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Research Paper

Prevalence and Relationship of Orthorexia Nervosa with Self-Esteem and Lifestyle Satisfaction in Indian Married Women

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ABSTRACT

Orthorexia nervosa is an eating disorder revolving around an unhealthy obsession with eating healthy and the quality and nutritional value of the food. Through review of available studies on orthorexia nervosa a gap in knowledge is established, especially in context of India. It has also been found to be more prevalent in women and to be overlapping with other eating disorders and mental health issues. Further the difference in the cognitive ideation of other eating disorders and orthorexia nervosa is highlighted to explain the difference in the associating factors of the disorder from that of general factors often studied in light of eating disorders like Anorexia Nervosa etc. This study aimed to determine the prevalence of Orthorexia Nervosa in Indian married women. The purpose here is also to elaborate and explore the relationship of self-esteem and lifestyle satisfaction with orthorexia nervosa. A sample of 128 Indian married women is taken from different parts of the country and is administered through an online survey. The survey consists of three questionnaires namely, ORTO-15 by Donini and colleagues for assessing orthorexic tendencies, Satisfaction with life scale (SWLS) by Diener for assessing lifestyle satisfaction and Rosenberg's self-esteem questionnaire by Rosenberg for assessing self-esteem levels in the sample group. The data is analyzed for calculating Bivariate correlation (Pearson's constant) as well as simple linear regression to establish the nature of relationship between self-esteem and orthorexia nervosa and lifestyle satisfaction and orthorexia nervosa. The results indicate a high prevalence of orthorexia nervosa in the sample with an average of 89.80% of the total sample showing orthorexic tendencies. Further through correlational analysis, no linear relationship was found between self-esteem and orthorexia nervosa ($r = -0.17$, $p>0.05$) as well as lifestyle satisfaction and orthorexia nervosa ($r = -0.052$, $p>0.05$). Lastly simple linear regression of the variables against orthorexia nervosa indicates a lack of linear relationship of self-esteem (R Square = 0.0003) and lifestyle satisfaction (R Square = 0.0029) with orthorexia nervosa. A high prevalence of Orthorexia Nervosa can be concluded in the sample of Indian married women with no linear relationship with self-esteem and lifestyle satisfaction. This study acts to fill the gap in knowledge around Orthorexia Nervosa in India and encourages to study further associates of the disorder in different sample groups.

Keywords: *Orthorexia Nervosa, Self-Esteem, Lifestyle Satisfaction, Indian, Married, Women*

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There exists an indisputable and a consequential relationship between food and health. What we eat is what we become. This very notion of this direct association between our health and eating patterns has led to a number of eating disorders known today. The practice of categorizing food groups into good and bad categories has given rise to a fairly new eating disorder called orthorexia nervosa.

Orthorexia Nervosa

The word "orthorexia nervosa" refers to an obsession with eating healthy or the purity and the quality of food (Muhlheim, 2021). This disorder sets in when a choice of eating healthy becomes a compulsion and the individual no longer can relax from their own eating rules (Thomas, n.d). Orthorexia nervosa is still under research and hence has not yet been identified by Diagnostic and Statistical Manual of Mental Disorder -V (2013) as well as American Psychological Association (APA) as an eating disorder yet. The diagnosis of this disorder is often more challenging than other eating disorders as healthy eating is rarely seen as a fault and in fact is appreciated and reinforced hence professional help is required. Orthorexia nervosa can have several negative consequences including extreme weight loss, malnutrition etc. There are three prime factors which are associated with this disorder, namely extreme restriction, self-imposed anxiety and maladaptive behaviors and thoughts (Petre, 2020). Orthorexia nervosa has symptoms and patterns which overlap with other eating disorders too, such as weight fluctuations, restriction etc. however the difference between orthorexia and other disorders like Anorexia nervosa lies in the belief system and the cognitive ideation of this disorder (Bratman & Steven, 2017). Orthorexic people are more focused on health and not on weight loss or thinness. A person with orthorexia nervosa does not try to hide their eating patterns because they are often proud of eating obsessively healthy whereas when we talk about orthorexia nervosa, the person is concerned with the quality and purity of the food and hence during treatment they fear being fed something that does not match their level of purity or is not nutritionally rich. Many tools have been put forward for the assessment of this disorder however further applications and research is required to determine the validity of the assessment strategies (Thomas, n.d). Further studies have been going on to associate orthorexia nervosa with several other mental health disorders which have been found to comorbid with eating disorders like Anorexia Nervosa. Some of these disorders include obsessive-compulsive personality disorder and some other anxiety disorders. However no real trends have been identified yet which could help in the tracking of the disorder or to understand its prognosis. Orthorexia Nervosa, like any other eating disorder, is found to be more prevalent in females than in males (Sanlier, Yassibas, Billici, Sahin & Celik, 2016).

