Caspian Journal of Health Research
"Caspian J Health Res"

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Research Paper

# The Effectiveness of Strengths-based Treatments for Impulsivity and Self-control in Female Adolescents With Binge-eating Disorders

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**Citation** Abazar Fard S, Javidan L, Meftahi AR, Dabiri T, Solgi Z. The Effectiveness of Strengths-based Treatments for Impulsivity and Self-control in Female Adolescents With Binge-eating Disorders. Caspian Journal of Health Research. 2023; 8(1):29-36. https://doi.org/10.32598/CJHR.8.1.407.1

**Running Title** Strengths-based Treatments for Impulsivity and Self-control

https://doi.org/10.32598/CJHR.8.1.407.1



## ABSTRACT

**Background:** There are various educational programs based on theoretical frameworks for binge-eating disorders. However, there is no evidence for Strengths-Based approach targeting low inhibitory control and impulsivity of the patients.

**Objectives:** This experimental study explored the effect of a Strengths-Based clinical teaching course on impulsivity and self-control of adolescents with binge-eating disorder.

**Materials & Methods:** The study was a quasi-experimental design with pre-test and post-test evaluations on adolescents with binge-eating disorders in clinical psychology in Kermanshah. A total of 26 adolescents with binge-eating disorders were randomly assigned to the experimental (n=13) and control (n=13) groups. Then, they were asked to fill out a questionnaire about Barrat's impulsivity scale and Tangney's Self-Control Scale. The experimental group was taught methods and techniques of strengths-based strategies for eight 90-minute sessions followed by training sessions of strengths-based skills once a week for 2 months, whereas the control group received no psychological training during this time. After these sessions, both groups were given post-test evaluations. Data were compared using multivariate and univariate analysis of variance.

**Results:** The age range of participants was 14-18 years. The mean post-test score showed that impulsivity was significantly decreased and self-control was significantly increased in the experimental group. The result of univariate analysis of variance indicate that the two groups differed significantly on impulsivity ($F=15.91$, $P=0.001$, $\eta p^2=0.59$) and self-control ($F=17.25$, $P=0.001$, $\eta p^2=0.62$).

**Conclusion:** Using a strength approach offers effective self-control and impulsivity to adolescents with binge-eating disorders.

**Keywords:** Strengths-based, Impulsivity, Self-control, Adolescent, Binge-eating disorder

**Article info:**
**Received:** 07 Agu 2022
**Accepted:** 27 Nov 2022
**Published:** 01 Jan 2023

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Caspian Journal of Health Research

## 1. Introduction

Binge eating disorder (BED) is characterized by recurrent binge-eating episodes, accompanied by experienced loss of control. Obesity is highly prevalent among patients with BED, which is a public health concern. Several neurocognitive deficits in executive functioning, such as inhibitory control and attentional bias, are thought to contribute to BED's etiology and maintenance, as with other eating disorders [1]. Impulsive behavior is typically associated with BED. A major component of impulsivity is not only increased reward sensitivity but also decrease inhibition, and their interaction makes up the syndrome of the eating disorder [2]. According to systematic reviews, most experimental studies, including behavioral and imaging studies, suggest that people with BED have reduced inhibitory control or have a tendency to exhibit rash eating behaviors [3]. In the study by Veit et al., researchers found that eating disorders characterized by bingeing and purging have difficulty managing emotions, including difficulties in controlling impulses, directing behavior, and accessing effective strategies for emotional regulation [1, 2].

A lack of self-control or willpower is primarily believed to be the cause of BED in many adolescents [4]. The degree of loss of control eating is more important to psychological and behavioral outcomes than binge size when comparing individuals who have and do not have objectively large binge episodes [5]. The findings recommend that the trait of self-control is of great importance in regulating psychological discomfort and disinhibited eating during stressful periods and that negative affect might be the main psychological mechanism underlying the relationship between self-control ability and disinhibited eating [6]. As a result of the findings of the study, self-control plays a significant role in regulating psychological discomfort as well as disinhibited eating during stressful periods, and negative affect may play a key role in explaining how self-control is associated with both women and men [6, 7]. A recent study conducted by Li et al. suggests that self-control may play a role in the development of ED, therefore a potential therapeutic strategy targeting it may be beneficial [8]. Furthermore, these findings suggest therapeutic interventions targeting self-control and impulsivity should be considered across these disorders. In previous study cognitive-behavioral therapy (CBT) was shown to reduce the occurrence of ED by improving impulsivity [8]. Interventions aimed at preventing food-related reactions and developing self-control strategies are essential [9].

