Can Informants Report Aid in Diagnosis of Eating Disorders? A study proposal

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This study was designed to test a novel observer-report measurement for eating disorders and measure the discrepancies between this measurement and self-reported data in adolescents with anorexia nervosa and bulimia nervosa. Three groups of participants will be recruited to complete the Disordered Eating Behavior Checklist. The self-reported and informant data will then be compared to check for agreement. Based on previous studies, I hypothesize that there will be significant discrepancies between adolescents and informants in the sub-clinical and clinical group due to feelings of shame and embarrassment. For the healthy group, I would expect a high level of agreement between informant and self-reported data. The results of this study may implicate that it is important for clinicians to not solely rely on self-reported data but to also question multiple informants when assessing an eating disorder. Future studies should also obtain a more representative sample.

Introduction

Eating disorders are complex psychiatric illnesses, affecting both a person's physiological and physical state. The prevalence of eating disorders has been increasing since the last century, and an increasingly high number of individuals, especially females, are diagnosed with eating disorders at some point in their lifetime[1]. It is currently one of the mental illnesses with the highest mortality rate, and an estimated 3.3 million healthy life years worldwide are lost because of eating disorders[2]. The prevalence rates and impairment suggest that studying eating disorders is important.

The two most common types of eating disorders are anorexia nervosa (AN) and bulimia nervosa (BN). According to the Diagnostic and statistical Manual of Mental Disorders (DSM-5), to be diagnosed with anorexia nervosa, the individual must display a restriction of energy intake, leading to low body weight, intense fear of gaining weight or being fat despite being underweight and disturbed by one's body weight or shape, self-worth influenced by body weight or shape, or denial or low bodyweight. To be diagnosed with Bulimia nervosa, the individual must experience recurrent episodes of binge eating, recurrent inappropriate compensatory behavior such as use of laxatives, purging or excessive exercise, binge eating, and inappropriate behavior occurring at least twice a week for three months. Self-evaluation is unjustifiably influenced by body shape and weight[3].

There are multiple steps for assessing eating disorders. Initial assessment of eating disorders includes medical evaluations such as body weight measurement, blood test and body scans. This assessment is then followed by questionnaires and interview methods. The most commonly used tool for eating disorder assessment is the Eating Disorder Examination (EDE)[4,5] and Eating disorder examination questionnaire (EDE-Q)[4,5]. For younger children, clinicians may also utilize a parent report to gain a valid picture of the current psychopathological symptoms of the patients.[6]

The EDE is a standardized instrument to assess the psychopathology of eating disorders. It is a 62-item semi-structured interview that is administered by clinicians. The questions are rated on a 7-point scale in terms of the severity and frequency of symptoms. The interview takes between 30 minutes to 1 hour to complete.[7]

The main benefit of the EDE is that it is more useful and precise than self -reported measures such as the EDE-Q and The Anorexia Nervosa Inventory for self-rating.[8] Semi-structured interviews give the flexibility to ask clarifying questions. Moreover, the interrater reliability is considered to be relatively high, demonstrating that once clinicians have gone through training, a satisfactory level of agreement can be obtained.[9] Even though the EDE is commonly used in adults, it is an ideal method for assessing eating disorders in children because it allows the interviewer to explain the questions clearly to increase the child's understanding.[10]

However, there are several problems with the EDE that may interfere with accurate diagnosis. The interview was developed using identifying distinctive features of AN and BN. These features were mainly derived from patients with AN. This means that questions may not be fully applicable to BN, so BN patients are more likely to be underdiagnosed.[11] Another limitation of the EDE is bias in assessors when diagnosing patients with AN. Since AN patients weigh less than BN

patients, it may be easier for the assessor to give a diagnosis to AN patients but not BN. In addition, few studies have assessed the test-retest reliability of the EDE11. If the EDE lacks test-retest reliability, it implies that respondents may be giving inconsistent answers, preventing clinicians from giving an accurate diagnosis. The test-retest reliability of the EDE also weakens as the time between testing increases. Lastly, the interview is time-consuming and costly.

