validity [37]. In a study [38] the reliability and validity of the Persian version of this inventory was estimated to be very satisfactory.

2.3.3. Stress

The Persian version of the 10-item Perceived Stress Scale (PSS-10) [39] was used to assess perceived stress. This test is scored on a 5-point Likert scale scored from 0 (never) to 4 (most of the time). Items 4, 5, 7 and 8 are scored in reverse. Accordingly, the total score will range from 0 - 40. The scores 0 - 7 indicate very low stress, 8 - 11 low, 12 - 15 average, 16 - 20 high, and above 21 very high stress [39]. The reliability and validity of the original version of this scale [40] and those of the Persian version [41] are optimal and acceptable.

2.3.4. Coping

The Persian version of Coping Inventory for Stressful Situations (CISS) developed by Endler and Parker [42] was used to assess the methods of stress coping. This inventory consists of 48 items measuring the three methods of coping including problem-focused (16 items), emotion-focused (16 items), and avoidant-focused (16 items) methods. The answer to each question is based on a five-point Likert scale including 1 (never) to 5 (very high) and so the total score of each section varies between 16 to 80. The reliability and validity of the original version [43] and those of the Persian version [44] has been approved.

2.4. Sample Size

Based on a two sided confidence interval of 95%, test power of 80%, standard deviation of 11 with regard to BDI-II scores from some former studies, and in order to attain a significant difference based on a minimum difference of 12 between group mean scores, sample size was chosen to be three groups of 15. A total of 3 individuals (20%) were then added to each group in order to compensate for subject loss. As such, the final number of individuals in each group was 18.

2.5. Statistical Analysis

Data were analyzed using the SPSS-20 software. Regarding the normal distribution of the data based on Klomogrov-Smironov test ($p > 0.05$), the parametric statistics of one-way ANOVA, ANCOVA, MANCOVA, Bonfereni post hoc test and partial eta squared were used as appropriated. One-way ANOVA was used to compare the pre-test scores of demographic characteristics, clinical symptoms (depression, perceived stress, and coping strategies), and the doses of consumed medications of the three study groups. ANCOVA, MANCOVA, and Bonferroni test in addition to partial eta squared were also used to check the observed differences between the pre- and post-test scores of clinical variables, and calculate effect size, respectively.

3. Results

A total of 105 patients were referred to participate in the study. Of these patients, 51 (48.5%) excluded from the study and 54 were non-randomly allocated to the indoor exercise ($n = 18$), green exercise ($n = 18$) and control ($n = 18$) groups. Among the 54 patients that met the criteria and were invited to participate in the study, 8 (14.8%) dropped out in the early stages of the study (three in each of the exercise groups and two in the control group). The dropouts were because of lack of motivation to exercise and lack of required physical preparation in the two exercise groups, and discontinuing the use of drugs because of their side effects in the control group. Therefore, the research data were analyzed using 15, 15 and 16 patients in the indoor exercise, green exercise and control groups, respectively.

3.1. Baseline Findings

Table 1 shows the baseline demographic characteristics and pre-intervention

Table 1. Baseline demographic characteristics and pre-intervention scores of the major study variables.

Measures	1—indoor exercise (n = 15) M (SD)	2—green exercise (n = 15) M (SD)	3—control (n = 16) M (SD)	$F(2, 43)$	p
Age (years)	34.40 (8.33)	32.46 (8.52)	33.31 (6.95)	0.22	0.801
Education (years)	10 (4)	10.26 (2.98)	11.12 (3.48)	0.43	0.649
Height (cm)	163.06 (7.37)	164.93 (6.64)	166.31 (3.71)	1.11	0.339
Weight (kg)	76.33 (8.48)	75.46 (8.39)	73.31 (7.31)	0.58	0.564
Rest heart rate (bpm)	84.60 (5.06)	83.86 (8.57)	84.43 (6.99)	0.04	0.956
BDI-II (Total score)	36.33 (9.67)	35.93 (11.60)	40.87 (10.62)	1.03	0.363
BDI-II (Affective symptoms)	12.73 (3.75)	12.93 (4.26)	14.31 (4.31)	0.68	0.512
BDI-II (Cognitive symptoms)	14.33 (5.36)	13.40 (4.80)	16.50 (4.97)	1.54	0.225
BDI-II (Somatic symptoms)	9.33 (2.12)	9.60 (4.03)	10.06 (2.81)	0.22	0.802
PSS-10	27.93 (7.04)	25.93 (7.71)	30.62 (7.22)	1.60	0.213
CISS (P-FC)	39.26 (14.55)	36.93 (14.37)	37.18 (15.98)	0.11	0.896
CISS (E-FC)	59.93 (10.11)	56.86 (8.87)	57 (14.61)	0.34	0.713
CISS (A-FC)	29.66 (8.99)	35.40 (13.45)	29.12 (9.63)	1.56	0.221