In this study an alternative approach was used, which aimed to develop strategies based on patient strengths, anticipating that patients with low inhibitory control and impulsivity would benefit from this strategy. A focus was placed on raising students' self-esteem, developing their growth mindset, and helping them accept exceptions throughout the program. Parents and facilitators who find positive praise useful when working with children report that positive praise celebrates the effort more than the result [10]. In strength-based approaches, healing and empowerment are supported by the community, associations, and organizations that people belong to, and by their inherent abilities to support healing and empowerment. As part of a health and well-being approach, people are encouraged to focus on assets that will promote positivity [11]. It has been found that strength-based approaches were efficient in several health conditions such as; improvement retention in substance abuse treatment [12] and helping children with neuropsychiatric disabilities [13], and improving student achievement and wellbeing outcomes [14].

For adolescents with being-eating disorders to develop these qualities, additional training and support are needed regarding clinical assessments, feedback skills, and strategies to moderate impulsivity and self-control [15-18]. Using a strengths-based approach can help individuals manage their health problems by utilizing their strengths, capacities, and resources. Adolescents with eating disorders could benefit from this new program by developing new skills and strengthening their current conditions. Researchers conducted this study to assess how strengths-based treatment could help adolescents with binge-eating control their impulsivity and self-control.

## 2. Materials and Methods

### Study type and population

The current research was an experimental study with a pre-test-post-test control group design. The statistical population comprised all adolescents with binge-eating disorders referring to two clinical psychologies; Vahdat and Golestan in the city of Kermanshah from 2021 to 2022. Based on the result of the previous study with a mean difference of 8 and SD of 2.40, power of 0.8, probability of type I error as 0.05, and attrition rate of 10%. a total of 30 samples were calculated [19], Inclusion criteria were 14-18 years old and a definite diagnosis of BED based on the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition, DSM-5. Exclusion criteria included severe psychiatric disorders such as mood and anxiety disorder and addiction and physical conditions

affecting eating behavior such as changes in drugs for diabetes or thyroid diseases).

## Study procedure

First, the researcher referred to two clinical psychologies; Vahdat and Golestan in the city of Kermanshah from 2021 to 2022. Eligible participants were taken informed consent while parents were informed about the research project. To protect the privacy of children's data, researchers assured them that their data would be kept confidential. Then they were randomly allocated into experimental and control groups. Randomization was performed using 30 sealed envelopes in a box containing the same number of letters A and B. Each participant selected a card and removed it from the box [20]. The participants were asked to fill out a questionnaire about Barrat's impulsivity scale and Tangney's Self-Control Scale. To calculate using weight (kg)/height$^2$ ($m^2$). A BMI of 25.0 kg/$m^2$ or more is considered overweightness, and a healthy BMI ranges from 18.5 to 24.9 kg/$m^2$. An educational program focused on strengths-based abilities was then administered to the experimental group in 8 sessions once a week and lasting for 90 minutes. Table 1 shows the content of strength-based training that was adopted from Saleebey [21]. The control group did not receive psychological training during these two months. Both groups received post-test evaluations following these sessions. Researchers answered participants' questions and alleviated any concerns they may have had throughout the procedure. After completion of the study, an educational technique based on strength was given to the control group as part of the research ethics.

## Questionnaire

**Barrat's impulsivity scale:** This scale developed by Professor Ernst Barrett in 2004 was used to measure impulsivity [22]. This questionnaire has 30 questions including cognitive impulsivity, motor impulsivity, and lack of planning. The items were scored on a 4-point Likert scale from 1 (none) to 4 (very much). The scores of the non-clinical control group are between 50-60. Reliability coefficients were calculated using Cronbach's alpha and re-test methods, which were 0.81 and 0.77, respectively [23]. Cronbach's report for the questionnaire mentioned in the current research is 0.965.

**Tangney's self-control scale (SCS):** The full version of SCS included 36 items. But in this study, a brief version of SCS (BSCS) that was proposed by developers was used. The BSCS contains 13 items on a Likert scale rated from 1 (not at all) to 5 (very much) [24]. The maximum score for the questionnaire is 65 and the minimum is 13. A higher score indicates higher self-control and vice versa. According to Mousavi-moghadam et al. [25], The scale has an alpha coefficient of 0.81 and an intraclass correlation coefficient of 0.88, and a confidence interval (of 0.8–0.93). The scale's internal consistency was 0.76 according to current research.

