ISSN: 2993-656X

Research Article

International Journal of Endocrinology Research and Reviews

# Obese Adolescents Have Reduced Mentalizing Ability

**Alaleh Taheri[1*], Mohammad Ali Mazaheri[2], Abbas Zabihzadeh[2] and Paul Robinson[3]**

[1]*Department of Clinical Psychology, Iran University of Medical Sciences, Tehran, Iran*

[2]*Department of Psychology, Shahid Beheshti University, Tehran, Iran*

[3]*Division of Medicine, Faculty of Medical Sciences, University College London, London, UK*

**[*]Corresponding Author**
Alaleh Taheri, Department of Clinical Psychology, Iran University of Medical Sciences, Tehran, Iran.

**Submitted**: 2024, Nov 25; **Accepted**: 2024, Dec 24; **Published**: 2025, Jan 07

**Citation:** Taheri, A., Mazaheri, M. A., Zabihzadeh, A., Robinson, P. (2025). Obese Adolescents Have Reduced Mentalizing Ability. *Int J Endo Res & Rev, 5*(1), 01-08.

## Abstract

***Introduction***

*Obesity results from a complex interplay of biological, psychological, and social factors. The psychological dimension may include mentalizing—the ability to understand and interpret one's own and others' mental states. Despite its importance, mentalizing impairments in individuals with obesity have not been specifically investigated. This study aims to explore potential deficits in mentalizing among female adolescents with obesity.*

***Methods***

*This comparative cross-sectional study evaluated the mentalizing abilities of adolescent girls with obesity (n = 120) and their normal-weight peers (n = 91). Participants were carefully screened to exclude those with underweight or overweight conditions. A comprehensive assessment was conducted using the Reflective Functioning Questionnaire (RFQ), the Difficulties in Emotion Regulation Scale (DERS), the Reading the Mind in the Eyes Test (RMET), and the Toronto Alexithymia Scale (TAS).*

***Results***

*Adolescents with obesity exhibited significant impairments in mentalizing, characterized by hypo-mentalizing—a reduced capacity to perceive and interpret mental states—and deficiencies in theory of mind (ToM). They demonstrated higher uncertainty in recognizing mental states, as reflected by elevated RFQ uncertainty scores compared to their normal-weight counterparts. These findings suggest that obese adolescents struggle with emotional self-awareness, interpreting others' mental states, and processing environmental stimuli.*

***Conclusion***

*This study is the first to identify reduced mentalizing abilities in adolescents with obesity, highlighting hypo-mentalizing as a potential psychological trait associated with obesity. These findings underscore the need for further research to confirm this relationship and suggest that addressing mentalizing deficits may be a valuable component of obesity prevention and treatment programs.*

**Keywords:** Adolescents, Obesity, Mentalizing, Hypo-Mentalizing, Reflective Functioning, Emotion Regulation, Theory of Mind

## 1. Introduction

Obesity is a growing global health crisis, with particularly alarming rates among children and adolescents [1,2]. Adolescence is a critical developmental period characterized by increased vulnerability to mental health issues [3]. Obesity during this stage is linked to numerous psychological challenges, including elevated risks of suicidal ideation and attempts [4,5]. Furthermore, adolescence marks a pivotal phase for body image development, where excess body weight often leads to weight-based teasing, body dissatisfaction, and engagement in health-risk behaviors, such as maladaptive eating patterns [6-9]. Adolescents with obesity frequently exhibit maladaptive eating behaviors, including binge

eating, emotional eating, and difficulties in regulating overeating [10-12]. These behaviors may foster an unhealthy dependence on food and are often accompanied by restrictive practices like fasting, laxative misuse, or self-induced vomiting [13,14]. Research suggests that these eating patterns serve as coping mechanisms to manage negative emotions, such as in comfort eating, a key contributor to weight gain [15-19]. Impaired emotional regulation underpins these maladaptive patterns, prompting individuals to adopt ineffective strategies for addressing internal distress or environmental challenges [15,20].

Adolescents with obesity often face neuropsychological vulnerabilities, including lower sensory thresholds, which manifest as patterns of sensory avoidance and sensory sensitivity. These traits complicate their ability to regulate emotions and behaviors, fostering maladaptive eating patterns such as external eating—eating driven by environmental cues rather than internal hunger [21]. Such vulnerabilities underscore the critical need to investigate the psychological mechanisms underlying these behaviors in this population.Mentalization, or reflective functioning (RF), is a promising framework for examining the psychological dimensions of obesity. This ability to interpret and understand one's own and others' mental states is crucial for emotional regulation, self-awareness, and adaptive social interactions [22]. Impairments in mentalization are associated with emotional dysregulation and are hypothesized to contribute to maladaptive eating behaviors [23]. Despite the emphasis on emotional dysregulation in obesity research, interventions focusing solely on emotional regulation have yielded mixed results, suggesting that other psychological mechanisms, such as mentalization, deserve further investigation [24-26].

