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PSYCHOLOGICAL AND BEHAVIOURAL INTERVENTIONS TO PROMOTE HEALTHY EATING AMONG YOUNG ADULTS: A SYSTEMATIC REVIEW

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Abstract: Eating behaviour is one of the most common human behaviours, yet its research has been limited, even though it impacts one's overall well-being. Youths are more likely to consume packaged and processed foods. The intake of packaged and processed food by the young adults is closely associated with obesity and its associated problems, including diabetes, heart disease, and cancer. This review paper presents the most effective psychological and behavioural interventions to be applied to inculcate a healthy eating behaviour among young Indian adults aged 18-30 years. The maze of packaged and processed foods is a journey towards healthy eating that reveals the rich insight of the relationship between the body, the mind and the food that people consume. Regardless of knowledge and capability, many people find it difficult to modify their health-related behaviours because of behavioural patterns, emphasizing the significance of psychological intervention to regulate impulsive behaviours. Overcoming psychological obstacles to healthy eating should be an essential focus for health initiatives since modifying these behaviour patterns might alleviate several global health concerns. This review paper aims to uncover psychological interventions, behaviour change techniques and other strategies that encourage healthier eating habits and lasting food choices among young adults.
Keywords: Behaviour change techniques, Psychological interventions, Healthy eating and Young adults.

1. INTRODUCTION

The diet is vital to the health, wellbeing, growth, and development of a person. Nutritional deficiencies are associated with unhealthy diets. Unhealthy eating habits are a significant contributor to the global disease burden since these habits cause non-communicable diseases, such as cardiovascular diseases, diabetes and cancer (World Health Organisation: WHO, 2019). Extensive change in terms of the traditional diet to a more reliance use of ultra-processed food has occurred. Addressing this concern is essential for making healthy food choices and preventing noncommunicable diseases (Menon et al., 2024). The consumption of highly processed and ready-to-eat items has contributed to rising obesity rates globally and in India (Baker & Friel, 2016). Teenagers and Young adults are the most affected by this transformation in dietary patterns (Sequeira et al., 2014). Ultra-processed foods (UPF) are hyper palatable designed for commercial gain. Such foods contain synthetic additives, preservatives and artificial colours, enhancing its taste and making it visually attractive. The production process of these foods involves frying, freezing and hydrogenation (Fang et al., 2024). Our youth require protection from nutrient-poor and calorie-dense foods which would further lead to their health deterioration. The present review is conducted to gather the latest research on behaviour change techniques, psychological interventions and other strategies regarding promoting healthy eating among young adults and to give further possible directions for future improvement.

1.1 Rising consumption of processed and packaged foods in India

In India, the consumption of foods high in fat, sugar, and salt has increased, raising the risk of diet-related non-communicable diseases (Mediratta and Mathur, 2023). Diets changing from minimally processed staple foods (such pulses and whole grains) which are high in vitamins, minerals, and fiber to refined, processed, and ultra-processed foods (UPFs) are indicators of the rapidly evolving food environment. From USD 0.9 billion in 2006 to USD 37.9 billion in 2019, UPF sales statistics in India shows an exponential rise (World Health Organization, Country Office for India; 2023). The consumption of UPFs and HFSS foods is strongly associated with the rise of obesity, type-2 diabetes, and cardiovascular diseases (Gupta, 2024) (Aggarwal et al., 2023). The prevalence of these conditions possess a significant public health concern (Fardet et al., 2022). People who choose processed foods instead of traditional diets experience nutritional deficiencies that result from lower consumption of vital elements including proteins as well as vitamins and minerals (Arya & Dubey, 2024).