**Table 1.** Contents of strengths-based protocol sessions

| Sessions | Contents |
|---|---|
| 1 | By focusing on what works, what makes people feel good, and what people care about, a strengths-based approach can be developed. The talents, resources, abilities, capacities, and aspirations of everyone are independent of how easily they express themselves. |
| 2 | A client is the expert in her or his situation: She or he knows what is best for them. A practitioner has theoretical and technical knowledge that can assist others rather than hinder them in their actions. |
| 3 | The focus is on people and their environments, and interventions are designed to address both. |
| 4 | By focusing on individual strengths and abilities, people are able to develop. |
| 5 | It is difficult to predict human behavior because it is complex. Trauma does not necessarily lead to problems for people who have experienced it, even if it is serious. |
| 6 | Intervention is a shared responsibility between practitioners, families, and communities. The basis for intervention planning is a mutual process that uses the available resources. Practitioners must have the ability to discover the strengths of their clients and the environments in which they work. |
| 7 | Attempts are made to assess both the risks and strengths of individuals, families, groups, and communities. |
| 8 | Interventions are not focused on finding the causes of people's problems, nor are labels or stigmatizing terms used. The goal is to understand how people deal with their difficulties in the present. |

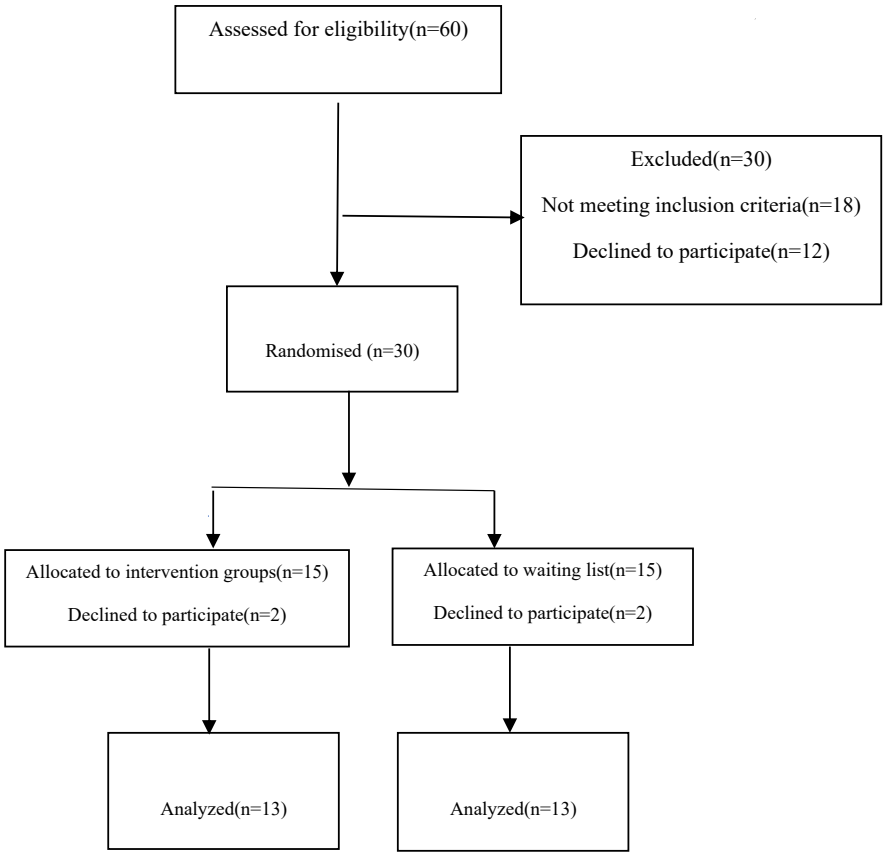


**Figure 1.** Flow diagram of participation in the study
R: Randomised

## Statistical analysis

Data was described in terms of Mean±SD or frequency and percent. Normal distribution was assessed using Kolmogorov-Smirnov's test. Multivariate analysis of variance (MANOVA) was used to assess the effect of an intervention on two dependent variables. Then, univariate analysis of covariance was used to separately assess the effect of an intervention on dependent variables adjusted for baseline values. The variance homogeneity assumption was assessed using Levene's test. The multivariate equality of covariance matrices was evaluated using Box's M. All statistical analysis was performed in SPSS software, version 26.

