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THE PSYCHOSOCIAL ASPECTS OF FOOD CHOICES AND DIETARY INTAKE OF ADOLESCENTS: A REVIEW

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In order to understand eating behaviour of adolescents, insight into determinants of intake is necessary. The development of effective strategies aimed at healthy lifestyle practices is thought to be hampered by the lack of understanding of which behavioral and environmental factors need to be modified. We conducted a review of the literature for potential psychosocial determinants of food intake in adolescents. RelevantPapers were identified from PubMed, Science Direct, Google Scholar, NCBI and Medline by using all combinations of the search terms: "psychosocial aspects, dietary intake, obesity, underweight or adolescents". Research studies examining psychosocial determinants of food intake among adolescents were included in the review process. Based on inclusion-exclusion criteria full text papers were reviewed. A large number of potential determinants have been studied among children and adolescents. However, for many presumed determinants convincing evidence is lacking, mostly because of paucity of studies. The determinants best supported by evidence are: familial environment, body image perception, eating behaviour of the adolescent, locus of control, behavioural and temperamental associations with food intake. Other important factors like gender, socio-economic status, peer group, individual preferences, parental intake, and home availability/accessibility also have a profound impact on an adolescent's food intake and are positively associated with intake. The determinants most consistently supported by evidence are familial environment, body image perception, eating behaviour of the adolescent, locus of control, behavioural and temperamental associations with food intake. There is a need for internationally comparative, longitudinal, theory-based and multi-level studies taking both personal and environmental factors into account.

Keywords: Psychosocial factors, Adolescents, Food intake

INTRODUCTION

Eating habits formed during childhood can persist into adulthood (Lien *et al.*, 2001) and can prevent or delay premature onset of a number of chronic diseases. Children prefer foods to which they have been previously exposed.Children's food choices are also shaped by individual, societal and cultural factors. Some of these factors are endogenous to the individual child, but others are environmental.

The latter include the foods made available to children inside and outside the home and the modelling of food behaviours by caregivers, especially parents. Studies show that current eating environment in developed countries fosters food preferences and food selections inconsistent

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with healthy dietary guidelines, thus promoting excess weight gain and obesity (St-Onge *et al.*, 2003). In general, adolescents in most countries have three main meals (Cruz, 2000). Owing to urbanization and the change of lifestyle, the meal patterns of adolescents have their own characteristics. Breakfast skipping, dieting and snacking are important health problems of adolescents worldwide (Cruz, 2000; Rolland-Cachera *et al.*, 2000; and Samuelson, 2000), and they are found to be associated with overweight/ obesity (Berkey *et al.*, 2003).

Studies from several countries show that children's food habits and meal patterns are associated with family socioeconomic status (SES) (Samuelson, 2000). In developed countries, irregular meal patterns as well as snack consumption are common, especially among girls in areas with low SES, while adolescents with a higher socio-economic level tend to show a higher consumption of vegetables, fruits and high fibre foods and a lower consumption of meat, meat products and fats than their counterparts from a lower socio-economic level (Samuelson, 2000; and Wardle *et al.*, 2003).

Many different factors influence food habits in a complex interactive way. Parents and the family environment are very important for young children to learn and develop food preferences and eating habits in a dual way (Story *et al.*, 2002). On the one hand as providers of the food children eat, family members are also relevant role models and establish rules and norms related to food and eating practices. As children grow and start school, teachers, peers and other people at school together with the media and social leaders become more important. Progressively children are more independent and start making their own food choices. The peer group is key for adolescents and has a major influence in developing food habits and lifestyles.

Different models and theories have been suggested to explain interactions among influencing factors on food habits (Story *et al.*, 2002). Availability and access to a variety of foods have been identified as key elements in this context together with psychological processes at individual and social levels and other factors that influence food choices.

However, availability and access to food are influenced by a number of other situations; among them socioeconomical aspects and prevailing lifestyles. To develop effective dietary interventions for children and adolescents, it is necessary to understand the factors that determine eating behavior in these populations.