The EDE-Q is a self-reported questionnaire derived from the EDE and assesses the key attitudes and behavioral features of ED[12]. Since it is concerned with the current state of patients, the EDE-Q has a 4-week time frame. It assesses eating disorder symptoms referring to the past 28 days. It consists of 33 items and four subscales, like the EDE. The scores on these items are rated from 0-6, with higher scores indicating higher severity. It has been shown that the EDE-Q has good internal consistency, test-retest reliability and convergent validity.[13]

One strength of the EDE-Q is that it is economical, easy to administer and less time-consuming. Moreover, it has been shown that paper and pencil assessment methods provide more valid data than interviews in certain cases, particularly for shameful or secretive behavior such as purging or binge eating, since written assessments allow for more anonymity.[14] However, many concepts are difficult to accurately assess and lack operational definitions. For example, the term "binge" may be interpreted differently by participants. A subjective "binge" is when patients feel a loss of control over the amount of food they eat while "objective binge" is when the patient really consumes an excess amount of calories.[15] Furthermore, some patients may demonstrate denial of symptoms, and most assessment tools are developed for females. Even though the EDE-Q can be seen as an appropriate substitute for the ED interview in most ED features, it is shown that for features that are more complex, such as binge eating and concern about shape, the EDE-Q provides less accurate results.[16] Due to these limitations, it is important to revise the current method of assessment.

There are several issues with current research in the assessment of eating disorders. The samples in most studies pose a problem. Firstly, most studies only use a sample that consists of females, adolescents or undergraduates, and white ethnic groups, resulting in sampling bias. Consequently, the findings may not be generalizable to men, other age groups, or ethnic minorities. Franko and Becker (2007) indicated that ethnic minority individuals with eating disorders or weight related problems were less likely to seek treatment than non-minority individuals, possibly due to fear of stigma. This means that research in treatment may not be applicable to ethnic minority groups. Secondly, there are ethnic differences in eating disorder symptoms. Thus, clinicians should be more sensitive to cross ethnic differences during diagnosis.[17] In addition, most studies use patient samples, yet many of those with eating disorders do not seek medical treatment. Patients who are in treatment may already start to show an improvement in symptoms, thus it is most likely that the severity of the symptoms may be underestimated. Thirdly, much research uses self-reported questionnaires. However due to the fear of stigma or social desirability bias, some patients may under-report the severity of the symptoms, lowering the validity.

Studies comparing the results of self-reported and informant-reported data have mixed findings. Studies that measured personality using the Millon Clinical Multiaxial Inventory-II (MCMI-II)[18] found that a patient's response may be inaccurate or unreliable. This may be due to their shifted mental state during emotional distress, which may affect their ability to recall or their lack of insight into their personality. For example, a patient's anxiety or depression may affect their responses in self-reported personality inventories.[19] However, one study found high correspondence between self and informant reported data when they completed the Big Five Inventory and the Self Reporting Questionnaire For Assessment of Personality Disorder[20] It has also been shown that agreement tends to be higher for traits that can be easily observed.[21] This reflects that an informant report may only be an accurate reflection for certain behaviors, but not all behaviors. In eating disorder assessment, informant report can be used to assess more observable traits but not the "hidden behavior". Therefore, clinicians should consider both informant and self-reported data when giving a diagnosis.