Self-Esteem and lifestyle satisfaction in disordered eating

Self-esteem has often been found as the secondary predictor of eating disorders and associated factors (Shea,2007). Further a few studies have found that people with low self-esteem are more prone to developing abnormal eating behavior (Mora, Rojo, Banzo & Quintero, 2017). In terms of lifestyle satisfaction, it has been found that certain domains pertaining to disordered eating behavior might have a potential role to play in the levels of lifestyle satisfaction. It has been found that aspects like weight and physical appearance are more strongly correlated with lifestyle satisfaction than other factors like health, fitness and so on (Matthews, Zullig, Ward & Horn, 2012). Hence both self-esteem and lifestyle satisfaction are risk factors for eating disorders.

Self-esteem and lifestyle satisfaction in orthorexia nervosa

There has not been much research studying self-esteem and lifestyle satisfaction as predictors or associating factors of orthorexia nervosa. This could be because the eating disorder itself is still largely unexplored. Both self-esteem and lifestyle satisfaction have been found to largely correlate with factors like body image, weight issues and physical appearance in terms of disordered eating (Matthews, Zullig, Ward & Horn, 2012). However, orthorexia nervosa revolves around issues which are very different from the ones listed above. Orthorexic tendencies focus on health, fitness, and the quality rather than on weight and appearance suggesting a weaker role of self-esteem and lifestyle satisfaction as risk factors for this disorder. Further a preoccupation with healthy and proper food is not found to be associated with body image issues (Matera, 2015) and self-esteem and lifestyle satisfaction are most strongly correlated with these factors instead. Moreover a few studies which did found any correlation between self-esteem and orthorexia nervosa, stated that this relationship was often mediated with other factors like spirituality and hence not direct in nature (Bona, Erdesz & Tury, 2021).

Orthorexia Nervosa in India

In the Indian context, orthorexia nervosa is hardly studied leaving a gap in knowledge regarding the Indian trends of the disorder. According to the observation made by Roy and Shroff (2014), it is much more difficult to study orthorexia nervosa in India than any other country owing to the many religious and spiritual restrictions in eating practiced in India. Religions like Jainism strictly avoid onions and garlic and a lot of cultures forbid eating non vegetarian food. This makes the task of differentiating pathological eating behavior from what is practiced in the name of religion.

Marriage and disordered eating

Many studies have been conducted studying the association between marital status and disordered eating behaviors. The assumption lies on the foundation that marriage could lead to change in eating habits due to family modification, culture and changing relationships. It has been found that people living with a partner tend to show higher levels of eating symptomatology as well as pathology (Bussolotti, Aranda, Solano, Murcia, Turon & Vallejo, 2002). Further comparative studies have been conducted to understand the range of variance of occurrence of eating disorders in people who are married versus those who are unmarried, and it has been a general trend to observe higher disordered eating behaviors as well as pathology in people who have marriage dissatisfaction or are married than in people who are not married and are just living with a partner (Woodside, Lackstrom & Wolfson, 2000).

MATERIALS AND METHODS

Locale

A few studies have concluded that low self-esteem is often linked with abnormal eating patterns but not a lot of work has been done in terms of direct relationship with orthorexia nervosa. Most of the studies associate self-esteem to eating behavior in terms of weight issues and body image, however orthorexia nervosa does not revolve around these constructs and rather has a focus on health and nutrition which makes the study of self-esteem in context of factors associated with orthorexia nervosa (quality of food, health concerns, nutritional value of food etc.) important. Similarly, a few studies could be found linking dissatisfaction with life to disturbed eating behavior but hardly any work can be found in terms of direct relationship with orthorexia nervosa. Further, work has been observed on

orthorexia nervosa as a potential eating disorder and its associated variables which mainly consists of body image issues and its prevalence in fitness professionals. Self-esteem and life satisfaction are not treated as main variables being studied in most research and their role in the prevalence of this disorder remains unexplored.