Research has repeatedly shown that theory-based interventions that are guided by relevant behavioral theories are more likely to significantly impact dietary behaviors in youth.Theory-based research is fundamental to the understanding of health behaviors by providing a framework by which to examine the relationships among constructs, to assess the impact of the various constructs, and to delineate factors and determinants to be studied. Based on constructs from various review papers a conceptual framework of individual and environmental predictors of food intake was developed (Figure 1).

While there is some evidence that food choice is associated with body composition, the association between food choice and obesity amongst adolescents, in particular, is less clear. While the relationship between obesity and food choice is not straight forward, this lack of a consistent association may be because most previous work investigating obesity and food choice in adolescents has focused on single foods or food groups.

Dietary patterns have been proposed as a solution to investigating the association between food choice and body composition as these analyses allow for the entire diet to be examined in combination, rather than focusing on intakes of single nutrients or food groups (Newby, 2007).

The current review represents an updated comprehensive review of psychosocial and environmental factors affecting the food choices and dietary patterns of adolescents.

Figure 1: Conceptual Framework Describing the Environmental Correlates of Food Intake in Adolescents

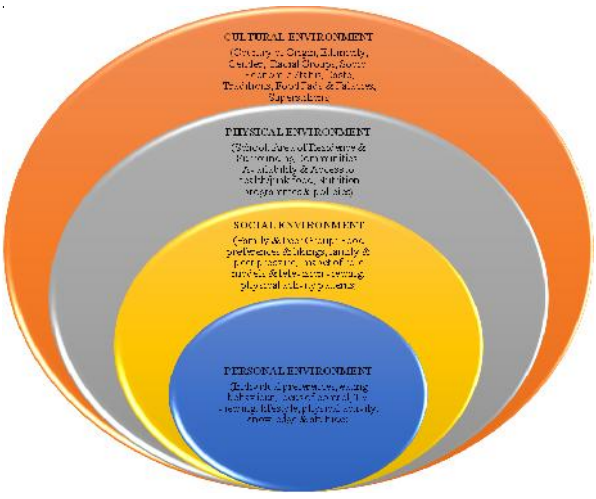
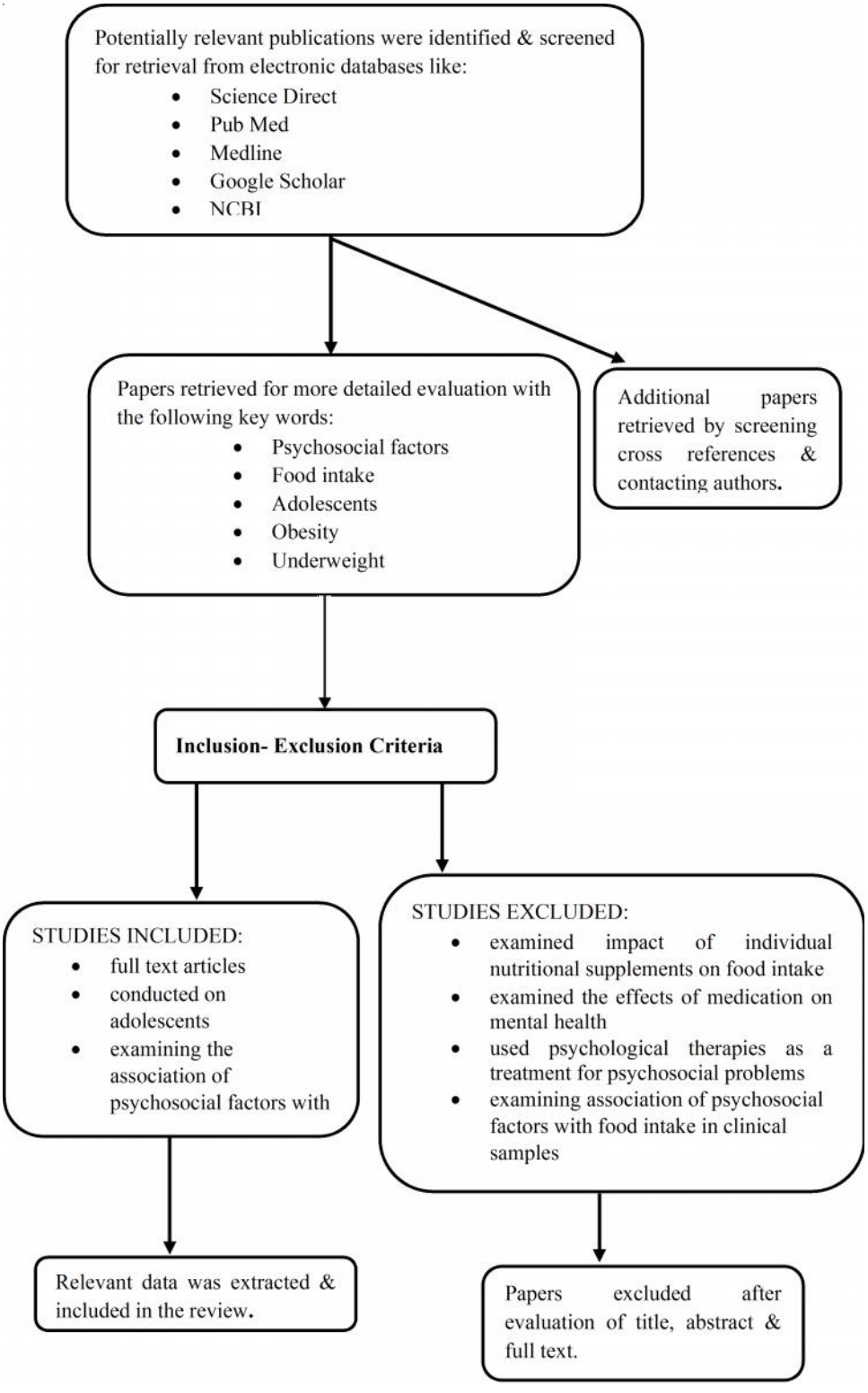