Obesity shares significant psychological overlap with eating disorders (Eds), including emotional dysregulation, unhealthy weight control behaviors, and insecure attachment styles [27-31]. Insecure attachment, more common among obese individuals, is closely tied to impaired mentalization [30,33,65]. Mentalization helps individuals navigate ambiguity and mental strain, potentially protecting them from both physical symptoms, such as somatization, and psychological conditions, including EDs [31,35]. Mentalizing deficits may also hinder individuals' ability to reflect on their condition and its social or personal impact, further complicating obesity management [36]. Research highlights an unexpectedly high prevalence of EDs and disordered eating behaviors among Iranian adolescents and adults [37]. These findings underscore an urgent need to better understand the mechanisms driving these behaviors and to develop conceptual models and targeted treatments for obesity that address these underlying processes.Although impaired RF has been explored in individuals with Eds, and the mentalizing model is recognized as relevant for understanding ED psychopathology and guiding their treatment [23,38-40]. Little is known about its role in non-eating disordered individuals with obesity.Existing studies suggest that maternal RF impairments increase the likelihood of obesity in children, and limited evidence points to reduced RF in overweight women. However, no research has specifically examined RF deficits in non-ED adolescents with obesity. This study aims to address this critical gap by investigating the mentalizing abilities of non-eating disordered obese adolescent females. By shedding light on the potential role of RF in obesity, this research seeks to advance our understanding of the psychological status of obese adolescents and inform more effective prevention and treatment strategies tailored to this vulnerable population.

## 2. Materials and Methods

### 2.1. Participants & Procedure

This is acomparative cross-sectional study. A total of 380 adolescent girls from 10 single-sex secondary high schools were selected through convenience sampling, and written consent was obtained from each participant and one of their parents.To provide a more accurate measurement, an individual's body mass index (BMI) is typically adjusted for age and sex. The adjusted BMI (adj-BMI) is calculated by determining an individual's BMI and then mapping their height and weight against their age and sex on an appropriate BMI chart [44]. Therefore, the height and weight of each participant were measured, and based on their date of birth, the BMI (weight/height$^2$) was calculated for each individual separately.According to growth reference data approved by WHO [44]. for females aged 15 to 19, a BMI value between the 25th and 75th percentiles is considered within the normal weight (NW) range, while a BMI value in the 95th percentile or above is considered obese (OB) [45,46]. Participants with BMI values falling within the overweight (between the 75th and 95th percentiles) or underweight (below the 25th percentile) categories, as defined by WHO growth reference data, were excluded from the study to ensure methodological accuracy.The remaining participants were divided into two groups: 91 NW adolescent girls (with BMI values between the 25th and 75th percentiles) and 120 adolescent girls with obesity (with BMI values at or above the 95th percentile). The subjects were then provided with the questionnaires. The exclusion criteria included incomplete questionnaires or responses such as "I don't know" or "approximately" to any question.Ethical approval was obtained from the Ethics Committee of Shahid Beheshti University (ID IR.SBU.REC.1399.022.)

## 3. Measures and Instruments

### 3.1. Reflective Functioning Questionnaire (RFQ)

The RFQ is a questionnaire that measures mentalization ability using two subscales: certainty (RFQc) and uncertainty (RFQu), based on a 7-point Likert scale [47]. Certainty is measured by how strongly one opposes propositions. Little agreement with the propositions indicates hyper-mentalization, while frequent agreement suggests a genuine understanding that absolute clarity of mind is impossible. Uncertainty is assessed by the degree to which one agrees with the propositions. A very high score indicates a lack of awareness of internal mental states, while a low score indicates proper mentalization [47,48]. In the Persian version of the questionnaire, Cronbach's alpha for RFQc and RFQu was 0.707 and 0.624, respectively [34]. In the present study, Cronbach's alpha for certainty and uncertainty was 0.661 and 0.668, respectively.

### 3.2. Toronto Alexithymia Scale (TAS)

The TAS is a scale that measures three subscales based on a five-point Likert scale: Difficulty Identifying Feelings (DIF), Difficulty Describing Feelings (DDF), and Externally Oriented Thinking (EOT). In the Persian version of the questionnaire, Cronbach's alpha for overall alexithymia, DIF, DDF, and EOT was reported as 0.85, 0.82, 0.75, and 0.72, respectively [64]. In the present study, Cronbach's alpha for DIF, DDF, and EOT, as well as overall alexithymia, was 0.795, 0.725, 0.616, and 0.823, respectively.

### 3.3. Reading the Mind in the Eyes Test (RMET)

RMET is a psychological test of theory of mind (ToM) in which the respondent must choose the option that best describes the mental state of the person in the picture. In the Persian version of this questionnaire, Cronbach's alpha was reported as 0.72 and in the present study, Cronbach's alpha was 0.641 [49].

### 3.4. Difficulties in Emotional Regulation Scale (DERS)

DERS assesses impairment in emotional regulation based on six subscales: Non-acceptance of Negative Emotions (Non-acceptance), Difficulties Engaging in Goal-Directed Behaviors (Goals), Difficulties Controlling Impulses (Impulse), Lack of Emotional Awareness (Awareness), Lack of Emotional Clarity (Clarity), and Limited Access to Emotion Regulation Strategies (Strategies). In the Persian version, Cronbach's alpha for Non-acceptance ranged from 0.73 to 0.88, Goals from 0.72 to 0.89, Impulse from 0.75 to 0.90, Strategies from 0.76 to 0.85, Awareness from 0.72 to 0.86, Clarity from 0.77 to 0.90, and for overall difficulty, it was reported as 0.79 to 0.92 [63]. In the present study, Cronbach's alpha was 0.848, 0.515, 0.527, 0.699, 0.860, 0.836, and 0.914, respectively.