1.2 Evolving family dynamics and lifestyles influencing dietary patterns

The changing family lives and structures in India have greatly affected the eating habits and the lifestyles, which have been echoed by the socio-economic and cultural changes. The rapid urbanisation and growth of the economy in India can be seen through the nutrition transition of the country which is characterised by the change in the dietary habits. Food consumption patterns of people in developing countries such as India are driven by the changed family dynamics and lifestyles, increased per capita income etc (Kumar, Anand, 2016). The quality of diet has also declined in urban areas and there is an increased consumption of traditional diets in rural settings. This city-country divide emphasises how the change of lifestyle influences dietary patterns (Paul, 2022). The transition of joint to modified extended families in India influences the selection of foods because family relations and intergenerational relations are important factors in food preferences and consumption habits (Verma et al., 2024). The evolution of tastes between generations has imposed the use of market systems and subsidised food products, which are impacting the dietary variety and quality (Huang et al., 2017).

1.3 Young adults and the increasing trend of unhealthy food consumption

Leaving home to study or work, joining college and marriage are merely but few changes that come with being a Young adult. The food preferences of young adults depend on several distinct and changeable factors such as price, familiarity, emotionality, health, and sensory value (Winpenny, 2018). This makes this group highly vulnerable considering the fact that adolescent to adulthood transition is a period characterised by significant changes in lifestyle and social factors. It is a crucial time of making long-term eating habits (Balhara, 2022). The dietary habits may exacerbate mental health, which leads to the formation of the cycle of unhealthy eating and mental distress (Akhtar et al., 2025).

1.4 Nutrition label and food literacy interventions

There were healthy habits like checking the nutritional labels that worked to help select the food. Interventions on food literacy have also been found useful in promoting healthy eating habits in the persons of diverse socioeconomic statuses (Manna et al., 2024). The Government of India has enacted quite a number of policies and programmes which help to improve the food habits of people and promote the use of nutritious foods. The Food Safety and Standards Authority of India (FSSAI) initiated Eat right India movement in 2018 and advocated safe, healthy, and sustainable food by conducting campaigns on food safety, fostering behavioural change, and reforming the food environment (FSSAI, 2022a). In an attempt to help consumers make informed decisions about the foods they consume, the FSSAI suggested that Front-of-Pack Labelling (FoPL) should be introduced to indicate high-fat, salt, and sugar (HFSS) foods. It was intended to streamline and make nutritional information easier and disincentivize the consumption of unhealthy goods with the help of colour-coded warning labels (FSSAI, 2022b). In order to address malnutrition and healthy eating, the government established the POSHAN Abhiyaan (National Nutrition Mission) in 2018. It is a programme that incorporates a number of ministries and departments into enhancing nutritional outcomes by means of behavioural change, capacity-building, and community mobilisation (NITI Aayog, 2021).

2. METHOD

2.1 Search strategy

A comprehensive literature search was done using four electronic databases, PubMed, Google Scholar, Science Direct and Scopus. This rapid review followed the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA, 2020) guidelines. These guidelines facilitate transparency in the review process and provide the scope of applicability of the literature synthesis. The search strategy involved the following keywords and phrases- (“Behaviour change techniques” OR “Behaviour modification” or “Psychological interventions” AND “Healthy eating” or “Eating behaviours” AND “Young adults”). The search was performed on 13 November 2024, and Studies between 2014 and 2024 were reviewed.

2.2 Eligibility Criteria

The inclusion criteria comprise of (a) Only English language studies from 2014 onwards; (b) Studies focusing on young adults; (c) Primary reports of experimental studies, evaluating the effectiveness of psychological intervention or behavioural interventions to inculcate healthy eating habits. Exclusion criteria consisted of (a) Studies focused on eating disorders; (b) Studies were excluded if any other medical illnesses persisted (c) Population other than young adults were excluded.

2.3 Selection of Studies

The search strategy provides the records identified from (PubMed= 420, 220 on Google Scholar, 250 on Science Direct and 110 on Scopus). The titles and abstracts of identified papers were assessed in relation to our inclusion and exclusion criteria. Full texts were obtained for relevant articles. Figure 1 presents the Prisma flow chart.