Note. bpm = beats per minute; BDI-II = Beck Depression Inventory-II; PSS = Perceived Stress Scale; CISS = Coping Inventory for Stressful Situations; P-FC = Problem-Focused Coping; E-FC = Emotion-Focused Coping; A-FC = Avoidant-Focused Coping.

scores of the major study variables. The total means (standard deviations) of age, education, height, weight and resting heart rates of all groups were 33.39 (7.81) years, 10.47 (3.46) years, 164.80 (6.09) cm, 75 (7.98) kg, and 84.30 (6.87) bpm, respectively. The total means (standard deviations) of pre-intervention scores obtained on the major study variables in the three groups were as follows: BDI-II: total score: 37.78 (10.67), affective symptoms: 13.34 (4.09), cognitive symptoms: 14.78 (5.11), and somatic symptoms: 9.67 (3.03); PSS-10: 28.21 (7.42); CISS: problem-focused coping: 37.78 (14.71), emotion-focused coping: 57.91 (11.38), and avoidant-focused coping: 31.34 (10.98). Based on a one-way between groups ANOVA, there was no statistically significant difference among the three groups regarding all baseline demographic characteristics and major study variables (see Table 1). According to baseline findings, the participants were affected with moderate to severe depression, very high degrees of stress, and greater use of emotion-focused coping compared to problem-focused and avoidant-focused coping methods. There was also no significant difference between the average doses of medications taken by the groups of indoor exercise (M = 149.53, SD = 85.83), green exercise (M = 136.53, SD = 94.99), and control group (M = 154.56, SD = 84.38) mg, $F(2, 43) = 0.17$, $p = 0.844$). In addition, the average length of affliction with depression for all of the three groups was 16.22 (11.37) months.

3.2. Exercise Effects on Depression

Post-tests comparison of the total depression scores using an ANCOVA demon-

strated a significant difference in the three groups ($F(2, 43) = 9.98$, $p = 0.001$, $\eta_p^2 = 0.32$) (see Table 2). Post-hoc comparisons using the Bonferroni test indicated that the post-test mean scores for indoor exercise ($M = 18.46$, $SD = 11.64$) and green exercise ($M = 18.27$, $SD = 8.44$) conditions were significantly different from control condition ($M = 32.93$, $SD = 10.50$). Based on a MANCOVA this difference was also observed in all the triple affective ($F(2, 43) = 9.82$, $p = 0.001$, $\eta_p^2 = 0.33$), cognitive ($F(2, 43) = 5.72$, $p = 0.007$, $\eta_p^2 = 0.22$), and somatic ($F(2, 43) = 9.99$, $p = 0.001$, $\eta_p^2 = 0.33$) subscales at BDI-II. These results suggest that participating in an exercise program truly has a positive effect on further improvement of all triple categories of depression symptoms. But importantly, there was no significant difference between the two indoor and green exercise conditions regarding the post-intervention decrease in the amount of depression scores.

3.3. Exercise Effects on Stress and Coping

Post-tests comparison of the three groups using an ANCOVA and post hoc Bonferroni test indicated a significantly reduced perceived stress ($F(2, 43) = 8.46$, $p = 0.006$, $\eta_p^2 = 0.16$) in both indoor and green exercise conditions compared with the control condition (see Table 2). These results suggest that participating in the two exercise programs can lead to a significant reduction in the amount of perceived stress. More importantly, similar to the depression variable, there was no significant difference between the two exercise conditions regarding the post-intervention decrease in the amount of perceived stress.

In addition, in the post intervention scores for stress coping strategies including problem-focused ($F(2, 43) = 1.84$, $p = 0.172$, $\eta_p^2 = 0.08$), emotion-focused

Table 2. Post-intervention comparison of the major study variables in the three groups.