## 4. Results

The results of the multivariate analysis of variance (MANOVA) test, conducted to ensure that the differences in age and height were not imbalanced, showed no significant differences in height ($F = 0.107$, $p = 0.743$) and age ($F = 3.722$, $p = 0.055$). The mean age of participants in the obese and normal weight (NW) groups was 206.08 months (approximately 17 years and 2 months) and 202.53 months (approximately 16 years and 10 months), respectively. The mean height of participants in the obese and NW groups was 164.20 cm and 164.46 cm, respectively. The mean BMI for the obese and NW groups was 30.03 and 20.89, respectively.Table 1 presents the results for the two groups. Regarding the 12 subscales (DIF, DDF, EOT, Non-acceptance, Goals, Impulse, Awareness, Strategy, Clarity, RFQc, RFQu, and the total score of RMET) and the two-level grouping criteria (obese and NW individuals), the MANOVA was used, and the results are reported below. To assess the homogeneity of the variance-covariance matrix of the research variables, Box's M test was employed. Since the significance level of this test was less than 0.05 (Box's $M = 203.461$, $F = 2.448$, $p = 0.001$), Pillai's trace test was applied. The results of the MANOVA indicated a significant difference between the two groups in terms of the twelve variables ($F = 43.143$, $p < 0.05$, $\eta^2 = 0.723$). Table 2 displays the results of the between-subjects effects test, which determined the differences by the dependent variables.

| Variables | Normal weight | | Obese | |
|---|---|---|---|---|
| | Total (n=91) | | Total (n=120) | |
| | Mean | SD | Mean | SD |
| **TAS** | | | | |
| DIF | 2.42 | 0.49 | 3.62 | 0.61 |
| DDF | 2.75 | 0.80 | 3.39 | 0.66 |
| EOT | 2.61 | 0.65 | 3.31 | 0.62 |
| **DERS** | | | | |
| Non-acceptance | 2.29 | 0.91 | 3.08 | 0.65 |
| Goals | 2.70 | 0.65 | 3.45 | 0.66 |
| Impulse | 2.29 | 0.63 | 2.93 | 0.50 |
| Awareness | 2.49 | 0.59 | 2.89 | 0.62 |
| Clarity | 2.21 | 0.77 | 2.73 | 0.68 |
| Strategies | 2.30 | 0.71 | 3.02 | 0.58 |
| **RFQ** | | | | |
| RFQc | 1.15 | 0.65 | 0.74 | 0.50 |
| RFQu | 0.54 | 0.39 | 1.03 | 0.53 |
| **RMET** | 0.62 | 0.09 | 0.44 | 0.11 |

**Table 1: Descriptive Statistics of Research Variables for Obese and Normal Weight Groups**

*TAS, Toronto alexithymia scale; DERS, difficulties in emotional regulation; DIF, difficulty identifying feelings; DDF, difficulty describing feelings; EOT, externally oriented thinking; RFQ, reflective functioning questionnaire; RFQc, certainty; RFQu, uncertainty; RMET, reading the mind in the eyes test.*

| | Source | Sum of squares (SS) | df | Mean square (MS) | F | p | $\eta^2$ |
|---|---|---|---|---|---|---|---|
| **Group** | DIF | 74.264 | 1 | 74.264 | 233.432 | 0.001 | 0.528 |
| | DDF | 21.164 | 1 | 21.164 | 40.775 | 0.001 | 0.163 |
| | EOT | 25.725 | 1 | 25.725 | 64.192 | 0.001 | 0.235 |
| | Non-Acceptance | 32.624 | 1 | 32.624 | 54.575 | 0.001 | 0.207 |
| | Goals | 29.456 | 1 | 29.456 | 67.855 | 0.001 | 0.245 |
| | Impulse | 21.218 | 1 | 21.218 | 68.18 | 0.001 | 0.246 |
| | Awareness | 8.05 | 1 | 8.05 | 21.743 | 0.001 | 0.094 |
| | Strategy | 26.826 | 1 | 26.826 | 65.754 | 0.001 | 0.239 |
| | Clarity | 14.359 | 1 | 14.359 | 27.608 | 0.001 | 0.117 |
| | RFQc | 8.717 | 1 | 8.717 | 26.761 | 0.001 | 0.114 |
| | RFQu | 12.484 | 1 | 12.484 | 55.18 | 0.001 | 0.209 |
| | RMET | 1.596 | 1 | 1.596 | 153.209 | 0.001 | 0.423 |
| **Error** | DIF | 66.491 | 209 | 0.318 | | | |
| | DDF | 108.481 | 209 | 0.519 | | | |
| | EOT | 83.756 | 209 | 0.401 | | | |
| | Non-Acceptance | 124.935 | 209 | 0.598 | | | |
| | Goals | 90.729 | 209 | 0.434 | | | |
| | Impulse | 65.041 | 209 | 0.311 | | | |
| | Awareness | 77.377 | 209 | 0.37 | | | |
| | Strategy | 85.268 | 209 | 0.408 | | | |
| | Clarity | 108.703 | 209 | 0.52 | | | |
| | RFQc | 68.079 | 209 | 0.326 | | | |
| | RFQu | 47.285 | 209 | 0.226 | | | |
| | RMET | 2.177 | 209 | 0.01 | | | |