PRISMA Flowchart

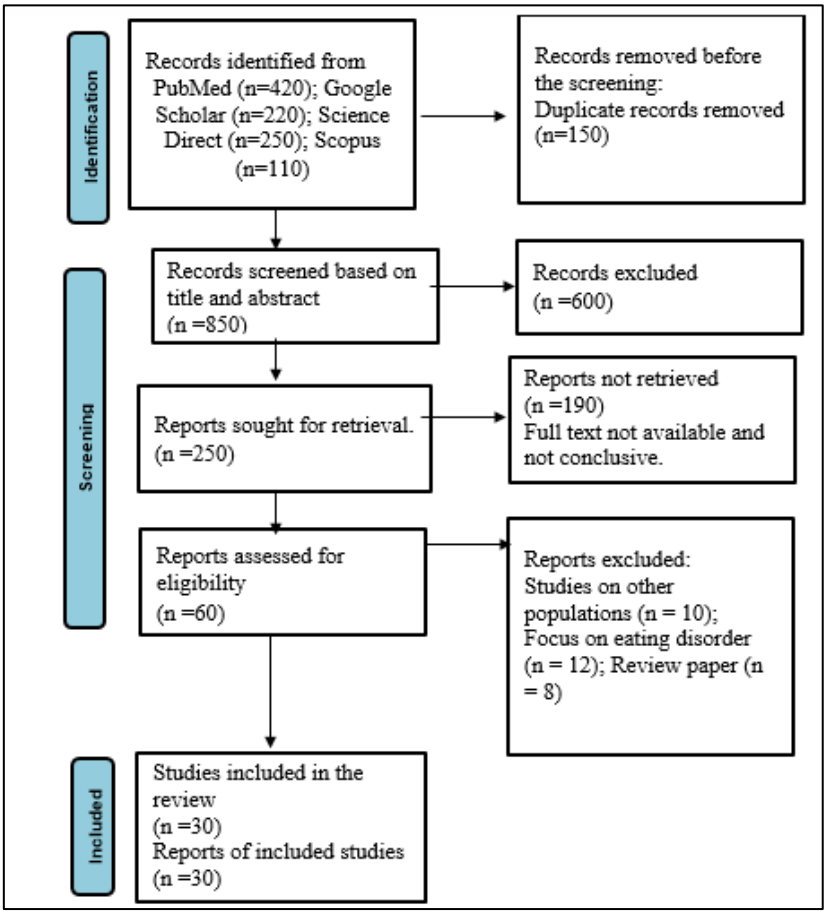

Figure 1: Study selection flowchart

3. DISCUSSION

In the contemporary world, individuals are being exposed to unhealthy, packaged and processed food that is so readily available in our environment. The most affected group of people is the one that comprises young adults currently attending college. The consumption of these food products has led to the increasing levels of obese and overweight population who later embrace the pattern of sedentary lifestyles. Scholars still have minimal knowledge on the approaches they should use to change this kind of behaviour. Studies on the behaviour change strategies that can decrease unhealthy food intake in an environmental context have become a necessity in order to avert this challenge.

The review paper is dedicated to behaviour change techniques in changing unhealthy eating habits and instilling healthy eating behaviours in young adults.

3.1 Effectiveness of Behavioural Nudges and Digital Strategies

The best nudging techniques are making the healthier choices more noticeable or altering the default decision, since they are less obtrusive and people are given a sense of freedom in making their own choice, particularly in higher education institutions such as the university cafeterias. Placing healthy products at eye levels was a good idea (Sunghwan Yi et al., 2022). Social environments usually value unhealthy food more than healthy food products. It has been demonstrated that social acceptance is a major determinant to what individuals eat. Individuals form more positive attitudes towards healthy food when the social value of healthy food is higher that results in them making healthier food choices. Specific social prompts can significantly increase the social attractiveness of nutritious food. Social media and other online platforms will offer an effective, scalable tool of changing eating behaviours (Charry and Tessitore, 2021). Besides dealing with the more common obstacles, such as low motivation and ineffective self-regulation, gamified elements such as badges and visual progress monitors can be useful in enhancing self-monitoring and user engagement. A delivery of motivational content through the use of social media proved to be effective, especially in the context of attractive visuals such as recipes and food photographs (Monica Marina Nour et al., 2017).