Measures	1—indoor exercise ($n = 15$) M (SD)	2—green exercise ($n = 15$) M (SD)	3—control ($n = 16$) M (SD)	$F(2, 43)$	p	η_p^2	Bonfereni
BDI-II (Total score)	18.46 (11.64)	18.27 (8.44)	32.93 (10.50)	9.98	0.001	0.32	1, 2 < 3
BDI-II (Affective symptoms)	6.33 (3.77)	6.60 (3.81)	11.68 (4.34)	9.82	0.001	0.33	1, 2 < 3
BDI-II (Cognitive symptoms)	7.73 (6.09)	7.20 (3.61)	13.31 (4.52)	5.72	0.007	0.22	1, 2 < 3
BDI-II (Somatic symptoms)	4.40 (2.55)	4.47 (2.20)	7.93 (2.51)	9.99	0.001	0.33	1, 2 < 3
PSS-10	16.60 (6.68)	15.53 (6.26)	27.06 (6.27)	8.46	0.006	0.16	1, 2 < 3
CISS (P-FC)	47.26 (15.34)	45.60 (9.37)	40.87 (13)	1.84	0.172	0.08	---
CISS (E-FC)	47.53 (8.22)	49.26 (9.90)	54.37 (13.64)	1.79	0.179	0.08	---
CISS (A-FC)	31.46 (8.72)	35.80 (12.04)	30.50 (10.26)	0.52	0.598	0.02	---

Note. BDI-II = Beck Depression Inventory-II; PSS = Perceived Stress Scale; CISS = Coping Inventory for Stressful Situations; P-FC = Problem-Focused Coping; E-FC = Emotion-Focused Coping; A-FC = Avoidant-Focused Coping.

($F(2, 43) = 1.79$, $p = 0.179$, $\eta_p^2 = 0.08$) and avoidant-focused coping methods ($F(2, 43) = 0.52$, $p = 0.598$, $\eta_p^2 = 0.02$), there was no significant difference among the three groups (see Table 2). This part of the results indicated that participating in the two exercise programs fail to have a significant effect on changing various cognitive-behavioral strategies of coping methods.

4. Discussion

The aim of this study was to examine the effect of aerobic indoor exercise compared to green exercise on triple categories of affective, cognitive and somatic symptoms of depression and to investigate the role of psychological mediators of perceived stress and coping strategies. Comparison of post-tests of the indoor and green exercise conditions to those of the control condition indicated that adding exercise to pharmacotherapy significantly improved all three categories of affective, cognitive and somatic symptoms of depression in these two groups compared with the control group. This finding is consistent with the results obtained by other studies [4] [5] [7] [8] [45] [46]. The results of some other studies also indicated that exercise can improve the affective, cognitive and somatic symptoms of depression through, for example, increasing the level of serotonin secretion [47], increasing self-esteem [48] and optimizing sleep quality [49], respectively.

Regarding the mediating role of perceived stress level, our findings demonstrated that the rate of stress reduction after interventions was significantly greater in the indoor and green exercise conditions compared with the control condition. This finding suggests that adding exercise to routine pharmacotherapy can significantly improve all the affective, cognitive and somatic symptoms of depression particularly via decreasing the stress rate. According to the kindling-sensitization hypothesis, it is believed that repeated stressful events gradually lead to sensitivity and vulnerability of the brain to stress and subsequent depression attacks [50]. Moreover, some researchers believe that physically more active individuals are not only more resistant and adaptable to the adverse consequences of physical stress, but also to psychosocial stresses of daily living due to reduced physiological reactions [51]. In this regard the findings of a study [52] indicated the positive effect of a 20-week aerobic exercise program in significantly improving the students' emotional reactions to final exam stress.

Based on our findings, in post-intervention measures the rate of reduction in all three categories of affective, cognitive and somatic symptoms of depression and perceived stress was not greater in the green exercise condition compared with the indoor exercise one. This finding is different from the results obtained by other researchers in the field of mental health such as Pretty, Peacock, Sellens, and Griffen [12], Mackay and Neill [13], Mitchel [14] and Ward Thompson *et al.* [15]. This inconsistency could be attributed to several reasons. First, as Pretty *et al.* [53] have reported, other studies mostly used more pleasurable green exercise such as cycling, horse riding, fishing, kayaking and mountain running. However, it seems that performing aerobic exercise in a green space compared

with indoor situation may not produce a double effect on decreasing depression such as the above mentioned activities. Second, in other studies about the effect of exercise on mental health like Mackay and Neill [13] green exercise was usually conducted in a bracing natural environment such asroads, forests and mountains while the exercise used in this study was conducted in an artificial green environment of an urban park. It is possible that performing exercise in an artificial green environment like a park cannot double the rate of improvement of clinical depression as well as performing exercise in a natural green environment such as the above mentioned bracing situations. It is also possible that patients do not perceive the greenness of artificial green environments as much as natural ones and this consequently reduces the potential effect of green exercise in an artificial green environment on depression. Some researchers also pointed out that the amount of health benefits of physical activity is a result of various factors including exercise variables (such as type, duration and intensity), individual differences (such as personality), environmental variables (such as perceived greenness) and socio-cultural variables [13]. Accordingly, as Thompson Coon *et al.* [54] have noted, it should be emphasized that to determine the advantages of the green exercise compared with indoor exercise, there is a need for further experimental studies on clinical populations of both sexes especially depressed patients using a variety of physical activities in various green spaces.