**Table 2: Tests of Between-Subjects Effects on the Scores of DIF, DDF, EOT, Non-acceptance, Goals, Impulse, Awareness, Strategy, Clarity, RFQc, RFQu, and the Total RMET Score Between Obese and Normal Weight Groups**

*TAS, Toronto alexithymia scale; DERS, difficulties in emotional regulation; DIF, difficulty identifying feelings; DDF, difficulty describing feelings; EOT, externally oriented thinking; RFQ, reflective functioning questionnaire; RFQc, certainty; RFQu, uncertainty; RMET, reading the mind in the eyes test.*

RFQc, which measures confidence in judging one's own and others' mental states, was lower in the obese group than in the NW group (0.74 vs 1.15). In contrast, RFQu, which reflects difficulty in perceiving complex internal mental state patterns, was higher in the obese group (1.03 vs 0.54).The obese group showed significantly higher mean scores than the NW group on all three subscales of the TAS, indicating greater difficulty in identifying emotions (DDF), expressing emotions (DIF), and reflecting on emotional experiences (EOT).In terms of Theory of Mind (ToM), the obese group scored lower on the RMET than the NW group, suggesting an impairment in perceiving emotional states.The obese group also exhibited more difficulty in all subscales of DERS compared to the NW group. Specifically, the subscale on Goals, which relates to difficulties in sustaining attention and mentalization as well as the subscales for Emotional Awareness, Clarity, and Non-acceptance, align with findings from the alexithymia and reflective functioning measures.

## 5. Discussion

The aim of this study was to compare the mentalizing abilities of non-ED obese adolescent girls with those of normal weight (NW) controls, to explore potential mentalizing impairments in adolescents with obesity. The results indicate that obese adolescents exhibit significantly poorer mentalizing abilities compared to their NW peers. These findings are consistent with prior studies which highlight the difficulties that individuals with obesity experience when reflecting on their condition [36]. A similar pattern of impaired reflective RF in overweight women has been reported in previous research by Maxwelll et al. (2017), further supporting the current results.The lower certainty and higher uncertainty observed in the obese group suggest that individuals with obesity tend to interpret reality more through physical experiences than considering the complexity of mental states. This tendency may contribute to the increased somatization observed in individuals with obesity [36]. Moreover, individuals with obesity often prioritize external cues, such as the appearance of food, over internal cues like hunger [51]. which further points to a lack of self-reflection on their internal states. Our study reveals that individuals with obesity are more prone to hypo-mentalizing—characterized by a reduced ability to perceive mental states and insufficient use of theory of mind

(ToM). This is evidenced by the higher uncertainty scores in the obese group compared to their NW peers. Hypo-mentalizing is marked by difficulties in interpreting mental states, whereas individuals with high certainty scores are typically prone to hyper-mentalizing, where they over-interpret mental states and apply excessive ToM [48]. In contrast, the elevated uncertainty scores in the obese group suggest a deficiency in mentalizing abilities, leading to an underestimation of others' and their own mental states.Higher mean scores in the obese group on all subscales of the Toronto Alexithymia Scale (TAS) align with previous studies and reinforce the well-established association between alexithymia and eating disorders (EDs) [15,52,66]. Alexithymia is negatively correlated with certainty and positively correlated with uncertainty which corresponds with the findings of the present study [54,32].

The difficulty in ToM (emotion perception) observed in the obese group, compared to their NW peers, indicates a challenge in understanding others' mental states and external cues. This difficulty may arise from misinterpreting nonverbal cues, such as facial expressions and body language, which are essential for effective social interaction. Limited ability to identify both internal and external stimuli can adversely affect social adjustment. On the other hand, mentalizing enables individuals to navigate social challenges by understanding their own and others' mental states. Effective mentalization is essential for forming and maintaining healthy social relationships, and dysfunction in this area may negatively impact social adjustment [55]. Poor social adjustment can lead to emotional distress, which, in turn, affects mentalizing abilities [53]. One study reported that impairments in ToM and emotion recognition in obese patients are comparable to those in obese patients with binge eating disorder suggesting that these impairments are not solely attributable to Binge Eating Disorder (BED) [57]. Additionally, difficulties in emotional regulation contribute to emotional overeating and the developmentof obesity [20]. In our study, the obese group demonstrated greater emotional regulation difficulties. The DERS subscales, which assess emotional regulation, have been shown to correlate with eating behaviors [58]. Impaired mentalizing may exacerbate emotional regulation difficulties, which is consistent with findings from Sharp et al. who demonstrated an association between mentalizing and emotional regulation difficulties.In conclusion, impaired mentalization may serve as a risk factor for obesity. However, further research is needed to explore additional components of mentalization and their potential impact on the development and persistence of obesity.