To assess eating disorders in adolescents, previous research has been conducted to investigate the discrepancies between adolescent- and parent- reported information. Many researchers have found significant discrepancies between adolescent- and parent-reported psychopathology other than eating disorders. In one study, adolescents completed the Youth-Self Report[22] and parents completed the Child Behavior Checklist.[23] The agreement between parents and adolescents was very low for both internalizing problems, such as anxiety and depressive symptoms and externalizing problems, especially delinquent problems and total problem score.[24] This was especially true for children with parents with depression and anxiety, low child acceptance, parental dysfunction, and other factors that may lead to conflict between parents and children. In terms of eating disorders, it has been found that there was slightly higher agreement between parents and adolescents suffering from BN than AN.[25] This may be due to the fact that AN patients are more likely to be perfectionists so they are less likely to express their depression and anxiety while patients with BN tend to be more open about their feelings26. However there has only been a limited number of studies that looked at parent-report versus self-report for eating disorders.

Addressing discrepancies between informant and self-reported data is important. If clinicians are unable to collect

the right information, this will affect their ability to give a correct diagnosis. For example, if an informant reports that the patient does not purge but the self-reported data shows that the patient does engage in purging, determining whether to give a BN or Binge Eating Disorder diagnosis would be difficult.

There are several limitations in including an informant in the assessment of eating disorders. One major problem is that we are unable to identify whether the parent or patient is accurate, therefore a third informant such as a friend or therapist of the patient may be able to provide an additional perspective. Furthermore, there may be difficulty in recalling the symptoms since the EDE-Q has a 28-day time frame. This means that the patients may overestimate or underestimate the frequency that they engage in a certain behavior. Carter and Stewart shortened the time frame from 28 days to 14 days in order to reduce bias associated with retrospective recall, however this may also mean that cases with less frequent symptoms are underdetected16. Even in studies that included third party observers like parents, it has been indicated that some parents may be unaware of their child's illness or assume that their child's behavior is normal, or the child could be trying to conceal it from them.[26] Therefore, even though bias resulting from self-reported questionnaires may be reduced, there may also be observer bias.

Additionally, little research has been done about the hidden signs of eating disorders. Eating disorders are commonly associated with food restriction, fear of weight gain and compensatory behavior. However, there are many less commonly discussed signs about eating disorders, such as cutting food into small pieces, eating alone or wearing baggy clothes. It is important to study these hidden signs since these are strong indicators of the presence of an eating disorder. Studying these signs may aid clinicians in the diagnosis and allow new insights for further research in the field of eating disorders.

The proposed study

The purpose of this study is to investigate if the Disordered Eating Behavior Checklist is a better diagnostic tool for AN and BN in adolescents. This study testeda questionnaire that was created based on the symptoms of AN and BN and examines whether the relationship between self-reported methods and parental reports was moderated by diagnostic status. A third informant was also added to provide an additional perspective.

Hypothesis 1: There would be high agreement between self reported and parental report in the healthy group.

Hypothesis 2: Agreement in the sub-clinical and clinical group would be lower than in the healthy control group.

Hypothesis 3: Hidden behavior such as laxative use and purging would be reported more frequently by adolescent compared to the informants.

Hypothesis 4: There would be low agreement between adolescent and peer report in the clinical and sub-clinical group

Method

Participants

The sample consisted of three groups of participants: a healthy group which did not meet diagnostic criteria for any eating disorder, a subclinical group which were people that did not meet diagnostic criteria for any eating disorder but still exhibited some symptoms, and a group of patients that met diagnostic criteria for an eating disorder. Three groups were used so that we could clearly identify which participants did and did not have an eating disorder. This allowed us to compare the results between these groups so we could test the validity of the questionnaire. The subclinical group consisted of people who may be more likely to be inaccurately diagnosed by current questionnaires. By including this group, we could assess whether the questionnaire accurately diagnoses these participants.