3.2 Psychological mechanisms to reshape eating behaviour

Positive psychology concepts such as joy, gratitude, and savouring can be applied to healthy eating to relate low-sugar diets to pleasant experiences and family time. This encourages a positive feedback mechanism which maintains the dietary changes, which encourages the motivation. The focus on the family will create a positive atmosphere and motivate everyone to make healthy eating choices. To find a solution to the problem of global diets, the application of positive psychology in the field of public health can be extremely valuable (Henry et al., 2024). Gratitude interventions regulate emotions by reducing levels of stress and negative emotions that result in

unhealthy eating habits. Feeling thankful will divert attention to external support systems and evoke positive emotions and enhance self-regulation. It is expressed in the broaden-and-build theory, according to which positive emotions boost psychological resources and encourage healthier decisions (Megan et al., 2019). Two psychological methods which can be very effective to reduce impulsive consumption include diet-priming and stop-signal training which help to remove automatic stimuli and encourage self-control. These methods promote more portion control and offer alternatives to address eating patterns and manage overeating (Koningsbruggen et al., 2014).

3.3 Attentional Bias modification and Eating Behaviour

Attentional bias modification promotes eating practices by directing attention to healthy food cues. Educating people on the importance of listening to the cues of healthy foods influences the attentional process and positively influences the healthy foods consumption. Attentional bias may be redirected on positive cues (healthy food) instead of negative cues (unhealthy food). This could be a beneficial and socially acceptable method to foster healthier eating behaviours particularly in settings where unhealthy foods are present as triggers (Kakoschke, N. et al., 2014). The ratio of the healthy foods (such as fruits and nuts) that the participants were to consume when they were trained on the indications of a healthy diet, was greater as opposed to the unhealthy snacks (such as chips and chocolates). Encouraging healthier dietary choices can help individuals respond more positively to healthy food cues and reduce overall unhealthy food intake (Hardman et al. et al., 2013). Attentional bias modification is an effective method of altering dietary behaviour. When the emphasis is turned to cues of healthy food, it starts to promote positive eating behaviours and reduce the impact of the obesogenic environment (Naomi Kakoschke, 2014).

3.4 Implementation intentions drive change

Implementation intentions are “if-then” plans that go a long way in enhancing the consumption of healthy foods because they assist people to overcome the gap between intention and action. Since implementation intentions make complicated objectives manageable into small steps, studies have shown that they assist in initiating health related behaviours. They can lose their efficacy unless reinforced, and their impact can be supported through integrating them with adaptive planning (Harris et al., 2014). Development of comprehensive plans, including implementation intentions, can be used to reduce the intake of fat, especially when catering to more challenging targets. Moreover, it also highlights that it is more effective under less supervision, which means that they can be tailored to fit other populations to produce better results (Vilá et al., 2017)."If I eat lunch, then I will have an apple" is one such example of an strategy with an “if-then” approach, This method can be applied to different populations by creating a mental linkage between the situation and the preferred behaviour(Armitage et al., 2007). Such interventions may be scaled, practical and very useful in ensuring a lasting change in health behaviour through providing strategies that are clear and achievable to people in order to address challenges (Guillaumie et al., 2012).

3.5 Mindfulness as a behavioural intervention

The study was conducted on fifty-one college students in a randomised controlled experiment in Spain to understand the effect of a mindfulness-based intervention on the implementation of healthy lifestyle behaviours. The intervention group also demonstrated significant changes in their eating habits, use of substances, and sleep patterns as compared to the control group. These results demonstrate how Mindfulness can help young adults develop better eating habits and foster healthier behaviours (Soriano-Ayala et al., 2020). Another study was conducted in 2016 on mindful eating among women; the findings indicated that emotional eating had significantly decreased, and how well mindful eating works to encourage better food choices and healthy eating (Fung et al. 2016). Mindfulness alleviates the frustration of suppressing one's craving. Because mindfulness-based interventions promote acceptance rather than suppression, they can be a valuable strategy for regulating food cravings by lowering the automatic drive to consume when cravings arise (Alberts et al., 2010). A five-day study involving 137 college students compared how two mindfulness techniques- cognitive defusion and acceptance-affect their ability to avoid eating chocolate. The cognitive defusion group consumed much less chocolate than the control group. However, there were no significant outcomes from the acceptance technique (Jenkins & Tapper, 2014).