Finally, regarding the use of various stress coping strategies, the results of baseline measurements indicated that the participants of the study mostly used emotion-focused coping methods compared with the other two methods. This is consistent with the findings of other studies including Hori *et al.* [26], Horwitz *et al.* [27] and Sugawara *et al.* [28]. More importantly, based on post intervention scores regarding the use of stress coping strategies we found that performing one program of aerobic indoor or green exercise did not lead to any significant difference in these two groups compared with the control group. This is not consistent with the findings of some studies such as Wijndaele *et al.* [29]. One possible justification for this finding is that for exercise and physical activity to exert its positive effect on the cognitive and behavioral characteristics especially stress coping methods, there is a need for a longer time, perhaps some years, a situation that can be confirmed by cross-sectional or cohort studies such as Wijndaele *et al.* [29]. Some researchers [55] [56] also state that encouraging and training patients to use more effective stress coping strategies is an indispensible component of cognitive-behavioral interventions. Thome and Espelage [57] in a different point of view believe that exercise and physical activity should be considered as a stress coping method independent of other methods. They also believe that some items should be added to the stress coping questionnaires measuring problem-focused, emotion-focused and avoidant-focused methods to assess stress coping via exercise as an independent method.

5. Conclusion

In conclusion, our findings demonstrated that in the clinical settings, both of the

indoor exercise program in a gym and green exercise program in an outdoor green environment of an urban park can help to further improvement of all three categories of affective, cognitive and somatic symptoms of depression as an adjunct (or independent) treatment to the same degree, especially mediated by reducing the amount of perceived stress, but not through any changes in cognitive-behavioral coping strategies.

Acknowledgements

Thanks to the head and personnel of Bahman psychiatric hospital in Yazd, Iran for their support during.

Conflict of Interest

The authors declare that they have no conflict of interest.

References

[1] Kwasky, A.N. and Groh, C.J. (2014) Vitamin D, Depression and Coping Self-Efficacy in Young Women: Longitudinal Study. *Archives of Psychiatric Nursing*, **28**, 362-367. https://doi.org/10.1016/j.apnu.2014.08.010

[2] Rozanski, A. (2012) Exercise as Medical Treatment for Depression. *Journal of the American College of Cardiology*, **60**, 1064-1066. https://doi.org/10.1016/j.jacc.2012.05.015

[3] Danielsson, L., Papoulias, I., Petersson, E.L., Carlsson, J. and Waern, M. (2014) Exercise or Basic Body Awareness Therapy as Add-on Treatment for Major Depression: A Controlled Study. *Journal of Affective Disorders*, **168**, 98-106. https://doi.org/10.1016/j.jad.2014.06.049

[4] Schuch, F.B., Vasconcelos-Moreno, M.P., Borowsky, C., Zimmermann, A.B., Rocha, N.S. and Fleck, M.P. (2015) Exercise and Severe Major Depression: Effect on Symptom Severity and Quality of Life at Discharge in an Inpatient Cohort. *Journal of Psychiatric Research*, **61**, 25-32. https://doi.org/10.1016/j.jpsychires.2014.11.005

[5] Atlantis, E., Chow, C.M., Kirby, A. and Fiatarone, S.M. (2004) An Effective Exercise-Based Intervention for Improving Mental Health and Quality of Life Measures: A Randomized Controlled Trial. *Preventive Medicine*, **39**, 424-434.

[6] Mota-Pereira, J., Silverio, J., Carvalho, S., Ribeiro, J.C., Fonte, D. and Ramos, J. (2011) Moderate Exercise Improves Depression Parameters in Treatment-Resistant Patients with Major Depressive Disorder. *Journal of Psychiatric Research*, **45**, 1005-1011. https://doi.org/10.1016/j.jpsychires.2011.02.005

[7] Schuch, F.B., Vasconcelos-Moreno, M.P., Borowsky, C. and Fleck, M.P. (2011) Exercise and Severe Depression: Preliminary Results of an Add-on Study. *Journal of Affective Disorders*, **133**, 615-618.