Participants were adolescents aged 13-18 of any gender. All informants and participants gave consent to the procedure before participating in the study. For participants under 18, parent consent was obtained before the adolescent consented. The adolescents were told that the study was about assessing eating behavior and mood in adolescents but the term "eating disorder" was not mentioned in order to reduce bias. Participants were recruited through local advertisements, such as facebook advertisements and flyers. To increase the proportion of participants with eating disorders, we also advertised through eating disorder clinic wait lists. Patients with comorbidity other than anxiety and depression were excluded. In a study conducted by Swinburne and Hunt (2012), 65% of women with eating disorders also met criteria for at least one comorbid anxiety eating, suggesting that the prevalence of eating and anxiety disorder comorbidity is high and thus, including these participants is important for external validity[27]. However, patients who were in remission or treatment for an eating disorder were excluded. This was because there is usually a change in nature and perspective of the symptoms when people are undergoing recovery.[28] For example, the amount of food consumed in each binge eating episode tends to differ each time. During treatment, the amount of calories an individual consumes tends to decrease and there is a less intense sense of loss of control. Despite these changes, they still consider these episodes as binges. Thus, this demonstrates the difficulty for a standardized definition and interpretation.

Procedure

Patients underwent EDE training with a licensed clinician after their consent was obtained. This allowed us to identify whether they demonstrated any symptoms for an eating disorder, such as concerns with body weight or shape, restriction on dieting, excessive exercise or any physiological symptoms. After these symptoms were identified, they were assigned to the healthy group, sub-clinical group, or the clinical group based on whether they met diagnostic criteria.

Once the participants were divided into groups, they were asked to invite a parent or guardian who lived with them and a close friend to join the study. A close friend was defined as someone who saw the person at least 5 days a week and had known them for at least two years. If the participant did not have a friend who met the criteria above, they were asked to choose the friend that knew them the best. Prior to the study, the parent and friend were educated on eating disorders and the types of symptoms associated with it. This allowed them to more easily identify the symptoms during their observations, increasing the accuracy of the results. After that, the informants were given a 14-day period to conduct an observation.

The adolescents completed an adapted version of the Eating Questionnaire-A (EDE-A). The EDE-A is derived from the EDE-Q. It has 36 items and yields the same four sub-scale and global score as the EDE-Q. However instead of having a 28-day time frame, the time frame is shortened to 14 days16. For my study, I reframed questions with sensitive terms such as " binges", "diuretics" and "calories" to phrases that were easier to understand, thus making this survey more accessible, particularly for younger and less educated participants. For example, the question "Have you had eating binges?" was reframed as "Have you consumed a large amount of food in a short period of time?". The question "Have you taken diuretics to control your shape or weight" was reframed as "Have you ever used medication to control your shape or weight?".

The questionnaire that I designed for the informants was divided into four subscales. Three subscales aligned with the EDE, including restraint, eating, and shape concern. This was to allow for easy comparison with the EDE questionnaire that the adolescents completed at the beginning of the study. Previous studies have shown that the way of assessing "weight" and "shape" concerns are very closely associated with each other as a concern about weight was a secondary consequence of concern about shape28. Therefore, I decided to merge the weight and shape concern subscale in my questionnaire. There was also an "other" scale; this includes symptoms that were less commonly talked about and usually seen as hidden signs. The time frame for the questionnaire was 14 days and the informants were asked to fill this questionnaire at the end of the 14 days.

Question
Restraint
• Have they been eating less/skipping meals?
• Are they not eating after a certain time (Eg. not eating after 6pm)?
• Have they been avoiding a certain food such as refusing to eat something when offered?
• Is there a dramatic change in their diet such as cutting out a certain food group from their diet?
• Do they often cook for others but not eat the meal themselves?
Eating Concern
• Do they demonstrate eating rituals such as eating very slowly, cutting up food into smaller pieces, or mixing food in a bizarre way?
• Do they spend an excessive amount of time looking at nutritional labels, such as looking at the calories on labels before purchasing a food item?
• Do they avoid eating in social situations by making up excuses?
• Have they been eating more alone lately, such as eating in their room or eating after everyone is done eating?
Shape and Weight Concern
• Do they spend an excessive amount of time in the bathroom (Eg. more than 1 hour)?
• Do they often wear baggy clothes to hide their body?
• Do they often talk about their body flaws?
Others
• Do they reject family or friends' invitations for dining out?
• Do they demonstrate a loss of interest in things that they used to enjoy?
• Have they attempted to hide food or food wrappers?