## 6. Conclusion

This study is the first to specifically compare mentalization abilities between adolescents with obesity and their normal-weight peers. While previous research has primarily focused on RF in individuals with obesity who also experience EDs or in overweight populations, the non-ED obese demographic has been largely overlooked. Our findings suggest that impaired mentalization may serve as a risk factor, a contributing element to the persistence of obesity, or a consequence of the condition itself. Further research is needed to determine the causal relationships among these factors. Given the link between impaired mentalization and emotional regulation difficulties, both of which are central to Mentalization-Based Therapy (MBT) we propose that MBT could serve as a valuable adjunctive treatment for individuals with obesity [40]. By enhancing their ability to understand and manage their own and others' mental states, MBT could support healthier eating behaviors and improve emotional regulation, ultimately aiding weight management.This study also underscores the broader psychosocial challenges faced by adolescents with obesity [59,60]. Impaired mentalizing not only affects their internal emotional world but may also hinder their social adjustment and relationships [61,62]. Since mentalizing is essential for interpreting nonverbal cues and fostering successful social interactions, therapeutic strategies targeting mentalization could potentially enhance both psychological well-being and social functioning in this population.

### *Study Limitations and Future Directions*

Despite its novel contributions, this study has several limitations. First, the cultural context of the study was limited to a single country, which may affect the generalizability of the findings. Cross-cultural studies are needed to determine whether the observed relationships hold true across diverse populations. Second, the study focused exclusively on psychological factors, without accounting for potential genetic, hormonal, or neurobiological influences that may also impact mentalization and obesity.Third, this study included only female participants. While this decision allowed for a focused exploration of mentalization in adolescent girls, it limits the generalizability of the findings to males. Importantly, our study did not aim to explore whether gender plays a role in the relationship between mentalization and obesity. As a result, we cannot draw any conclusions regarding gender's potential influence in this context. Future research should investigate whether and how gender may affect the interplay between mentalization and obesity, providing a more comprehensive understanding of this relationship.The concept of the "opaque mind" highlights the inherent fallibility of mentalization, even among highly skilled [56]. Nonetheless, our findings indicate that adolescent girls with obesity exhibit significantly impaired mentalizing abilities compared to their NW counterparts. Replicating these results in larger, more diverse samples will be crucial to confirming these observations.

### *Implications for Prevention and Treatment*

These findings have important implications for understanding the etiology, prevention, and treatment of obesity. Impaired mentalization could be a key psychological factor influencing maladaptive eating behaviors and emotional dysregulation, both of which are associated with obesity. Addressing these deficits through targeted interventions, such as MBT, could reduce the psychological barriers to effective weight management and foster improved social and emotional functioning.Additionally, these findings shed light on the potential social challenges faced by individuals with obesity, who may struggle with interpreting others' intentions and emotions, leading to difficulties in social adjustment. Enhancing mentalization skills could help mitigate these challenges, promoting better social integration and quality of life.Future studies should explore the mechanisms linking impaired

mentalization to eating behaviors, emotional dysregulation, and psychosocial difficulties. A deeper understanding of these relationships will pave the way for innovative, evidence-based strategies to address the complex interplay of psychological factors in obesity.

## Data Availability Statement

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.


## Competing Interests and Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.


## Statements and Declarations

The authors declared no conflicts of interest with respect to the research, authorship, and/or publication of this article.

## Consent to Participate

Written informed consent was obtained from all individual participants included in the study and one of their parents.