[8] van den Berg, A.E. and Custers, M.H.G. (2010) Gardening Promotes Neuroendocrine and Affective Restoration from Stress. *Journal of Health Psychology*, **16**, 3-11. https://doi.org/10.1177/1359105310365577

[9] Dunn, A.L., Trivedi, M.H., Kampert, J.B., Clark, C.G. and Chambliss, H.O. (2002) The DOSE Study: A Clinical Trial to Examine Efficacy and Dose Response of Exercise as Treatment for Depression. *Controlled Clinical Trials*, **23**, 584-603.

[10] De Moor, M.H.M., Boomsma, D.I., Stubbe, J.H., Willemsen, G. and De Geus, E.J.C. (2008) Testing Causality in the Association between Regular Exercise and Symp-

toms of Anxiety and Depression. *Archives of General Psychiatry*, **65**, 897-905.

[11] Kerse, N., Hayman, K.J., Moyes, S.A., Peri, K., Robinson, E., Dowell, A., Kolt, G.S., Elley, C.R., Hatcher, S., Kiata, L., Wiles, J., Keeling, S., Parsons, J. and Arroll, B. (2010) Home-Based Activity Program for Older People with Depressive Symptoms: Dellite-A Randomized Controlled Trial. *Annals of Family Medicine*, **8**, 214-223. https://doi.org/10.1370/afm.1093

[12] Pretty, J., Peacock, J., Sellens, M. and Griffen, M. (2005) The Mental and Physical Health Outcomes of Green Exercise. *International Journal of Environmental Health Research*, **15**, 319-337. https://doi.org/10.1080/09603120500155963

[13] Mackay, G.J. and Neill, J.T. (2010) The Effect of "Green Exercise" on State Anxiety and the Role of Exercise Duration, Intensity, and Greenness: A Quasi-Experimental Study. *Psychology of Sport and Exercise*, **11**, 238-245. https://doi.org/10.1016/j.psychsport.2010.01.002

[14] Mitchel, R. (2013) Is Physical Activity in Natural Environments Better for Mental Health than Physical Activity in Other Environments? *Social Science & Medicine*, **91**, 130-134. https://doi.org/10.1016/j.socscimed.2012.04.012

[15] Ward, T.C., Roe, J., Aspinall, P., Mitchell, R., Clow, A. and Miller, D. (2012) More Green Space Is Linked to Less Stress in Deprived Communities: Evidence from Salivary Cortisol Patterns. *Landscape and Urban Planning*, **105**, 221-229. https://doi.org/10.1016/j.landurbplan.2011.12.015

[16] Ulrich, R.S., Simons, R.F., Losito, B.D., Fiorito, E., Miles, M.A. and Zelson, M. (1991) Stress Recovery during Exposure to Natural and Urban Environments. *Journal of Environmental Psychology*, **11**, 201-230. https://doi.org/10.1016/S0272-4944(05)80184-7

[17] Kaplan, R. (2001) The Nature of the View from Home: Psychological Benefits. *Environment and Behavior*, **33**, 507-542. https://doi.org/10.1177/00139160121973115

[18] Rimmele, U., Seiler, R., Marti, B., Wirtz, P.H., Ehlert, U. and Heinrichs, M. (2009) The Level of Physical Activity Affects Adrenal and Cardiovascular Reactivity to Psychosocial Stress. *Psychoneuroendocrinology*, **34**, 190-198. https://doi.org/10.1016/j.psyneuen.2008.08.023

[19] Lange, C., Zschucke, E., Ising, M., Uhr, M., Bermpohl, F. and Adli, M. (2013) Evidence for a Normal HPA Axis Response to Psychosocial Stress in Patients Remitted from Depression. *Psychoneuroendocrinology*, **38**, 2729-2736. https://doi.org/10.1016/j.psyneuen.2013.06.033

[20] Nabkasorn, C., Miyai, N., Sootmongkol, A., Junprasert, S., Yamamoto, H., Arita, M. and Miyashita, K. (2005) Effects of Physical Exercise on Depression, Neuroendocrine Stress Hormones and Physiological Fitness in Adolescent Females with Depressive Symptoms. *The European Journal of Public Health*, **16**, 179-184. https://doi.org/10.1093/eurpub/cki159

[21] Rimmele, U., Zellweger, B.C., Marti, B., Seiler, R., Mohiyeddini, C., Ehlert, U. and Heinrichs, M. (2007) Trained Men Show Lower Cortisol, Heart Rate and Psychological Responses to Psychosocial Stress Compared with Untrained Men. *Psychoneuroendocrinology*, **32**, 627-635. https://doi.org/10.1016/j.psyneuen.2007.04.005