Each question was rated on a scale from 0-6, with 0 indicating no days and 6 indicating every day from the past 28 days.

One main difference between my questionnaire and the EDE questionnaire was that while the questions on the EDE ask about the person's cognition and thoughts, my questionnaire was based more on observable behavior. For example, the EDE contains questions like "how concerned have you been about other people seeing you eat?". Another way of assessing this would be "Do they reject family or friends invitation for dining out?". While people can lie or deny their thoughts, observable behavior is a more objective way to measure any eating disorder symptoms. Therefore, this would help reduce the impact of cognitive bias that may have on the results, increasing the validity. Table 1 displays the questions included in the questionnaire.

The study was used to validate the questionnaire. I compared my measure to the clinicians rating of eating disorders to test for convergent validity. I also compared it to the clinician's rating of depression and anxiety to test for discriminant validity to make sure the questionnaire only assessed symptoms of eating disorders. The way my questionnaire was scored was the same method as the EDE. To obtain a global score, the four subscale scores were summed and the resulting total divided by the number of subscales. To test for hypothesis 1,2 and 4 a correlation test was used to test for agreement levels. To test for hypothesis 3, an analysis of variance (ANOVA) was used to compare levels of reported hidden behaviors among the three groups (adolescent, parent, and third informant).

Results

Hypotheses 1: Studies have shown that EDE-Q could only accurately assess individuals who exhibited the lowest level of eating disorders, but as eating disorder behavior increases, EDE-Q becomes less reliable13. Therefore, a high agreement in the adolescent self-reported and informant scores for individuals without any disordered eating behavior or a diagnosis of eating disorder was expected.

Hypotheses 2: Some discrepancy in scores was probable for the subclinical and clinical groups. In these groups, informants reported a higher score while the adolescent report had a lower score. High degree of depression, low child acceptance, and parental dysfunction are all risk factors of eating disorders and also linked with low parent child agreement25. Therefore, eating disorder patients would have lower agreement with their parents. Previous studies have shown that there are significant differences between the EDE and EDE-Q ratings, especially in the shape concern subscale14. This may be due to the fact that individuals often feel embarrassed to talk about their weight or they often show denial. Therefore, the informant observation may more accurately reflect any shape and weight concern. For example, their friends and family would be able to see that they are wearing baggy clothes, which is actually a way to hide their body shape and make their weight loss less noticeable.

Hypotheses 3: In contrast, adolescents reported purging behavior such as vomiting and laxative use more frequently than the informants. These behaviors are usually more hidden and are usually done when the person is alone. Therefore, it was challenging for informants to identify such hidden behavior. In terms of the eating restraint subscale, parent's report would be a more accurate reflection. These behaviors can be seen during family meals, such as cutting food into small pieces, taking a long time to chew or picking the lowest calorie options. The intention of this is to make the food last longer and be used as a way to relieve anxiety. The individual may be aware of these behaviors, but they would not realize that it is a result of their eating disorder. Even though the adolescent may have been able to recall these symptoms, the informants were taught about these symptoms and know what they are looking for. Therefore, informants may have had a more accurate reflection of these behaviors.

Hypotheses 4: There would be even lower agreement between the adolescent and the peer report. The peer reported a lower score than the adolescent themselves. This is because eating disorders are usually disguised and not so easily observed in public situations, such as school or workplace. Thus, the friend may only have been able to observe a little or even no disordered eating behaviors. One study showed that the pressure associated with public expectation can cause people to exhibit multiple "selves".[29] This may be used to explain why adolescents may act differently in front of their friends because they may be ashamed of their own disordered eating behavior and do not want to let their peers know that they are suffering from an ED. Therefore, they only exhibit disordered behaviors such as purging, binging, eating extremely small amounts of food at home but not in front of their friends.