Lastly, there is negligible work done on orthorexia nervosa in the Indian context, let alone its associating factors. There are hardly any studies which address the onset or the possibility of occurrence of this new disorder in the Indian population. In the Indian context, orthorexia nervosa is hardly studied leaving a gap in knowledge regarding the Indian trends of the disorder. Orthorexia nervosa has been found to be much more complicated to study in India due to the expansive nature of vegetarianism in the country along with overlap of religious practices and eating behaviors of people thus making it difficult to recognize orthorexic tendencies hence giving way to lack in knowledge.

Objectives

This study has the following objectives: -

- To study the prevalence of Orthorexia Nervosa in a sample of Indian Married Women
- To determine the relationship between self-esteem and Orthorexia Nervosa in a sample of Indian married women.
- To determine the relationship between lifestyle satisfaction and Orthorexia Nervosa in a sample of Indian married women.

Hypotheses

Based on the review of literature, following hypotheses were proposed:

Studying the prevalence of Orthorexia Nervosa in Indian married women

1.1 There will be a high prevalence of Orthorexia Nervosa in Indian Married Women.

Correlational studies: Relationship between self-esteem and Orthorexia Nervosa in Indian married women.

2.1 There will be no significant relationship between Self-esteem and Orthorexia Nervosa in Indian married women.

Correlation studies: Relationship between lifestyle satisfaction and Orthorexia Nervosa in Indian married women

3.1 There will be no significant relationship between lifestyle satisfaction and Orthorexia Nervosa in Indian married women.

Participants

The sample for this study consists of 128 Indian married women with an average age range of 30 to 40 years. Purposive sampling design is employed to make sure that only those women were included who've been married for more than a year. Sample is selected from various parts of the country. All the subjects are informed about the aim of this study as well as their role. Informed consent is taken before enrolling them as subjects in the study. Only Married women are selected as subjects to ensure homogeneity and to avoid any gender-based deviations.

Materials

Following tools were used for the current study: -

ORTO-15 (Donini, Marsili, Graziani, Imbraile & Cannella, 2005)

The ORTO-15 is a questionnaire developed by Donini and colleagues (2005) for the diagnosis of Orthorexia Nervosa. This questionnaire is made up of 15 multiple choice items and is to be answered on the basis of one's eating habits and ideology. This scale was constructed out of a previous version which was used by the pioneer of Orthorexia Nervosa, Dr. Bratman. Here, the answers which indicate the presence of orthorexic tendencies are given a score of 1 while those which indicate normal eating behavior were given a score of 4 and the final sum is the total score of the subject on the scale. For interpretation, scores below or equal to 40 indicate probability of orthorexic tendencies while a score above 40 indicates normal eating behavior. This scale is widely used for the diagnosis of orthorexia nervosa and has been validated and is seen as reliable for the diagnosis of the concerned disorder, however since the disorder itself is under study, the scale too requires more application.

Satisfaction with life scale - SWLS (Diener, 1985)

Satisfaction with life scale also known as SWLS was developed by Diener and colleagues (1985). It assesses the overall satisfaction people have with their life and hence it takes a general approach enquiring about the basic foundation of one's life. This scale consists of 5 items which are more global in nature than specific. It allows the respondents to think about each item in accordance with their own perspective. The 5 items are supposed to be rated along a Likert scale stretching from strong agreement to strong disagreement. The maximum score possible is 35 while minimum score possible is 5. High total score indicates high satisfaction with life while low total score indicates low satisfaction with life. This has successfully been applicable all over the world including India and hence has great applicability.