3.6 Integration of Psychological strategies and Behavioural interventions

Several specific behaviour change techniques (BCTS) were identified, such as goal setting, self-monitoring and self-management training to promote healthy eating (Bonnie Spring et al., 2020).

Acceptance and commitment therapy was found to be effective, ACT alters unhealthy eating habits to more intuitive, value-driven practices, resulting in healthier eating patterns. No longer was food used to deal with negative emotions, which enhanced the self-regulating capacity of the participants. Since digital health interventions are now diversifying, one option could be to combine ACT with other strategies to offer a comprehensive approach to the improvement of eating habits (Elina Järvela-Reijonen et al., 2018).

The article “Comparison of Food-Based and Music-Based Regulatory Strategies for (Un) Healthy Eating, Depression, Anxiety and Stress” highlighted important aspects of the regulation of people’s emotions as well as how this influences their eating behaviour & psychological well-being. It was reported that listening to music is a useful mechanism that enhances mood and relieves stress, which potentially will assist individuals to eat healthier since it will eliminate the urge to overeat (Kamila Czepczor-Bernat et al., 2021).

In the other study, EFT was potentially a promising intervention to promote healthier diets. Participants who had been exposed to Emotional Freedom Techniques (EFT) when compared to the control group reported more

frequent eating of healthier foods and less unhealthy eating habits including less junk food and sweetened beverages. (Peta Stapleton et al., 2016).

3.7 Targeting impulsivity and habitual responses to reshape eating behaviours

Inhibitory Control Training (ICT) allows individuals to lessen their automatic reactions to tempting foods, which causes them to lessen their impulsive feeding. People who had high appetites in a study of 50 participants were less likely to select the items that were associated with stop signals as they looked less attractive. Individuals who had low appetites were not affected thus showing that the strategy is most effective when one is already hungry. The results suggest that people can be tempted to resist tempting foods with the help of stop signals (Harm Veling et al., 2013). Effective ways of changing eating habits include inhibitory control or the ability to "stop" something before acting on impulses. Individuals who were low in self-control may consume less by repeatedly associating a stop signal with tempting food, which reduced impulsive eating. This indicates the power of inhibitory control in enabling individuals to navigate through their eating patterns and prevent overeating (Houben, K et al., 2011). The unhealthy foods were less selected especially among individuals with high appetites or regular eaters because stop signals were equated with them. This strategy promoted consumption of healthier foods with the focus on the potential to minimise impulsive eating (Harm Veling et al., 2012). A second study on 119 undergraduate participants in Pennsylvania has shown that ICT is not as useful in decreasing the consumption of snacks among students with high emotional eating; it only was beneficial among those with low emotional eating patterns (Forman et al., 2016).

3.8 Leveraging technology to promote healthy eating behaviours

In a study at the University of Zurich consisting 203 participants, majority being students, WhatsApp support groups provided an avenue through which participants could interact daily, where they could share their instances, experiences as well as offer support and motivation towards meeting their health eating goals. Improvement in eating habits was observed, and digital tools such as WhatsApp led to increasing familiarity and confidence within the groups over time (Jennifer Inauen et al., 2017). In another research involving 154 undergraduate students at Boston University, the researchers evaluated the effectiveness of short web-based interventions to enhance the healthy eating habit of students with and without supplementary SMS (text messaging). The primary objective focused on evaluating the effectiveness of these strategies in assisting students towards better food choices and fulfilling fruit and vegetable intake recommendations. The implementation of daily SMS messages aligned with the participant's daily schedules also. When compared to the Assessment Only (AO) control group, the combined Web-Based Intervention with Messaging (WB+M) boosted the likelihood of achieving vegetable intake criteria up to 37% of participants (O'Brien, L.M. et al., 2016). The findings indicate digital resources as effective tools for promoting healthy eating behaviours. The outcomes prove promising yet the sustained implementation of habit reinforcement methods becomes vital for ensuring lasting results.