Discussion

The projected results of this study tell us that there can be significant discrepancies between self-reported and informant-reported data. This is significant as it shows that clinicians cannot solely rely on the self-reported data from the patients. Clinicians should conduct questionnaires or interviews with multiple informants during the assessment on ED in order to reduce misdiagnosis. In addition, clinicians should note that patients often underreport their symptoms and signs of denial are common. It is crucial that clinicians gain a full picture of the psychopathology before deciding whether or not there is a diagnosis. Furthermore, when conducting interviews with patients, clinicians can try to use fewer sensitive phrases such as "binge eating" or "restricting" and use more common and everyday language, as is used in the Disordered Eating Behavior Checklist. This can help the patients understand the question

better and reduce any feelings of shame and doubt.

These findings can also be used to assess other psychiatric illnesses. The main purpose of including an informant is due to the fact that self-reported data are usually inaccurate due to feeling of shame. Underreporting of symptoms are not only seen in eating disorders but also in different psychiatric illnesses. People with depression may be less willing to talk about their symptoms due to embarrassment and stigma. Pyne et al found a positive correlation between self stigma and depression severity. Those in treatment experienced a high level of perceived stigma.[30] A study also showed that people who give more socially desirable answers tend to underreport depressive symptoms. However, this correlation was not found when using more objective measures of health, such as being in the hospital.[31] This may suggest that it is better to conduct assessments in a more normative assessment where the patient feels comfortable talking about their symptoms. Another reason for underreporting symptoms may also be refusal to start treatment. For example, people with addiction may underreport the frequency of their addictive behavior due to fear of withdrawal symptoms during recovery. Multiple studies have shown that pregnant adolescents underreport substance use due to fear of legal consequences, memory failure and social desirability.[32] Thus, it is crucial to include an informant when assessing psychiatric illness.

If informant reported data can give clinicians a better picture of the patient's symptoms, this would help clinicians give a more accurate diagnosis. As a result, the patient would be able to get the correct treatment, improving their chance of recovery.

One of the possible explanations for the discrepancy in parent and adolescent reports may be due to the way the two different questionnaires are worded. The Disordered Eating Behavior Checklist uses more common language and is easier to interpret while the EDE-A has more complex language. Therefore, some adolescents may have had difficulty interpreting the questionnaires, and they may have underreported the frequency of some behaviors.

Previous studies have shown mixed results in the frequency of the most "hidden behavior" such as binging and purging between parent report and children reports. One study found that parents reported that their children engage in binge eating episodes more frequently than their child does[33] while another study found that adolescents were more likely to report binge eating behaviors than their parents28. This may be due to the fact that parents and adolescents may have different interpretations of what a large amount of food looks like.[34] This has also been a problem shown when using questionnaires. Therefore, further research should be done to propose a more objective way to measure the frequency of binge eating episodes.

The purpose of this questionnaire was to gain a holistic view of the symptoms of eating disorders. If this questionnaire were to be used in a research setting to assess symptoms of eating disorders (e.g., for research on risk factors), we would average out the scores to create one total score and gain a multifaceted picture of the patient's symptoms. Because this is not a diagnostic tool (and thus score dimensionally as opposed to categorically), there is no need to choose between whether to rely on the adolescent or informant.

The strength of my questionnaire is that it is mainly designed to assess the more "hidden behaviors" of eating disorders which are not normally seen as symptoms of eating disorders. Identifying these disordered behaviors can help overcome the problem of social desirability bias or deception when using a questionnaire. One way to identify these behaviors is to have close friends or family of the patients to do a naturalistic observation. A naturalistic observation has a higher ecological validity compared to a questionnaire and it doesn't aim to manipulate any behavior. However, it should be noted that the goal of this using an observation is not to have the informant diagnose the adolescent with an eating disorder, but if the informant is able to accurately report these symptoms, this could help clinicians improve the accuracy of their diagnosis.