Rosenberg's self-esteem questionnaire (Rosenberg, 1965)

This scale has been developed by Rosenberg (1965) to assess the self-esteem levels of the subject. This tool is widely used in social science research. It consists of 10 items which are This scale has been developed by Rosenberg (1965) to assess the self-esteem levels of the subject. This tool is widely used in social science research. It consists of 10 items which are responded to on a 4-point Likert scale stretching from strong agreement to strong disagreement. Out of these 10 items 5 are positively worded and 5 are negatively worded. This scale aimed to measure the global self-worth of the subject by inquiring about both negative and positive feelings and thoughts about the self. This scale has been translated in a number of languages and is used worldwide for conducting studies and assessing people in various settings.

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Data collection

The data for this study is collected thorough an online survey consisting of three tools namely, ORTO-15 for orthorexia nervosa, Satisfaction with Life Scale (SWLS) for lifestyle satisfaction and Rosenberg's Self-Esteem questionnaire for self-esteem. All the subjects were ensured that their responses will be kept confidential and will be used for research

purposes only. The subjects were asked to fill in their basic information including demographic details. The online survey was administered to a sample of 128 Indian married women with an average of 30 to 40 years of age. The respondents to whom the form was forwarded were distributed throughout the country. For each scale included in the survey, clear instructions were stated, and the subjects were encouraged to attend to each item as honestly as they could.

Scoring

After collection of the data from the sample, the raw scores were tabulated in order to subject them to various statistical analysis. The scoring for each of the scales used in the survey was done according to the norms stated in their respective manuals. The total raw scores of each of the subjects were categorically tabulated and analyzed using statistical techniques viz. **Descriptive Statistics, Bivariate Correlation (Pearson's Constant), and Simple Linear Regression**, to justify the purpose of this study.

Variables

For the purpose of this study, the following variables were chosen-
Independent Variable - Orthorexia Nervosa
Dependent variable 1 - Self-Esteem
Dependent variable 2 - Lifestyle Satisfaction

RESULTS AND DISCUSSION

The aim of this study was to understand the prevalence of Orthorexia Nervosa in Indian Married women and to evaluate the relationship between self-esteem and Orthorexia Nervosa through correlational studies. The word "orthorexia nervosa" refers to an obsession with eating healthy or the purity and the quality of food (Muhlheim, 2021). This kind of restrictive eating then eventually leads to malnutrition along with social, psychological hazards, and lower quality of life. One of the variables being analyzed in this study is Self-Esteem, which can be conceptualized as to how people view themselves and the worth or the value which they attach to themselves. Lastly Lifestyle Satisfaction was one of the variables studied in this report. Lifestyle satisfaction is a term which is often used interchangeably with happiness however, it refers to the overall feeling or attitude towards one's life and not just based on current levels of happiness. There have been studies highlighting the role of self-esteem and lifestyle satisfaction in the prevalence as well as maintenance of disordered eating patterns pertaining with factors like body image, weight issues and physical appearance in terms of disordered eating (Matthews, Zullig, Ward & Horn, 2012). However, orthorexia nervosa revolves around issues which are very different from the ones listed above suggesting a weaker role of self-esteem and lifestyle satisfaction as risk factors for this disorder. A few studies which did found any correlation between self-esteem and orthorexia nervosa, stated that this relationship was often mediated with other factors like spirituality and hence not direct in nature (Bona, Erdesz & Tury, 2021). Finally in the Indian context, orthorexia nervosa is hardly studied leaving a gap in knowledge regarding the Indian trends of the disorder. In context of this research gap, this study was designed to involve a correlation-based structure to evaluate the relationship of self-esteem and lifestyle satisfaction with Orthorexia Nervosa separately. Orthorexia Nervosa was assessed using **ORTO-15** by **Donini, Marsili, Graziani, Imbriale & Cannella (2005)**, self-esteem was assessed using **Rosenberg's Self-esteem questionnaire (1965)** and lifestyle satisfaction was evaluated using **Satisfaction with Life Scale (SWLS)** by **Diener, Emmons, Larsons & Griffins (1985)**. Data collection was done through an online survey.

Prevalence of orthorexia nervosa in Indian married women

It was hypothesized that there will be a high prevalence of Orthorexic tendencies in Indian married women. It was found that 89.80% of the total sample reflected Orthorexic tendencies pointing to a high prevalence in the sample group (table 1.1), thereby leading to the acceptance of the first hypothesis.