## References


1. Gad, N., Elbatanony, M., Mirghani, H., Sheikh, M., Alamri, M., Ali, A., ... &AlHarby, L. (2023). Prevalence of Obesity in Female Schoolchildren, Risk Factors, and Relation to Lifestylein Tabuk, Saudi Arabia. *Pharmacophore, 14*(2-2023), 89-96.
2. Kokka, I., Mourikis, I., &Bacopoulou, F. (2023). Psychiatric disorders and obesity in childhood and adolescence—a systematic review of cross-sectional studies. *Children, 10*(2), 285.
3. Both, L. M., Benetti, S. P. D. C., & Goodman, G. (2019). Reflective function and identity in adolescents with clinical and nonclinical symptoms. *Trends in Psychiatry and Psychotherapy, 41*(2), 176-185.
4. Iwatate, E., Atem, F. D., Jones, E. C., Hughes, J. L., Yokoo, T., & Messiah, S. E. (2023). Association of obesity, suicide behaviors, and psychosocial wellness among adolescents in the United States. *Journal of Adolescent Health, 72*(4), 526-534.
5. Mannan, M., Mamun, A., Doi, S., &Clavarino, A. (2016). Prospective associations between depression and obesity for adolescent males and females-a systematic review and meta-analysis of longitudinal studies. *PloS one, 11*(6), e0157240.
6. Bodega, P., de Cos-Gandoy, A., Fernández-Alvira, J. M., Fernández-Jiménez, R., Moreno, L. A., & Santos-Beneit, G. (2024). Body image and dietary habits in adolescents: a systematic review. *Nutrition reviews, 82*(1), 104-127.
7. Hosseini, S. A., &Padhy, R. K. (2023). Body Image Distortion (Archived). *StatPearls. Treasure Island (FL): StatPearls Publishing.*
8. Pearlman, A. T., Schvey, N. A., Higgins Neyland, M. K., Solomon, S., Hennigan, K., Schindler, R., ... &Tanofsky-Kraff, M. (2020). Associations between family weight-based teasing, eating pathology, and psychosocial functioning among adolescent military dependents. *International journal of environmental research and public health, 17*(1), 24.
9. Tan, Y., Lu, W., Gu, W., Yu, Z., & Zhu, J. (2022). Body weight, weight self-perception, weight teasing and their association with health behaviors among Chinese adolescents—the shanghai youth health behavior survey. *Nutrients, 14*(14), 2931.
10. Tonelli, H., & de Siqueira Rotenberg, L. (2021). Emotion perception and theory of mind in obesity: a systematic review on the impact of social cognitive deficits on dysfunctional eating behaviors. *Surgery for Obesity and Related Diseases, 17*(3), 618-629.
11. Wiedemann, A. A., Ivezaj, V., & Barnes, R. D. (2018). Characterizing emotional overeating among patients with and without binge-eating disorder in primary care. *General hospital psychiatry, 55*, 38-43.
12. Vander Wal, J. S. (2012). Unhealthy weight control behaviors among adolescents. *Journal of health psychology, 17*(1), 110-120.
13. Harrison, A. N., James Bateman, C. C., Younger-Coleman, N. O., Williams, M. C., Rocke, K. D., Clato-Day Scarlett, S. C., & Chang, S. M. (2020). Disordered eating behaviours and attitudes among adolescents in a middle-income country. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity, 25*, 1727-1737.
14. Rankin, J., Matthews, L., Cobley, S., Han, A., Sanders, R., Wiltshire, H. D., & Baker, J. S. (2016). Psychological consequences of childhood obesity: psychiatric comorbidity and prevention. *Adolescent health, medicine and therapeutics*, 125-146.
15. Casagrande, M., Boncompagni, I., Forte, G., Guarino, A., &Favieri, F. (2020). Emotion and overeating behavior: Effects of alexithymia and emotional regulation on overweight and obesity. Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity, 25, 1333-1345.
16. Willem, C., Gandolphe, M. C., Roussel, M., Verkindt, H., Pattou, F., &Nandrino, J. L. (2019). Difficulties in emotion regulation and deficits in interoceptive awareness in moderate and severe obesity. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity, 24*, 633-644.
17. Shriver, L. H., Dollar, J. M., Calkins, S. D., Keane, S. P., Shanahan, L., & Wideman, L. (2020). Emotional eating in adolescence: effects of emotion regulation, weight status and negative body image. *Nutrients, 13*(1), 79.
18. Van Strien, T. (2018). Causes of emotional eating and matched treatment of obesity. Current diabetes reports, 18, 1-8.
19. Christensen, B. J., Iepsen, E. W., Lundgren, J., Holm, L., Madsbad, S., Holst, J. J., &Torekov, S. S. (2018). Instrumentalization of eating improves weight loss maintenance in obesity. *Obesity facts, 10*(6), 633-647.
20. Gianini, L. M., White, M. A., &Masheb, R. M. (2013). Eating pathology, emotion regulation, and emotional overeating in obese adults with binge eating disorder. *Eating behaviors, 14*(3), 309-313.
21. Taheri, A., Mazaheri, M. A., &Zabihzadeh, A. (2022).