## 3. Results

Figure 1 shows the flow diagram of participation in the study. Of the 30 eligible participants, 4 individuals declined to continue the study. So the final analysis was performed on 26. The age range of participants was from 14 to 18 years in experimental (Mean±SD 13.43±1.25) and control (Mean±SD 13.39±1.12) groups. The female gender only participated in this study as inclusion criteria. Most individuals were in nine (n=8, 30.8%, and ten (n=12, 46.2%) grades of school. The majority of individuals (86.7%) had BMI between 25 to 29.9. Table 2 shows the pre-test and post-test values of impulsivity and self-control scores for the experimental and control groups. There was no significant difference between the two groups in pre-test values in terms of impulsivity and self-control. The results of the within-group comparison showed impulsivity and self-control had significantly decreased, and the between-group comparison showed impulsivity and self-control had significantly increased.

The homogeneity variance assumption according to Levene's test was met for impulsivity ($F_{1,24}$=0.48, P=0.65) and self-control variables ($F_{1,24}$=0.67, P=0.51). The result of Box's also showed that the assumption of multivariate equality of covariance was met for impulsivity (Box's M=25.2, P=0.17) and self-control variables (Box's M=9.78, P=0.34)

**Table 2.** Results of multivariate analysis of covariance on variables

| Variables | Groups | Mean±SD | | P¥ | F€ | P€ | Eta-squared |
|---|---|---|---|---|---|---|---|
| | | Pre-test | Post-test | | | | |
| Impulsivity Score range (30-120) | Experimental | 61.22±6.91 | 42.67±5.26 | 0.001 | 15.91 | 0.001 | 0.59 |
| | Control | 60.87±6.25 | 59.33±6.37 | 0.314 | | | |
| | P£ | 0.353 | 0.001 | - | | | |
| Self-control Score range (13-65) | Experimental | 43.59±6.21 | 63.34±6.12 | 0.001 | 17.25 | 0.001 | 0.62 |
| | Control | 42.66±5.93 | 44.17±6.25 | 0.287 | | | |
| | P£ | 0.294 | 0.001 | - | | | |

P£ was reported from the Student t-test, P¥ was reported from Paired t-test, € the values were reported from ANCOVA.

The MANOVA results showed that the experimental and control groups have significant differences based on the dependent variables at the level of P<0.001. So, it is possible to conclude that at least one of the dependent variables differs significantly between the two groups. Therefore, two univariate analyzes of covariance were performed. The univariate results indicate that the groups differed significantly on impulsivity (F=15.91, P=0.001, $\eta_p^2$=0.59) and self-control (F=17.25, P=0.001, $\eta_p^2$=0.62).

## 4. Discussion

The current study investigated strength-based strategies to assess impulsivity and self-control in BED patients. According to the results, there is a significant difference between the experimental and control groups in terms of impulsivity and self-control. This study demonstrated that strength-based approaches decreased impulsivity and increased self-control in adolescents with binge-eating disorders.

Strength-based approaches highlight not only people's characteristics but also their environment and the range of contexts that influence their lives. By focusing on the client's competencies and the resources available to them, the approach emphasizes their capabilities. Accordingly, rather than labeling clients, practitioners should use their theoretical and technical knowledge to empower them, including by using their expertise to support them. It is according to this perspective that everyone can live a fulfilling and meaningful life on their terms [21].

Self-control and self-regulation can also be improved through active adolescent engagement involving autonomous goal setting. By the end of the intervention, adolescents in this study reported a higher level of self-control. Self-efficacy is a judgment about the capability to successfully perform a specific task at a given level. The assumption is that when a child succeeds in attaining an important goal, he or she will experience a sense of control that will reinforce self-efficacy and the sense of self. Constructive feedback can strengthen valuable skills and competencies that will reinforce the self-efficacy to handle a certain situation, which, in turn, will stimulate the person to seek new available activities, have less impulsivity, and have more control.