Table 1.1: Frequency and Interpretation for Orthorexia Nervosa

Class	Frequency	Interpretation	Percent
25-40	114	Orthorexic Tendencies	89.80%
41-60	13	Normal Eating Pattern	10.20%

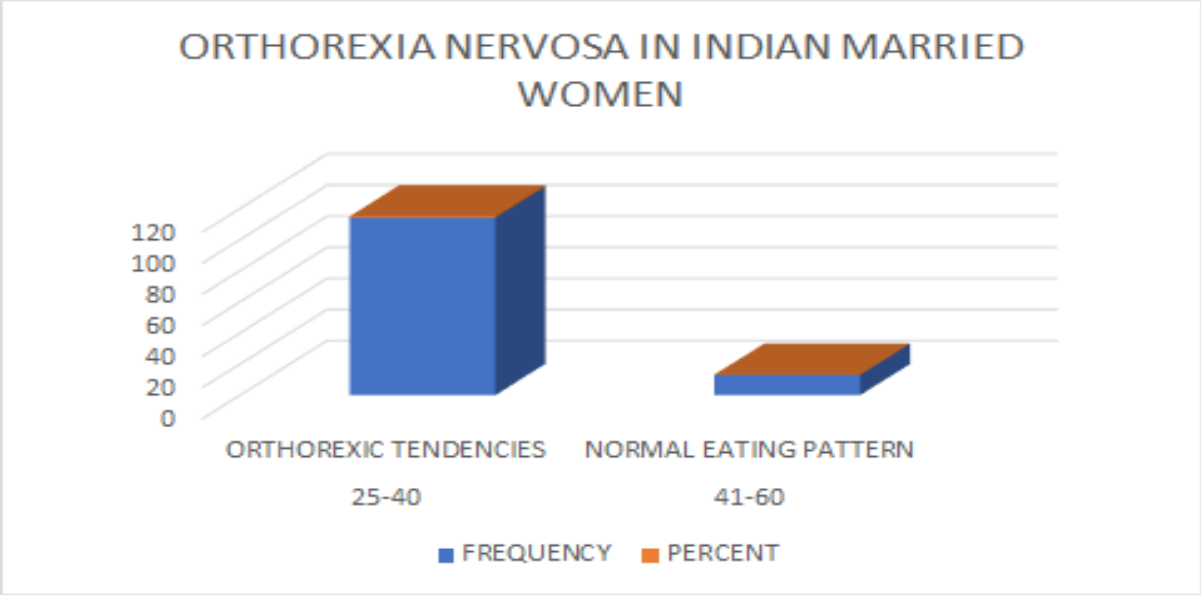

Figure 1: Bar Graph showing frequency distribution of people with orthorexic tendencies in the sample group.

To establish the trend of high prevalence of orthorexia nervosa in women, review of previous studies on the topic was undertaken. Dasgupta, Mahana, & Bhagat (2014) analyzed the obsession with healthy eating to understand the prevalence of Orthorexia Nervosa. A sample of 30 nutrition professionals and 30 non-nutrition professionals was taken and an ORTO 15 scale was administered on them. Data was collected for different aspects like smoking behavior and weight management. It was found that 56.66% of people were orthorexic and 60% of nutritionists showed orthorexic behavior. Further, most of these people were women and were found to be underweight. These findings were attributed to their obsession with healthy eating. This study and more suggest the need for studying this disorder as well as emphasizes similar trends as observed in this report, that is, high prevalence in females.

Self-esteem and lifestyle satisfaction in women with orthorexic tendencies

Corresponding to Self-Esteem, the mean score came out to be equal to 31.25, suggesting a high self-esteem on an average. Further it was found that 51.20% of the total sample obtained high levels of self-esteem and 49% of the sample obtained moderate self-esteem signifying absence of low self-esteem in the sample group (table 1.2).