A second strength is that by asking an informant, this can overcome the problem of difficulty in recalling symptoms. Wilfley and colleagues found that children experiencing eating disorders usually find it difficult to admit and describe their disturbance on questionnaires due to a strong sense of guilt, shame or difficulty comprehending the question.[35] In addition, the escape theory suggests that when an individual engages in a binge eating episode, they shift to a state of low self-awareness, making recall difficult.[36] Therefore, by educating the informant about the symptoms, they would pay more attention to these behaviors when they occur. Another strength is by using multiple informants, judgment from multiple people could be received which can increase the reliability of the results. Kenny (1994) suggested that informant reports provided more insightful information than the person himself because the judgements were based more on "currently observable reality".[37] This suggests that observation from others may be less biased and are better predictors of behavior.[38]

This study has several limitations. First, the study only used adolescents because it was harder to find close informants of adults that are able to observe disordered eating behavior. This means that adults may display different symptoms than the adolescents and so the Disordered Eating Behavior checklist may not be validated for adults. Future studies should use this questionnaire on adults to see if there would be any difference. Moreover, given the nature of the research study, participants might be more open to talk than typical eating disorder patients. Therefore, they might be less likely to misrepresent their symptoms. Indeed, most people with an eating disorder do not seek treatment and believe that they do not have a problem.[39] This questionnaire may be less valid for patients who

are less willing to talk about their symptoms because they may under-report their symptoms.

Another limitation is that the study only uses a 14-day time frame. For a diagnosis of bulimia nervosa, the binge eating episodes and compensatory behavior has to occur for at least once a week for at least three months. Moreover, some behavior may not occur within the 14-day time frame. This means that even though the adolescent or informant did not report any behavior, it does not mean that the adolescent did not ever engage in the specific behavior. Instead, it means that the behavior did not occur within the 14-day time frame. Therefore, the questionnaire does not give a full picture of the course of the eating disorder.

Lastly, research has shown that informant reports are not totally accurate and there may still be some bias. Even though the parents were educated about eating disorders, a study shows that parents of anorexic patients tend to be unaware of their child's problem25. Therefore, they may also underreport the symptoms and assume that their behavior is normal. The level of agreement may also depend on the type of eating disorder. Salbach-Andrae found that there was a higher level of agreement between adolescent and parent report for adolescents suffering from BN compared to AN25. Signs of denial and minimization are shown to be common in adolescents with AN33. Therefore, AN patients tend to be more reserved and are less willing to talk about their symptoms. On the contrary, BN patients are characterized by high novelty seeking, high harm avoidance and low-self directedness.[40] Thus, they may be more willing to express their feelings openly. Vazire 2006 showed that even though informant reports are a cheap, fast and easy way to collect data, some informants may be uncooperative and give dishonest answers.[41] Furthermore, the reliability of the informant may also vary. Some information may be more attentive while some may take less notice of their friend's behavior and are less close to them. Thus, it is important that the clinicians collect data from a family member or friend that is close with the adolescent. Despite the limitations of informant report, there is still bias in self-report and informant reports could help counter the bias of self-report.

Based on the results, it is also known that the second informants, the friends reported less valid data since the adolescents may have tried to disguise their eating disordered behavior in public situations. Thus, the clinician should not rely on a friend's report regarding "hidden behavior" such as purging or binging. However, the friends still provided some valid data on some questions like "Do they often discuss diet and food" or "Do they reject invitations for eating out?" These behaviors can be more easily observed and having a third perspective can be helpful. Therefore, it is important for the clinicians to consider what aspects of behavior to consider when interpreting the informant report.

Conclusion

This study highlights the biases in self-reported data for eating disorders. It is important to recognize signs of denial when diagnosing eating disorders. Clinicians should rely on reports from multiple informants and be more aware of the "hidden behavior" in AN and BN. Further studies should use a more representative sample and extend the time frame so that clinicians can also use the results to help with diagnosis in adults, not just adolescents.

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