[22] Klaperski, S., Dawans, B., Heinrichs, M. and Fuchs, R. (2013) Does the Level of Physical Exercise Affect Physiological and Psychological Responses to Psychosocial Stress in Women? *Psychology of Sport and Exercise*, **14**, 266-274. https://doi.org/10.1016/j.psychsport.2012.11.003

[23] Klusmann, V., Evers, A., Schwarzer, R. and Heuser, I. (2012) Views on Aging and Emotional Benefits of Physical Activity: Effects of an Exercise Intervention in Older Women. *Psychology of Sport and Exercise*, **13**, 236-242.

https://doi.org/10.1016/j.psychsport.2011.11.001

[24] Folkman, S. and Lazarus, R.S. (1985) If It Changes It Must Be a Process: Study of Emotion and Coping during Three Stages of a College Examination. *Journal of Personality and Social Psychology*, **48**, 150-170. https://doi.org/10.1037/0022-3514.48.1.150

[25] Endler, N.S. and Parker, J.D.A. (1990) Multidimensional Analysis of Coping: A Critical Evaluation. *Journal of Personality and Social Psychology*, **58**, 844-854. https://doi.org/10.1037/0022-3514.58.5.844

[26] Hori, H., Teraishi, T., Ota, M., Hattori, K., Matsuo, J., Kinoshita, Y., Ishida, I., Nagashima, A., Koga, N., Higuchi, T. and Kunugi, H. (2014) Psychological Coping in Depressed Outpatients: Association with Cortisol Response to the Combined Dexamethasone/CRH Test. *Journal of Affective Disorders*, **152-154**, 441-447. https://doi.org/10.1016/j.jad.2013.10.013

[27] Horwitz, A.G., Hill, R.M. and King, C.A. (2011) Specific Coping Behaviors in Relation to Adolescent Depression and Suicidal Ideation. *Journal of Adolescence*, **34**, 1077-1085. https://doi.org/10.1016/j.adolescence.2010.10.004

[28] Sugawara, N., Yasui-Furukori, N., Sasaki, G., Tanaka, O., Umeda, T., Takahashi, I., Iwane, K., Matsuzaka, M., Kaneko, S. and Nakaji, S. (2012) Coping Behaviors in Relation to Depressive Symptoms and Suicidal Ideation among Middle-Aged Workers in Japan. *Journal of Affective Disorders*, **142**, 264-268. https://doi.org/10.1016/j.jad.2012.05.011

[29] Wijndaele, K., Matton, L., Duvigneaud, N., Lefevre, J., Bourdeaudhuij, I., Duquet, W. and Philippaerts, R.M. (2007) Association between Leisure Time Physical Activity and Stress, Social Support and Coping: A Cluster-Analytical Approach. *Psychology of Sport and Exercise*, **8**, 425-440. https://doi.org/10.1016/j.psychsport.2006.08.001

[30] American Psychiatric Association (2013) Diagnostic and Statistical Manual of Mental Disorders (DSM-V). 5th Edition, American Psychiatric Publishing, Arlington.

[31] Beck, A.T., Steer, R.A. and Brown, G.K. (1996) BDI–II, Beck Depression Inventory: Manual. 2nd Edition, Harcourt Brace, Boston.

[32] Law, R.Y.W. and Herbert, R.D. (2007) Warm-Up Reduces Delayed-Onset Muscle Soreness but Cool-Down Does Not: A Randomised Controlled Trial. *Australian Journal of Physiotherapy*, **53**, 91-95. https://doi.org/10.1016/S0004-9514(07)70041-7

[33] Malliou, P., Rokka, S., Beneka, A., Mavridis, G. and Godolias, G. (2007) Reducing Risk of Injury Due to Warm up and Cool down in Dance Aerobic Instructors. *Journal of Back & Musculoskeletal Rehabilitation*, **20**, 29-35. https://doi.org/10.3233/BMR-2007-20105

[34] American College of Sports Medicine (2000) ACSM's Guidelines for Exercise Testing and Prescription. 6th Edition, Lippincott Williams & Wilkins, Baltimore.

[35] Tanaka, H., Monahan, K.D. and Seals, D.R. (2001) Age-Predicted Maximal Heart Rate Revisited. *Journal of the American College of Cardiology*, **37**, 153-156. https://doi.org/10.1016/S0735-1097(00)01054-8

[36] American College of Sports Medicine (2010) ACSM's Guidelines for Exercise Testing and Prescription. 8th Edition, Wolters Kluwer/Lippincott Williams & Wilkins, Philadelphia.