Our findings indicate that a high-fidelity strength-based approach can be successfully implemented in clinical settings and is relevant for healthcare practitioners [26]. Accordingly, Koydemir and Sun-Selçk [27] investigated students' quality of life before and after the intervention, taking into account their psychological and social wellbeing, life satisfaction, psychological happiness, and ontological well-being. During 8 weeks, the intervention group showed a significant improvement in its well-being, while the control group showed no such improvement. Reviewing evidence indicated that using a strength-based approach promotes health outcomes, including reduced hospitalization rates, improved occupational and educational performance, and improved intrapersonal feelings of self-efficacy and hope [26, 28]. Although the intervention produced mixed results, a previous study showed that positive learning interventions based on strengths could lead to improved well-being for students. In addition, the study emphasized the need for evidence regarding the long-term effectiveness of these interventions, whole-school approaches, and theory-building in schools and positive education [29, 30]. Meyers and van Woerkom found that employees' positive

affect and psychological capital are increased following participation in a strength-based intervention [28]. There were also controversial results, for example, Björkman et al. found stronger social networks and symptom scores in the group treated with strength-based case management compared with standard care [31]. Although participants did not gain a deeper understanding of their strengths, this intervention program improved their ability to perform daily at work. In other words, the intervention program is most useful for encouraging participants to maximize their strengths by paying close attention to them [32].

Major conceptual frameworks for personal recovery in mental illness focus on identifying and building upon individual strengths, particularly by providing hope and optimism for change through empowerment and supporting hope and optimism [33]. These results may be better understood by taking a broader perspective, and one explanation may be that for participants to experience significant increases in self-control and decreases in impulsivity, they must be supported in harnessing their strengths development opportunities following the intervention. Participants who reported the greatest improvements in well-being and self-control as well as decreased impulsivity reported better well-being after participating in our intervention program. However, those who demonstrated the greatest increase in strength use also reported an increase in strength use. A major commitment and a significant amount of time may be required to enhance development interventions. Therefore, the possibility of follow-up and knowledge transfer supports the idea that these interventions are most effective when followed up to ensure tangible behavior changes are made. Further studies must be conducted to verify and test this assumption.

## 5. Conclusion

The results of the current study revealed that the strengths-based approach has a favorable effect on the impulsivity and self-control of the participants. The findings of the present study show the possibility of using the new e-health technology to promote impulsivity and self-control in binge-eating adolescents. The study constitutes an important milestone from an applied perspective since it provides positive psychology and human resources professionals with a detailed intervention program that can be replicated, tailored, and implemented across a wide range of health domains. The findings of this study provided innovative information for both researchers and professionals interested in the development of strengths. In terms of theory, it is one of the first studies that fully describes a Strengths-Based approach used to assess impulsivity and self-control in adolescents with binge-eating disorders. Further studies involving follow-up exercises as well as stronger designs (e.g. control groups and multiple measurement points) could be envisioned as the next step in this research.

This study was limited in scope due to a small number of participants, and the self-report nature of measurement, which may have resulted in response bias. In some cases, adolescents with binge-eating disorders might have systematically responded to all items either positively or negatively regardless of the construct being assessed. Third, the sample was obtained from only one Faculty of Behavioral Sciences and Mental Health, Tehran Institute of Psychiatry in Tehran. This may limit the generalizability of the findings for adolescents with binge-eating disorders who attend the Institute s of Psychiatry from other districts or cities.

## Ethical Considerations

### Compliance with ethical guidelines

Informed consent was obtained from children and adolescents Ethical approval was received from the Research Deputy of Payame Noor University (PNU) of the Tehran Research Committee (Code: IR. PNU.REC.400.55). All the participants obtained oral and written information regarding the goals of the work. They were made clear that their engagement was voluntary and all the data will remain confidential.

### Funding

This research did not receive any grant from funding agencies in the public, commercial, or non-profit sectors.

### Authors' contributions

Conceptualization and Supervision: Zahra Solgi and Sabah Abazar Fard; Methodology: Alireza Meftahi; Investigation, writing–original draft, and writing–review & editing: Zahra Solgi, Sabah Abazar Fard, and Lale Javidan; Data collection and analysis: Lale Javidan, Alireza Meftahi and Taraneh Dabiri; Data analysis; Funding acquisition and Resources: Sabah Abazar Fard and Zahra Solgi.

### Conflict of interest

The authors declare no competing interests.

### Acknowledgements

We thank all the individuals and institutions that contributed to the project for their kind corporation.

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