Psychopathological Explanation of Obesity in Adolescent Girls on the basis of Sensory Processing Patterns
22. Cate, R., Khademi, M., Judd, P., & Miller, H. (2013). Deficits in mentalization: a risk factor for future development of eating disorders among pre-adolescent girls. *Advances in Eating Disorders: Theory, Research and Practice, 1*(3), 187-194.
23. Robinson, P., Skårderud, F., &Sommerfeldt, B. (2018). *Mentalization-based treatments for eating disorders*. Springer.
24. Yilmaz Kafali, H., Uçaktürk, S. A., Mengen, E., Akpinar, S., ErguvenDemirtas, M., &Uneri, O. S. (2021). Emotion dysregulation and pediatric obesity: investigating the role of Internet addiction and eating behaviors on this relationship in an adolescent sample. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity, 26*, 1767-1779.
25. Görlach, M. G., Kohlmann, S., Shedden-Mora, M., Rief, W., & Westermann, S. (2016). Expressive suppression of emotions and overeating in individuals with overweight and obesity. *European Eating Disorders Review, 24*(5), 377-382.
26. Leehr, E. J., Krohmer, K., Schag, K., Dresler, T., Zipfel, S., & Giel, K. E. (2015). Emotion regulation model in binge eating disorder and obesity-a systematic review. *Neuroscience & Biobehavioral Reviews, 49*, 125-134.
27. Wade, T. (2017). *Encyclopedia of feeding and eating disorders*. Springer Nature.
28. Fagundo, A. B., De la Torre, R., Jiménez-Murcia, S., Agüera, Z., Granero, R., Tárrega, S., ... & Fernández-Aranda, F. (2012). Executive functions profile in extreme eating/weight conditions: from anorexia nervosa to obesity.
29. Villarejo, C., Fernández-Aranda, F., Jiménez-Murcia, S., Peñas-Lledó, E., Granero, R., Penelo, E., ... &Menchón, J. M. (2012). Lifetime obesity in patients with eating disorders: increasing prevalence, clinical and personality correlates. *European Eating Disorders Review, 20*(3), 250-254.
30. Fonagy, P., Luyten, P., & Strathearn, L. (2011). Borderline personality disorder, mentalization, and the neurobiology of attachment. *Infant mental health journal, 32*(1), 47-69.
31. Gambin, M., Woźniak-Prus, M., Konecka, A., & Sharp, C. (2021). Relations between attachment to mother and father, mentalizing abilities and emotion regulation in adolescents. *European Journal of Developmental Psychology, 18*(1), 18-37.
32. Morandotti, N., Brondino, N., Merelli, A., Boldrini, A., De Vidovich, G. Z., Ricciardo, S., ... &Luyten, P. (2018). The Italian version of the Reflective Functioning Questionnaire: Validity data for adults and its association with severity of borderline personality disorder. *PloS one, 13*(11), e0206433.
33. Faber, A., Dube, L., &Knaeuper, B. (2018). Attachment and eating: A meta-analytic review of the relevance of attachment for unhealthy and healthy eating behaviors in the general population. *Appetite, 123*, 410-438.
34. Seyed Mousavi, P. S., Vahidi, E., Ghanbari, S., Khoshroo, S., &Sakkaki, S. Z. (2021). Reflective Functioning Questionnaire (RFQ): Psychometric properties of the Persian translation and exploration of its mediating role in the relationship between attachment to parents and internalizing and externalizing problems in adolescents. *Journal of Infant, Child, and Adolescent Psychotherapy, 20*(3), 313-330.
35. Luyten, P., Van Houdenhove, B., Lemma, A., Target, M., &Fonagy, P. (2012). A mentalization-based approach to the understanding and treatment of functional somatic disorders. *Psychoanalytic Psychotherapy, 26*(2), 121-140.
36. Tambelli, R., Cerniglia, L., Cimino, S., Ballarotto, G., Paciello, M., Lubrano, C., ... &Lenzi, A. (2017). An exploratory study on the influence of psychopathological risk and impulsivity on BMI and perceived quality of life in obese patients. *Nutrients, 9*(5), 431.
37. Taheri, A., Mazaheri, M. A., & Moradi, P. (2023). *Eating Disorders in the Middle East: Iran. In Eating Disorders: An International Comprehensive View* (pp. 1-23). Cham: Springer International Publishing.
38. Simonsen, C. B., Jakobsen, A. G., Grøntved, S., &KjaersdamTelléus, G. (2020). The mentalization profile in patients with eating disorders: a systematic review and meta-analysis. *Nordic Journal of Psychiatry, 74*(5), 311-322.
39. Malda-Castillo, J., Browne, C., & Perez-Algorta, G. (2019). Mentalization-based treatment and its evidence-base status: A systematic literature review. *Psychology and Psychotherapy: theory, research and practice, 92*(4), 465-498.
40. Robinson, P., Hellier, J., Barrett, B., Barzdaitiene, D., Bateman, A., Bogaardt, A., ... &Fonagy, P. (2016). The NOURISHED randomised controlled trial comparing mentalisation-based treatment for eating disorders (MBT-ED) with specialist supportive clinical management (SSCM-ED) for patients with eating disorders and symptoms of borderline personality disorder. *Trials, 17*, 1-15.
41. Wilkinson, L. L., Rowe, A. C., & Millings, A. (2020). Disorganized attachment predicts body mass index via uncontrolled eating. *International Journal of Obesity, 44*(2), 438-446.
42. de Campora, G., Giromini, L., Guerriero, V., Chiodo, C., Zavattini, G. C., &Larciprete, G. (2019). Influence of maternal reflective functioning on mothers' and children's weight: A follow-up study. *Infant mental health journal, 40*(6), 862-873.
43. Pazzagli, C., Germani, A., Buratta, L., Luyten, P., &Mazzeschi, C. (2019). Childhood obesity and parental reflective functioning: Is there a relation?. *International Journal of Clinical and Health Psychology, 19*(3), 209-217.
44. BMI for age GIRLS (2007) World Health Organization https://www.who.int/docs/default-source/child-growth/growth-reference-5-19-years/bmi-for-age-(5-19-years)/bmifa-girls-5-19years-per.pdf?sfvrsn=b762eb2f_4. Accessed 07 Dec 2024.
45. Defining children obesity (2018) Centers for Disease Control and Prevention https://www.cdc.gov/obesity/childhood/defining.html. Accessed 07 Dec 2024.
46. Overweight and obesity statistics (2017) National institute of diabetes and digestive and kidney diseases https://www.niddk.nih.gov/health-information/health-statistics/overweight-obesity. Accessed 07 Dec 2024.
47. Cucchi, A., Hampton, J. A., & Moulton-Perkins, A. (2018). Using the validated Reflective Functioning Questionnaire to investigate mentalizing in individuals presenting with eating disorders with and without self-harm. *PeerJ, 6*, e5756.