[37] Wang, Y.P. and Gorenstein, C. (2013) Psychometric Properties of the Beck Depression Inventory-Ii: A Comprehensive Review. *Revista Brasileira de Psiquiatria*, **35**, 416-431. https://doi.org/10.1590/1516-4446-2012-1048

[38] Ghassemzadeh, H., Mojtabai, R., Karamghadiri, N. and Ebrahimkhani, N. (2005)

Psychometric Properties of a Persian-Language Version of the Beck Depression Inventory-Second Edition: BDI-2-Persian, *Depression and Anxiety*, **21**, 185-192. https://doi.org/10.1002/da.20070

[39] Cohen, S., Kamarck, T. and Mermelstein, R.A. (1983) A Global Measure of Perceived Stress. *Journal of Health and Social Behavior*, **24**, 385-396. https://doi.org/10.2307/2136404

[40] Ly, K.H., Carlbring, P. and Andersson, G. (2012) Behavioral Activation-Based Guided Self-Help Treatment Administered through a Smartphone Application: Study Protocol for a Randomized Controlled Trial. *Trials*, **13**, 1-6. https://doi.org/10.1186/1745-6215-13-62

[41] Maroufizadeh, S., Zareiyan, A. and Sigari, N. (2014) Reliability and Validity of Persian Version of Perceived Stress Scale (PSS-10) in Adults with Asthma. *Archives of Iranian Medicine*, **17**, 361-365.

[42] Endler, N.S. and Parker, J.D.A. (1990) Coping Inventory for Stressful Situations (CISS): Manual. Multi-Health Systems, Toronto.

[43] McWilliams, L.A., Cox, B.J. and Enns, M.W. (2003) Use of the Coping Inventory for Stressful Situations in a Clinically Depressed Sample: Factor Structure, Personality Correlates, and Prediction of Distress. *Journal of Clinical Psychology*, **59**, 423-437. https://doi.org/10.1002/jclp.10080

[44] Shokri, O., Taghilou, S., Geravand, F., Paeizi, M., Moulaei Mohammad, A.B.D., Elahpour, M. and Akbari, H. (2008) Factor Structure and Psychometric Properties of the Farsi Version of the Coping Inventory for Stressful Situations (CISS). *Advances in Cognitive Science*, **10**, 22-33.

[45] Barton, J. and Pretty, J. (2010) What Is the Best Dose of Nature and Green Exercise for Improving Mental Health? A Multi-Study Analysis. *Environmental Science and Technology*, **44**, 3947-3955. https://doi.org/10.1021/es903183r

[46] Blumenthal, J.A., Babyak, M.A., Doraiswamy, P.M., Watkins, L., Hoffman, B.M., Barbour, K.A., Herman, S., Craighead, W.E., Brosse, A.L., Waugh, R., Hinderliter, A. and Sherwood, A. (2007) Exercise and Pharmacotherapy in the Treatment of Major Depressive Disorder. *Psychosomatic Medicine*, **69**, 587-596. https://doi.org/10.1097/PSY.0b013e318148c19a

[47] Wipfli, B., Landers, D., Nagoshi, C. and Ringenbach, S. (2011) An Examination of Serotonin and Psychological Variables in the Relationship between Exercise and Mental Health. *Scandinavian Journal of Medicine and Science in Sports*, **21**, 474-481. https://doi.org/10.1111/j.1600-0838.2009.01049.x

[48] Craft, L.L. (2005) Exercise and Clinical Depression: Examining Two Psychological Mechanisms. *Psychology of Sport and Exercise*, **6**, 151-171. https://doi.org/10.1016/j.psychsport.2003.11.003

[49] Rethorst, C.D., Sunderajan, P., Greer, T.L., Grannemann, B.D., Nakonezny, P.A., Carmody, T.J. and Trivedi, M.H. (2013) Does Exercise Improve Self-Reported Sleep Quality in Non-Remitted Major Depressive Disorder? *Psychological Medicine*, **43**, 699-709. https://doi.org/10.1017/S0033291712001675

[50] Bagley, S.L., Weaver, T.L. and Buchanan, T.W. (2011) Sex Differences in Physiological and Affective Responses to Stress in Remitted Depression. *Physiology & Behavior*, **104**, 180-186. https://doi.org/10.1016/j.physbeh.2011.03.004