Table1.2: Frequency and Interpretation for Self-esteem

Class Interval	Frequency	Interpretation	Percentage
20-30	62	Moderate self-esteem	49%
30-40	65	High self-esteem	51.20%

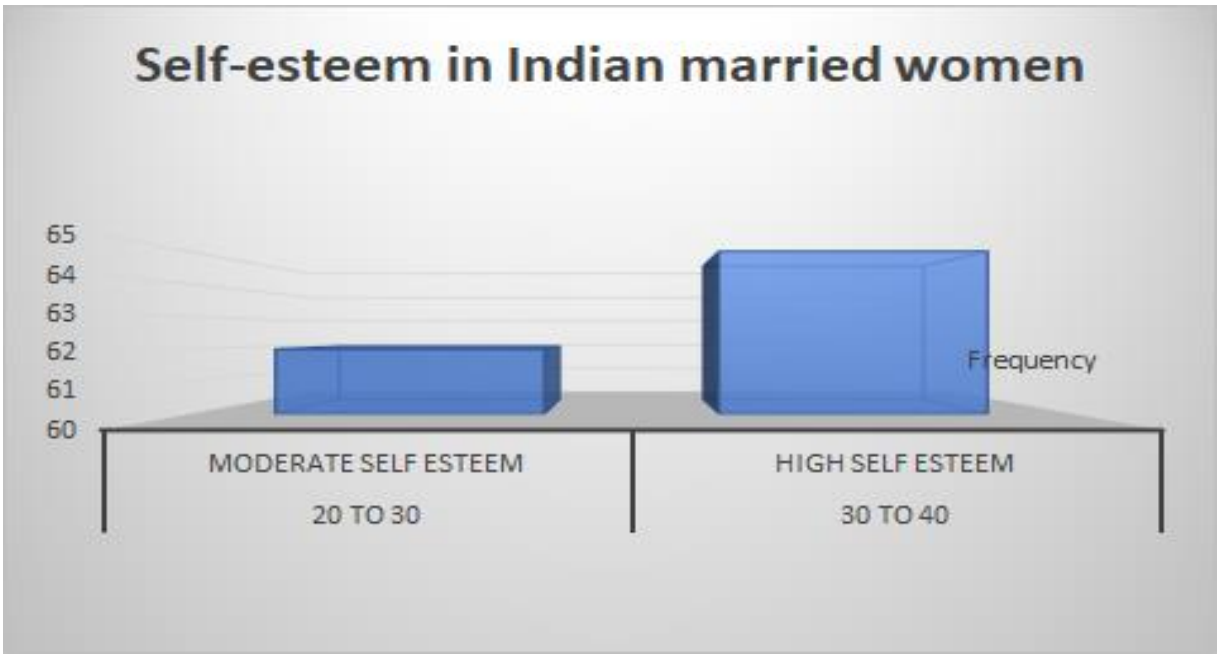

Figure 2: Bar graph showing frequency distribution and interpretation for Self-esteem.

The high self-esteem here can be explained through studies which suggest self-esteem to be a mediating factor for disorders revolving around drive for thinness, and weight issues. Along the same line, Hojjat, Zamani, Fathirezaie & Gerber (2020) studied the relationship between self-esteem, body image and disordered behavior. A sample of 263 adolescent females was taken and was asked to complete questionnaires on the above three variables. It was found that high scores on self-esteem were associated with higher scores on disordered eating behavior as well as physical activity. Further no association was found between body image and disordered eating behavior. The results suggest the need for more work in this area. It can be observed from this review of literature that self-esteem is often associated with factors like body image, weight issues and drive for thinness. Further it has been found to play a secondary or a mediating role in the onset of eating disorders. No relationship has been found with health and nutritional issues.

For Lifestyle Satisfaction the mean score came out to be equal to 26.606 which indicated satisfaction with life on an average. Further it was found that 36.20% of the total sample showed satisfaction with life whereas 26% of the sample showed extreme satisfaction. On the other hand only 0.80% of the sample was extremely dissatisfied and only 3.10% of the sample was dissatisfied (table 1.3).