Figure 2: Flowchart of Study Selection Process



METHODOLOGY

Relevant articles were identified by searching the PubMed, Science Direct, Google Scholar, NCBI and Medline databases. Research articles published between January 2000 and January 2014 which included cross-sectional, behavioural and longitudinal studies were selected. Key words such as "Food intake", "adolescents", "psychosocial aspects", "dietary intake", "obesity" and "underweight" were used in search strategy (Figure 2).

Inclusion – Exclusion Criteria

Studies considered for inclusion in this review (1) were full-text articles; (2) published in English; (3) conducted on adolescents; (4) examined association between psychosocial aspects; (5) used nonclinical study samples that were population based rather than from acute or institutional settings. We excluded studies that:

- Examined impact of individual nutritional supplements on food intake;
- Examined the effects of medication on mental health;
- Used psychological therapies as a treatment for psychosocial problems;
- Were published in languages other than English.

RESULTS AND CONCLUSION

A number of potential psycho-social determinants influencing the food choices and eating behaviour of adolescents have been studied. However, for many presumed determinants convincing evidence is lacking, mostly because of paucity of data. The determinants best supported by evidence are: familial environment, body image perception, eating behaviour of the adolescent, locus of control, behaviour and temperament. Socio-economic status, individual preferences, parental intake & home availability/ accessibility are also positively associated with food intake. Table 1 summarises associations between potential psychosocial determinants of food intake in adolescents with the conceptual framework of environmental correlates. The determinants were grouped into socio-demographic factors, personal factors, family-related factors, friends-related factors, school-related factors, meal patterns, TV watching, and eating fast food.

The Familial Environment

The family environment offers several opportunities which influence the dietary habits and choices of adolescents. Research suggest that parenting style may play an important role in relation to adolescent's weight and dietary intake (Berge *et al.*, 2009).