3.9 Cognitive strategies: Reshaping thoughts to manage eating behaviours

In a 2012 study conducted in Australia, Cognitive restructuring and cognitive defusion were used to cope with food cravings, specifically to reduce chocolate consumption. Compared to cognitive restructuring, those who used cognitive defusion (CD) were considerably more likely to abstain from eating chocolate (81.1%). By creating psychological distance from thoughts, CD enabled participants to notice urges without acting upon them.CR aimed to challenge and replace unhelpful thoughts with more rational and helpful ones to change their content. Whereas both approaches sought to enhance self-regulation of eating behaviours, CR focused on active cognitive modification, whereas CD emphasised acceptance and detachment (Moffitt et al., 2012).

Another study conducted in 2016 compared the effects of Cognitive Behavioursal Therapy (CBT) and Emotional Freedom Techniques (EFT) on food cravings in 83 Australian people who were overweight or obese. With lasting consequences at 6- and 12-month follow-ups, both therapies were equally effective in reducing food cravings, dietary restraint, and responsiveness to food cues. CBT aims to reduce emotional eating, enhance emotional regulation, and recognise and reframe negative eating-related beliefs. To foster a calmer reaction to triggers, EFT integrated acupoint tapping to reduce emotional distress and its link to food cravings. Participants' reliance on food as a coping strategy decreased due to the effectiveness of both therapies in managing emotional eating (Stapleton et al., 2016).

4. RESULT

S.no.	Technique	Author Name	Study Design	Findings
1.	Positive Healthy Eating(PHE) intervention	Henry CY Ho et al., 2024	Cluster randomized controlled trial	Lowered sugar intake, improved family interaction, and fostered low-sugar eating habits.
2.	Gratitude based-writing activity	Megan M. Fritz et al.,2019	Experimental study	Encouraged young adults to adopt healthier eati ng habits through behaviour change motivated by gratitude
3.	Stop-signal training and Diet-Prime	Van Koningsbru-	Comparative intervention study in a	Decreased self-selected portion sizes of sweets, leading to reduced impulsive eating habits