Table 1.3: Frequency and Interpretation for Lifestyle Satisfaction

Classes	Interpretation	Frequency	Percent
5 to 9	Extremely Dissatisfied	1	0.80%
10 to 14	Dissatisfied	4	3.10%
15 to 19	Slightly Dissatisfied	9	7.10%
20	Neutral	3	2.40%
21 to 25	Slightly Satisfied	31	24.40%
26 to 30	Satisfied	46	36.20%
31 to 35	Extremely Satisfied	33	26%

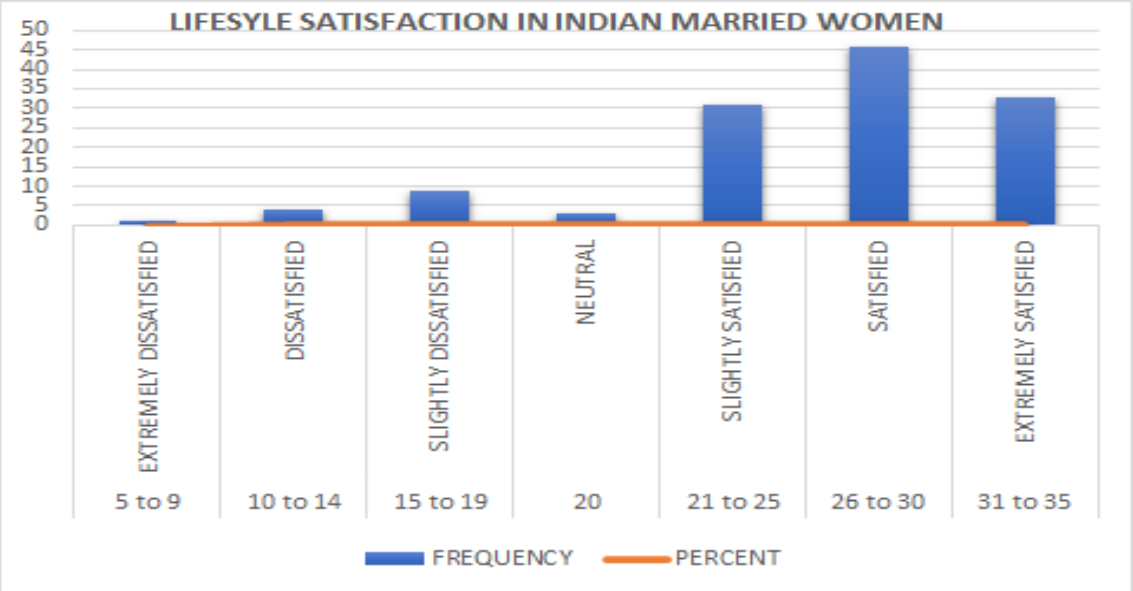

Figure 3: Bar graph showing frequencies and corresponding Indian married women.

Matthews, Zullig, Ward, Horn & Huebner (2012) analyzed the relationship between life satisfaction and eating behaviors and weight perceptions. A sample of 723 college students was taken. Logistic and multiple regression procedures were used on the data. Results showed that life satisfaction was negatively correlated with eating behaviors as well as weight consciousness. This study also highlighted the link between life satisfaction and eating disorders in context of weight consciousness and related behaviors. No studies have

been found to relate lifestyle satisfaction with ideation around nutritional value and quality of food.

Relationship of orthorexia nervosa with self-esteem and lifestyle satisfaction

Bivariate correlation (Pearson's Constant) was computed between Orthorexia Nervosa and Self-Esteem as well as orthorexia nervosa and lifestyle satisfaction to determine any possible relationship between these variables. (Table 1.4) It was found that Self-Esteem was not significantly related to Orthorexia Nervosa in Indian married women (r = -0.17, p> 0.05). The relationship between Self-Esteem and Orthorexia Nervosa has been graphically represented (Figure 4). Further, it was found that Lifestyle Satisfaction was not significantly related to Orthorexia Nervosa in Indian married women (r = -0.052, p > 0.05). The relationship between Lifestyle Satisfaction and Orthorexia Nervosa has been graphically represented (Figure 5).