48. Sharp, C., &Vanwoerden, S. (2015). Hypermentalizing in borderline personality disorder: A model and data. *Journal of Infant, Child, and Adolescent Psychotherapy, 14*(1), 33-45.
49. Nejati, V., Zabihzadeh, A., Maleki, G. H., &Mohseni, M. (2013). Social cognition in patients with major depression disorder: evidence from reading mind in the eyes test.
50. Poznyak, E., Morosan, L., Perroud, N., Speranza, M., Badoud, D., &Debbané, M. (2019). Roles of age, gender and psychological difficulties in adolescent mentalizing. *Journal of adolescence, 74,* 120-129.
51. Braden, A., Rhee, K., Peterson, C. B., Rydell, S. A., Zucker, N., &Boutelle, K. (2014). Associations between child emotional eating and general parenting style, feeding practices, and parent psychopathology. *Appetite, 80*, 35-40.
52. Fanton, S., Azevedo, L. C., & Vargas, D. M. (2022). Alexithymia in obese adolescents is associated with severe obesity and binge eating behavior. *Jornal de pediatría, 98*, 264-269.
53. Luyten, P., Campbell, C., Allison, E., &Fonagy, P. (2020). The mentalizing approach to psychopathology: State of the art and future directions. *Annual review of clinical psychology, 16*(1), 297-325.
54. Badoud, D., Luyten, P., Fonseca-Pedrero, E., Eliez, S., Fonagy, P., &Debbané, M. (2015). The French version of the Reflective Functioning Questionnaire: Validity data for adolescents and adults and its association with non-suicidal self-injury. *PloS one, 10*(12), e0145892.
55. Bateman, A., O'Connell, J., Lorenzini, N., Gardner, T., &Fonagy, P. (2016). A randomised controlled trial of mentalization-based treatment versus structured clinical management for patients with comorbid borderline personality disorder and antisocial personality disorder. *BMC psychiatry, 16*, 1-11.
56. Jain, F. A., &Fonagy, P. (2020). Mentalizing imagery therapy: theory and case series of imagery and mindfulness techniques to understand self and others. *Mindfulness, 11*(1), 153-165.
57. Aloi, M., Rania, M., Caroleo, M., De Fazio, P., & Segura-García, C. (2017). Social cognition and emotional functioning in patients with binge eating disorder. *European Eating Disorders Review, 25*(3), 172-178.
58. Cooper, J. L., O'Shea, A. E., Atkinson, M. J., & Wade, T. D. (2014). Examination of the difficulties in emotion regulation scale and its relation to disordered eating in a young female sample. *International Journal of Eating Disorders, 47*(6), 630-639.
59. Drosopoulou, G., Sergentanis, T. N., Mastorakos, G., Vlachopapadopoulou, E., Michalacos, S., Tzavara, C., ... &Tsitsika, A. (2021). Psychosocial health of adolescents in relation to underweight, overweight/obese status: The EU NET ADB survey. *European Journal of Public Health, 31*(2), 379-384.
60. Ozoalor, O. N., Ikefuna, A. N., Aronu, A. E., &Ojinnaka, N. C. (2022). Prevalence, Pattern and Sociodemographic Correlates of Psychosocial Disorders in Obese Adolescents in Enugu, Nigeria. *International Journal of Medicine and Health Development, 27*(3), 292-299.
61. Volkert, J., Ilagan, G. S., Iliakis, E. A., Ren, B., Schröder-Pfeifer, P., & Choi-Kain, L. W. (2024). What predicts psychosocial functioning in borderline personality disorder? Investigating the association with reflective functioning. *Psychology and Psychotherapy: Theory, Research and Practice*.
62. Chelouche-Dwek, G., &Fonagy, P. (2024). Mentalization-based interventions in schools for enhancing socio-emotional competencies and positive behaviour: a systematic review. *European Child & Adolescent Psychiatry*, 1-21.
63. Besharat, M. A. (2019). Difficulties in Emotion Regulation Scale. *Thought & Behavior in Clinical Psychology, 13*(47), 89-92.
64. Besharat, M. A. (2007). Reliability and factorial validity of a Farsi version of the 20-item Toronto Alexithymia Scale with a sample of Iranian students. *Psychological reports, 101*(1), 209-220.
65. Redondo, I., &Luyten, P. (2018). The mediating role of mentalizing between attachment and eating disorders. *Bulletin Of The Menninger Clinic, 82*(3), 202-223.
66. Redondo, I., &Luyten, P. (2021). Alexithymia mediates the relationship between insecure attachment and eating disorder symptoms. *Journal of Rational-Emotive & Cognitive-Behavior Therapy, 39*, 491-508.
67. Maxwell, H., Tasca, G. A., Grenon, R., Faye, M., Ritchie, K., Bissada, H., & Balfour, L. (2017). The role of coherence of mind and reflective functioning in understanding binge-eating disorder and co-morbid overweight. *Attachment & human development, 19*(4), 407-424.