Specifically, there is evidence suggesting that parenting style is associated with adolescent overweight, dietary intake and physical exercise (Kremers *et al.*, 2002). The four classic parenting styles are: authoritative, authoritarian, permissive, and neglectful (Parenting style typologies are based on two dimensions: (a) the degree of responsiveness and (b) the degree of demandingness of the parent. Responsiveness is the extent to which a parent fosters individuality, self-regulation, and self assertion in their child by being attuned and supportive of their child's needs and demands (Maccoby, 2000) Whereas, demandingness is the extent to which parents cultivate self-control and responsibility in their child through parental supervision, rules/structure and disciplinary efforts (Maccoby, 2000). An authoritative parent balances high levels of responsiveness with high levels of demandingness. An authoritarian parent exhibits low levels of responsiveness and high levels of demandingness. A permissive parent expresses high levels of responsiveness and low levels of demandingness. A neglectful parent exhibits low levels of both responsiveness and demandingness. Thus, an authoritative parenting style provides the structure and support needed for children to internalize and maintain positive behaviors, whereas, authoritarian, permissive and neglectful parenting styles may interfere with children's ability to learn self regulation, including regulation of eating (Gable and Lutz, 2000; and Arredondo *et al.*, 2006). Several cross-sectional studies have found an association between authoritative parenting style (high responsiveness, high demandingness) and lower youth BMI, more frequent physical activity and healthy dietary intake (and one longitudinal study found that children of authoritarian parents (high demandingness, low responsiveness) had almost a fivefold increase in odds of being overweight (Rhee *et al.*, 2006).

Studies also suggest that parents' own television use (Jago *et al.*, 2010) and dietary intake (Pearson *et al.*, 2008) are associated with adolescents' behavior, although studies examining relationships between parents' physical activity habits and adolescents' activity have produced inconsistent results (Jago *et al.*, 2010). Family meals have also emerged as an important factor in the family environment with adolescents whose families frequently eat meals together reporting better dietary intake (Neumark-Sztainer *et al.*,

2003). Finally, studies suggest that physical resources in the home such as the number of televisions (Roemmich *et al.*, 2007), having a television in youths' bedrooms (Barr-Anderson *et al.*, 2008), and having healthy or unhealthy food available in the home (Ezendam *et al.*, 2010) contribute to adolescents' behavior.

Few studies have examined the family environment and its relationship with adolescents' weight-related behaviors among racially and ethnically diverse or lower SES adolescents within the United States, the youth who are most at risk for overweight and obesity. Also, few studies have assessed novel factors in adolescents' family environments such as the presence of physical activity equipment and media resources (Dowda *et al.*, 2007). Finally, the majority of studies of the family environment utilize adolescents' report of their parents' behavior and home resources (Ferreira *et al.*, 2007).

Some interesting findings where reported from the study titled "Familial correlates of adolescent girls' physical activity, television use, dietary intake, weight, and body composition". In the above mentioned study the researcher reported associations between the family environment and girls behavioral outcome and associations between the family environment and girls' BMI and percent body fat. Few associations were observed between the family environment factors and girls' BMI and body composition; however, the number of media resources in the home was positively associated with both girls' BMI and percent body fat (Bauer *et al.*, 2011).

Body Image Perception

The prevalence of overweight and obesity among adolescents is rising rapidly in many countries around the world (Lobstein *et al.*, 2004). Parallel to the rise in obesity, there is an increase in body dissatisfaction among adolescents (Neumark-Sztainer *et al.*, 2003). Previous studies have found that body dissatisfaction is a strong predictor of unhealthy weight control practices (Hanson *et al.*, 2006; and Barr-Anderson *et al.*, 2008), and restrictive dieting and unhealthy or extreme weight control methods are frequently used by adolescents attempting to achieve an internalized image of ideal body (Krowchuk DP *et al.*, 1998). Longitudinal studies have indicated that dieting also predicts weight gain and obesity (Field *et al.*, 2003). Furthermore, weight control behavior is associated with a wide range of health risk behaviors and psychological problems (Field *et al.*, 2003). Thus, frequent weight control associated with poor body image can lead to significant health risks or has potentially serious medical and social consequences. Psychologists define adolescence as a critical period with respect to psychological development of self-image. The association between self-image and mental health is particularly important, since during this period these newly developed cognitive abilities facilitate self-reflection (O'Dea *et al.*, 2006). Sociocultural theories of body image and empirical research pertinent to them suggest that unrealistic cultural standards of beauty contribute to adolescents' body dissatisfaction (Bacchini *et al.*, 2003; and Morrison *et al.*, 2004). Body dissatisfaction has serious physical and psychological consequences, so further study is needed on cultural and sex differences in these attitudes. 10-year longitudinal, population-based study, with 1,902 participants from diverse ethnic/racial and socioeconomic backgrounds in the Minneapolis/St. Paul metropolitan area, examined changes in body dissatisfaction from adolescence to young adulthood. Results revealed that: (a) female and male participants' body dissatisfaction increased between middle and high school, (b) body dissatisfaction increased further during the transition to young adulthood, and (c) this increase was associated with an increase in BMI over time, such that the upward trend in body dissatisfaction became non-significant when BMI was controlled. These results highlight a trend in which diverse female and male youth are increasingly dissatisfied with their bodies as their BMI increases from middle school to young adulthood, and emphasize the need for targeted prevention efforts to intervene in this trajectory and mitigate potential harm (Bucchianeri *et al.*, 2013).