[51] Zschucke, E., Renneberg, B., Dimeo, F., Wüstenberg, T. and Ströhle, A. (2015) The Stress-Buffering Effect of Acute Exercise: Evidence for HPA Axis Negative Feedback. *Psychoneuroendocrinology*, **51**, 414-425. https://doi.org/10.1016/j.psyneuen.2014.10.019

[52] Haaren, B., Haertel, S., Stumpp, J., Hey, S. and Ebner-Priemer, U. (2015) Reduced

Emotional Stress Reactivity to a Real-Life Academic Examination Stressor in Students Participating in a 20-Week Aerobic Exercise Training: A Randomised Controlled Trial Using Ambulatory Assessment. *Psychology of Sport and Exercise*, **20**, 67-75. https://doi.org/10.1016/j.psychsport.2015.04.004

[53] Pretty, J., Peacock, J., Hine, R., Sellens, M., South, N. and Griffen, M. (2007) Green Exercise in the UK Countryside: Effects on Health and Psychological Well-Being, and Implications for Policy and Planning. *Journal of Environmental Planning and Management*, **50**, 211-231. https://doi.org/10.1080/09640560601156466

[54] Thompson, C.J., Boddy, K., Stein, K., Whear, R., Barton, J. and Depledge, M.H. (2011) Does Participating in Physical Activity in Outdoor Natural Environments Have a Greater Effect on Physical and Mental Wellbeing than Physical Activity Indoors? A Systematic Review. *Environmental Science & Technology*, **45**, 1761-1772. https://doi.org/10.1021/es102947t

[55] Fletcher, K., Parker, G.B. and Manicavasagar, V. (2013) Coping Profiles in Bipolar Disorder. *Comprehensive Psychiatry*, **54**, 1177-1184. https://doi.org/10.1016/j.comppsych.2013.05.011

[56] Nagase, Y., Uchiyama, M., Kaneita, Y., Li, L., Kaji, T., Takahashi, S., Konno, M., Mishima, K., Nishikawa, T. and Ohida, T. (2009) Coping Strategies and Their Correlates with Depression in the Japanese General Population. *Psychiatry Research*, **168**, 57-66. https://doi.org/10.1016/j.psychres.2008.03.024

[57] Thome, J. and Espelage, D.L. (2004) Relations among Exercise, Coping, Disordered Eating, and Psychological Health among College Students. *Eating Behaviors*, **5**, 337-351. https://doi.org/10.1016/j.eatbeh.2004.04.002

Call for Papers

Open Journal of Medical Psychology (OJMP)

ISSN Print: 2165-9370 ISSN Online: 2165-9389
http://www.scirp.org/journal/ojmp

Open Journal of Medical Psychology **(OJMP)** is an international journal dedicated to the latest advancement of Medical Psychology. The goal of this journal is to provide a platform for scientists and academicians all over the world to promote, share, and discuss various new issues and developments in different areas of Medical Psychology.

Editorial Board

Subject Coverage

All manuscripts must be prepared in English, and are subject to a rigorous and fair peer-review process. Accepted papers will immediately appear online followed by printed hard copy. The journal publishes original papers including but not limited to the following fields:

- Clinical Psychology
- Health Psychology
- Patient Psychology
- Other Disciplines of Medical Psychology

We are also interested in: 1) 2-5 page papers where an author can present either preliminary data or an idea with theoretical background but has not yet completed the research needed for a complete paper: 2) Book Reviews—Comments and critiques.

Notes for Intending Authors

Submitted papers should not have been previously published nor be currently under consideration for publication elsewhere. Paper submission will be handled electronically through the website. All papers are refereed through a peer review process. For more details about the submissions, please access the website.

Website and E-Mail

http://www.scirp.org/journal/ojmp **E-mail: ojmp@scirp.org**

What is SCIRP?

Scientific Research Publishing (SCIRP) is one of the largest Open Access journal publishers. It is currently publishing more than 200 open access, online, peer-reviewed journals covering a wide range of academic disciplines. SCIRP serves the worldwide academic communities and contributes to the progress and application of science with its publication.

What is Open Access?

All original research papers published by SCIRP are made freely and permanently accessible online immediately upon publication. To be able to provide open access journals, SCIRP defrays operation costs from authors and subscription charges only for its printed version. Open access publishing allows an immediate, worldwide, barrier-free, open access to the full text of research papers, which is in the best interests of the scientific community.

- High visibility for maximum global exposure with open access publishing model
- Rigorous peer review of research papers
- Prompt faster publication with less cost
- Guaranteed targeted, multidisciplinary audience

Scientific Research Publishing

Website: http://www.scirp.org

Subscription: sub@scirp.org

Advertisement: service@scirp.org