Table 1.4: Correlation Table

		Lifestyle Satisfaction	Orthorexia Nervosa	Self-Esteem
1	Lifestyle Satisfaction	1		
2	Orthorexia Nervosa	-0.052**	1	
3	Self-Esteem	.398*	-0.17**	1

** Beyond the purpose of this study*
*** insignificant at 0.05 and 0.01 level of significance.*

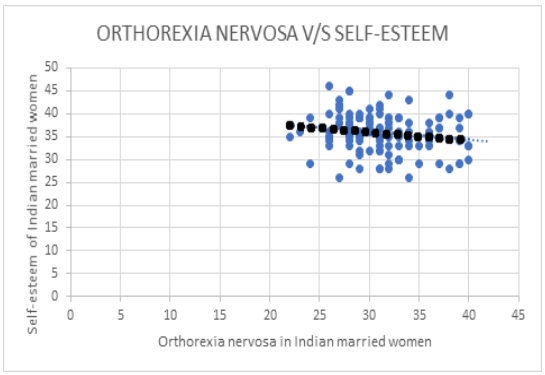

Figure 4: Scatter Graph showing relationship between Self-Esteem and Orthorexia Nervosa.

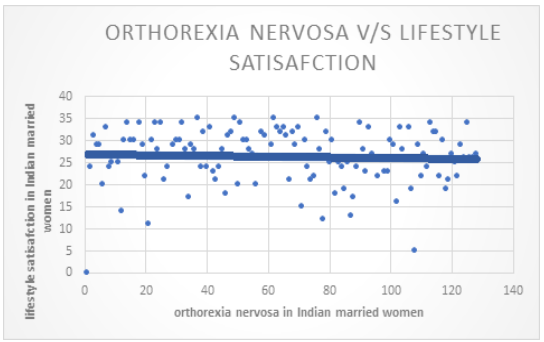

Figure 5: scatter graph showing relationship between lifestyle and orthorexia nervosa

Further to emphasize the nature of relationship established above, A simple linear regression analysis was computed between Orthorexia Nervosa as the independent Variable and Self-esteem and lifestyle satisfaction as dependent variables. As can be seen from the regression table (Table 1.5), for Lifestyle Satisfaction (R square = 0.003), the variability cannot be explained by variability in Orthorexia Nervosa (regressor). Further for Self-Esteem (R square = 0.029), again the variability cannot be explained by variability in Orthorexia Nervosa. Hence no linear relationship has been found between the regressed variables i.e., Self-Esteem and Lifestyle Satisfaction and the regressor i.e., Orthorexia Nervosa.

Table 1.5: Regression table

	β	**R Square**	**SE**	**t**	**p**
Lifestyle Satisfaction	-0.052	0.0003	0.121	-0.583	0.561
Self-Esteem	-0.17	0.0029	0.048	-1.932	0.056

Independent Variable (Regressor): Orthorexia Nervosa

Talking about self-esteem and lifestyle together in the context of marriage in women, Hasnain, Ansari & Sethi (2011) studied the differences in self-esteem and life satisfaction levels in married versus unmarried women in the working versus non-working category. A sample of 80 women was taken out of which 40 were working and 40 were not. Further out of them 20 were married and 20 were not (from each category). The results showed higher life satisfaction and low self-esteem in working women than non-working women. Moreover, no significant differences were found between the self-esteem and lifestyle satisfaction of married versus unmarried women negating the role of marriage in changing levels of these psycho-social factors.

This study was done in an Indian account to compensate for the sheer lack of exploration of orthorexia nervosa in India and among Indian women. Considering the high prevalence of this eating disorder in women from other countries, it is not surprising to see a high prevalence in Indian women too. Moreover, having seen the positive role of marriage in the onset and maintenance of abnormal eating behavior, the sample of Married women from India, showing a high prevalence of orthorexia nervosa, confirms the role further. Lastly, since no correlation was found of self-esteem and lifestyle satisfaction with orthorexia nervosa, it can be due on the lack of association of self-esteem with nutrition and quality and rather weight concerns and body image which is anyway beyond the scope of orthorexia nervosa.

CONCLUSION

There is a high prevalence of Orthorexia Nervosa in Indian married women. There is no linear relationship between self-esteem and orthorexia nervosa in Indian married women. Along similar lines there is no direct or linear relationship between lifestyle satisfaction and orthorexia nervosa in Indian married women. This is to say, the variability in self-esteem and lifestyle satisfaction in the sample of Indian married women cannot be justified through variability in orthorexic tendencies prevalent in the sample group.

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Conflict of Interest

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