An important factor to consider in any examination of body image is BMI, as one's weight status provides a dynamic physical marker which an individual may use to form and develop self-appraisals over time. Whereas evidence seems to point to BMI as a consistent predictor of girls' body dissatisfaction (Barker and Galambos, 2003; and Lawler and Nixon, 2011), results of several studies suggest that BMI also predicts boys' body dissatisfaction (Field *et al.*, 2001; and Lawler and Nixon, 2011). However, in one longitudinal study of adolescent boys and girls, the BMI body dissatisfaction relationship did not bear out among either group (Bearman *et al.*, 2006). Asian and Black females' body dissatisfaction increased at a greater rate than that of white and other race females—an effect that was reduced but not eliminated when BMI was adjusted. It may be that, over time, cultural messages regarding weight and shape

Table 1: Summary of Potential Psychosocial Determinants of Food Intake in Adolescents and there Association with Conceptual Framework of Environmental Correlates

Potential Psychosocial Determinants of Food Intake in Adolescents	Category of Environmental Correlates
Socio-Demographic Factors	
• Age	Cultural Environment
• Ethnicity	
• Gender	
• Country of Differences	
• Racial Differences	
• Urbanisation	
Personal Factors	
• Preferences	Personal Environment
• Nutritional knowledge	
• Intentions	
• Likes/Dislikes	
• Locus of control	
• Sedentary lifestyle	
• Physical activity pattern	
• Exposure to new foods	
• Stress	
• Alcohol consumption & smoking	
• Spirituality	
• Body image perception	
• Evaluation of own health	
• Preconceived notions	
• Role models	
Family Related Factors	
• Type of family	Social & Physical Environment
• No. of family members	
• No. of siblings	
• Place of residence	
• Meal pattern	
• Meal timings	
• Family cohesiveness	
• Parenting style	
• Family adaptation	
• Family communication	
• Family norms	
• No. of hours spent with parents	
• Buying decision	
• Eating out behaviour	
• Parental smoking	
• Parental alcohol consumption	
• Parent's physical activity	
• TV viewing	
• Total expenditure on food	

Table 1 (Cont.)

Friends Related Factors	
• Preferences	Social & Physical Environment
• Nutritional knowledge	
• Intentions	
• Likes/Dislikes	
• Place of residence	
• Eating out behaviour	
• Locus of control	
• Sedentary lifestyle	
• Physical activity pattern	
• Exposure to new foods	
• Stress	
• Alcohol consumption & smoking	
• Spirituality	
• Body image perception	
• Evaluation of own health	
• Preconceived notions	
• Role models	
School Related Factors	
• Accessibility to canteen	Physical & Social Environment
• Availability of the type of food	
• Lunch source	
• School norms	
• Nutrition education	
• School size	
• School location	
• Peer group & pressure	
• Influence of the teacher	
• Antisocial behaviour	
Meal Timings and Eating Fast Foods	
• Having regular meals during school/ coaching/home	Cultural, Physical, Social & Personal Environment
• Watching TV while eating food	
• Snacking in school/coaching/home	
• Eating out with friends	
• Skipping meals	
• Computer use	
• Reading/Doing homework	

become more salient for members of some groups and/or more difficult to achieve. Another possibility is that, as young women move across key transitional periods in their development, racial/ethnic differences in availability of and access to opportunities for non-body related self-appraisals and self-efficacy building become more pronounced.