	implementation intentions	ggen, G. M., 2013	controlled environment	
4.	Attentional bias training	Hardman et al., 2013	Experimental study	No effect on hunger or food consumption
5.	Attentional bias modification	Kakoschke et al., 2014	Randomized assignment of participants	Trained attention to healthy food cues, promoting healthy eating habits
6.	Self-affirmation and implementation intentions	Harris et al., 2014	Randomized factorial design	Increased intake of fruits and vegetables through a combination
7.	Implementation intentions	Vila et al., 2017	Meta-analysis	Effective at limiting fat intake
8.	Implementation intentions intervention	Armitage, (2007).	Randomized controlled trial	Fruit intake increased among participants who formed implementation intentions.
9.	Self-efficacy and implementation intentions	Guillaumie et al., 2010	Self-efficacy and implementation intentions	They consumed more fruits and vegetables, and their behaviour was altered by self-efficacy.
10.	Flow meditation	Soriano-Ayala et al., 2020	Controlled trial with mindfulness intervention	Improved food choices and healthy habits.
11.	Mindful eating	Fung et al., 2020	Review and expand the model	Eating habits are linked to mindfulness in order to promote resilience and health.
12.	Cognitive defusion vs. acceptance	Jenkins & Tapper, (2013).	Experimental study	Acceptance was not as effective as cognitive defusion in preventing chocolate consumption.
13.	Mindfulness-based acceptance training	Alberts et al., 2010	Randomized controlled trial	Significant decrease in food cravings, demonstrating the effectiveness of acceptance-based regulation
14.	Food literacy interventions	Manna et al., 2023	Scoping review	Interventions promoting food literacy enhance eating habits and food-related behaviour, especially for socioeconomically disadvantaged populations.
15.	Acceptance and commitment therapy (ACT)	Järvelä-Reijonen et al., 2018	Randomized controlled trial	ACT improved intuitive eating and reduced uncontrolled eating but showed no significant dietary improvements without nutritional counselling.
16.	Emotional Freedom Techniques (EFT)	Stapleton et al., 2016	Randomized controlled trial	EFT showed promising results in reducing unhealthy eating habits
17.	Choice architecture nudges	Sunghwan Yi et al., 2022	Survey method	Nudging techniques like manipulating the visibility of options promoted the intake of fruits and vegetables
18.	Social media nudges	Charry & Tessitore, 2021	Experimental study	Having a large no. of followers has improved their opinions about healthy eating and promoted healthier choices by serving as social nudges.
19.	Gamification and social media	Nour et al., 2018	Focus groups with young adults	Gamified smartphone apps with visual guides and social media interaction were preferred to boost vegetable intake.
20.	Mindfulness and inhibitory control	Forman et al., 2016	Randomized trial	Although there was no combined impact, Mindfulness and inhibitory control training independently decreased snack consumption on individual levels.

21.	Inhibitory control manipulation	Houben, (2011).	Experimental study	Increased inhibition reduced consumption of high-calorie foods; decreased Impulsivity
22.	Stop signals	Veling et al., 2013	Experimental study	Behavioural stop signals decreased impulsive decision-making for unhealthy snacks.
23.	Smartphone-based support groups	Inauen et al., 2017	Randomized trial	During the intervention, support groups promoted healthy eating, but after the intervention, the effects diminished
24.	Web and SMS interventions	O'Brien & Palfai, (2016).	Randomized trial	A web-based intervention, including SMS reminders, effectively increased university students' daily intake of vegetables.
25.	Cognitive defusion and restructuring	Moffitt et al., 2012	Randomized trial	Cognitive defusion was more effective than restructuring in preventing food cravings.

The review identified several psychological and behavioural interventions to encourage healthier eating among young adults. Nudging strategies and digital strategies were found to be effective.
Gratitude Interventions resulted in better emotional regulation. Diet priming and stop-signal helped in reduction of impulsive intake of processed foods. Attentional bias modification promoted healthy eating habits, Implementation intentions had a significant effect on health-related behaviours. Mindfulness based programmes were also useful in encouraging healthy diet; acceptance and commitment therapy and Emotional Freedom Techniques (EFT) were useful in modifying poor eating habits. The inhibitory control training had a specific reduction on impulsive eating. The use of technology like web-based intervention with a message sending and WhatsApp support groups were used to ensure long-term adherence. The cognitive techniques like Cognitive restructuring and cognitive defusion were useful in managing the food cravings.

5. CONCLUSION

The rising trend of consuming processed and packaged foods in young adults forms one of the most significant concerns. In this review, behaviour change techniques including nudging, inhibitory control training, implementation intentions and other interventions such as mindfulness, gratitude practices, etc. are used to reshape eating habits by addressing the psychological mechanisms such as impulsivity, emotional dysregulation, and habitual responses. These results indicate that the significant dietary change needs interventions that strengthen self-control and align with an individual's emotional and cognitive processes. Further studies should focus on developing culturally adapted intervention programmes that incorporate Indian food culture, family, and socio-economic context to enhance relevance. Additionally, longitudinal evaluations are essential to determine whether the short-term behavioural changes translate into long-term healthy behaviours. By combining psychological insights with digital and community-based interventions, India can facilitate scalable, sustainable systems fostering dietary behaviour change and promoting healthy eating habits among young adults.

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