Eating Behaviour of the Adolescent

Eating behaviors influence energy intake through choices about when and where to eat, and the types and amounts of

foods chosen, including decisions about starting and stopping eating (Blundell *et al.*, 2005). Individual differences in eating behaviors have been captured using several different independently developed measures and underlying conceptualizations, including food responsiveness, food enjoyment (Wardle *et al.*, 2001), satiety responsiveness (Wardle *et al.*, 2001), eating in the absence of hunger (Birch *et al.*, 2003), reinforcing value of food (Epstein and Saelens, 2000), and the capacity to voluntarily inhibit eating. Dispositions toward impulsivity and self-control have also been empirically linked with eating behaviors and weight gain (Francis and Sussman, 2009). Dietary behaviors have a significant impact on health and well being (Sugiyama *et al.*, 2007). As previous research shows, there is a significant link between adolescent's self -rated health and the quality of their dietary intake (Goodwin *et al.*, 2006). Unhealthy eating behaviour as a health-risk behaviour may include: eating small amounts of vegetables and fruits, eating foods that are high in calories or over-processed (e.g., fast foods), dieting or binge eating and skipping main meals (McKinley *et al.*, 2005). In the background of these activities, poor diet control is a key element. This suggest that due to long term unbeneficial health consequences of unhealthy eating habit, we would gain a deeper understanding into individual and environmental influences of adolescent's poor diet control.

Disturbed eating attitudes and behaviors are more common among overweight than healthy weight youth (Neumark-Sztainer *et al.*, 2002; and Tanofsky-Kraff *et al.*, 2004). The increased prevalence of overweight among youth (Ogden *et al.*, 2006), and findings that disordered eating patterns, including binge eating and self-reported dieting, prospectively predict excessive weight and fat gain among children and adolescents (Field *et al.*, 2003; and Tanofsky-Kraff *et al.*, 2006), underscore the importance of identifying measures that assess eating pathology in overweight youth.

Locus of Control

One psychological construct that may be affected by culture and be particularly useful in accounting for individual for individual differences in ability to adopt and employ health behaviours is Locus of Control (LOC). whether an individual is healthy or not is closely related with his or her personal perspective about health, that is to say, the belief regarding whether being healthy is in his/her own hands. The concept of Health Locus of Control (HLOC) indicates the personal belief of an individual about two or what affects his/her health. Chronologically, the concept of LOC was defined from Rotter's (1966) early work based on Social Learning Theory (SLT). According to Rotter's theory, an individual's expectancy of an outcome will predict behaviour in a given circumstance. Through the learning process, people believe that some of the consequences about their life are the results either of their own actions (internal) or some powerful others (external). Individuals with an internal LOC have the expectancy that their behaviours affect outcomes. The first scale for HLOC developed by Rotter was entitled of 'Scale for Internal ('I') and External ('E') Locus of Control. Rotter hypothesized that those who have strong beliefs of self – control on their own fates: (a) are more aware of environmental factors likely to affect their future behaviours; (b) may strive for the development of environmental conditions; (c) may accept it as more valuable to improve skills and (d) have a stronger tendency to resist adherence and interventions that may affect their behaviours. Researchers also suggest that there is a negative correlation between Internal Health Locus of Control (I-HLOC) and risky health behaviours. By contrast, the correlation between Chance/Fate Health Locus of Control (C-HLOC) is claimed as positive. "Powerful others" (external) Health Locus of Control (E-HLOC) is predicted to have either negative or complex correlations with health behaviours (Akkose and Tabak, 2005). The relationships between health knowledge, health locus of control and health status have been addressed in various models in health education literature. In a survey Tabak *et al.* (2010), reported a positive association between the relatively higher C-HLOC and risky dietary behaviours (e.g., unhealthy nutrition habits) of adolescents. They also defined a positive relationship between I-HLOC and milk drinking behaviour. the result also indicated that those who consumed salad, vegetable and carrots have relatively higher E-HLOC; which explains the adaptive approach of adolescents to the healthy nutrition behaviours recommended or imposed by "powerful others" such as parents and role models.

Association of Behaviour, Temperament and Food Intake

Examining the factors that influence children's eating behaviors is an important priority given the prevalence of childhood obesity. One factor which might be associated with young children's eating behaviours is their temperament. Temperament has been defined as "personal characteristics that are biologically based, are evident from birth onwards, are consistent across situations and have some degree of stability" (Schaffer, 2006). Differences in

individual's temperament may determine why some children, but not others, are at risk of overweight or feeding practices, why certain children have better emotional relationships with food than others, and why parents use parents use particular feeding practices with their children.

Temperament traits have also been related to obesity and overweight in children and to disordered eating attitudes and behaviors in infants, adolescents and adults. For instance, children's emotional temperament has been implicated in the development of overweight, having been shown to mediate the relationship between child and parent overweight (Agras *et al.*, 2004).

The study of temperament as a predictor of weight holds strong importance when considering that such a relationship could lead to a lifelong predictor of and, therefore, a screening tool for the prediction of overweight and obesity from early childhood. Researchers have suggested some linkages between infant and childhood temperament and weight and/ or later weight gain in infancy (Davis, 2007), childhood (Anzman and Birch, 2009), and adulthood (Pulkki-Rsback *et al.*, 2005).

In older children Agras *et al.* (2004) found that at 5 years of age temperament mediated the relationship between parent overweight and child overweight,as measured by BMI, with children highly emotional in temperament being more likely to be overweight at 9.5 years of age than children without this temperamental profile (Agras *et al.*, 2004). Further support for a relationship between early temperament and later weight is reported in Pulkki-Raback *et al.* (2005) who reported temperament at 6 to 12 years of age to relate Body-Mass Index (BMI) at ages 24 to 30. Specifically, high emotionality in childhood predicted increased BMI in adulthood.

Factors such as personal issues, family and peer pressure significantly affect food choices among adolescents. Therefore, it is suggested that if programs to improve adolescent nutrition are to be effective, they need to address a broad range of factors, in particular environmental factors (e.g., the increased availability and promotion of appealing, convenient foods within homes, schools and restaurants).

DISCUSSIONS

The purpose of the present review was to compile evidence regarding the psychosocial determinants of food intake in adolescents. This review reveals that the determinants supported by the greatest amount of evidence are family structure and environment, body image perception, locus of control, eating behaviour of the adolescent, behaviour and temperamental effects on food intake.

Childhood and adolescent obesity is on the rise in both industrialized and developing countries. The investigation of the psychological aspects of food choices and dietary intake has been the focus of long standing theoretical and empirical endeavour. Overweight in children and adolescents is associated with a host of psychological and social problems such as reduced school and social performance, less favourable quality of life, societal victimization and peer testing, lower self and self-esteem, and neuropsychological dsyfunctioning. As this review pointed out, some of these determinants which are crucial for the understanding food choices and food intake in adolescents, the focus should be on those determinants which are considered modifiable as they make up the majority of predictors established.

Many environmental and social factors have been shown to correlate with childhood obesity and food intake, and researchers are attempting to use this knowledge to help prevent and treat the condition. When implemented early, certain forms of behavioural and psychological treatment can help children regain or maintain a healthy weight and modify their dietary practices.

Additionally, if trends are found to be more prevalent among some groups of children and adolescents, it may be beneficial to designate resources appropriately to those group. Developing far-reaching, population-level interventions and public health policies to prevent adolescent obesity is critical. This will necessitate a multifaceted approach, which involves a collaboration of all levels of society and environment.

There is paucity of data in this regard in Indian literature. Hence, the influence of psychological factors on food choices and dietary intake among Indian children is not well known from the research studies. Future research should focus on a broad and comprehensive scope, in order not to exclude important components of psychosocial relevance. Introduction of new comprehensive models should be accompanied by multilevel analytical approaches from which conclusions can be drawn. There is a need of theory – based multi level studies in which both personal and environmental factors (family, school, local community, etc.) are considered and compared internationally. Such future research will generate more information on psychosocial

determinants and mediators of dietary intake among adolescents on which future course of interventions can be tailored.

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