

Adherence To Short Term Intervention Of Healthy Lifestyle And Factors Associated To Overweight And Obesity

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Abstract

Adherence is the key to get the desired outcome of a healthy lifestyle intervention programme. Adherence to diet and exercise is affected by various factors. The study aimed to assess adherence and reasons for non-adherence to short-term lifestyle intervention among overweight and obese subjects from the Agrawal community. The study sample constituted 90 overweight and obese Agrawal adults, having an equal number of men and women aged 25-60 years. A package of strategy was developed including one hour physical activity and correction in dietary habits. All the study participants were enrolled for life style modification which includes one hour of supervised physical activity, dietary counseling every week and behavioral change. A tool was constructed for evaluating adherence to the lifestyle modification. Results revealed that adherence to exercise and diet was improved after 3 months intervention programme except consumption of figs, walnut, and fenugreek seeds which did not increased. Busy schedule was the key reason for non-adherence to the exercise regimen. Forced eating out, unavailability of healthy food and granting self-permission were the primary reasons for dietary non-adherence. Friend's support was the primary reason for adherence to healthy lifestyle.

Keywords: Adherence, Healthy lifestyle, Overweight, Obesity, Agrawal community.

Introduction

One billion people globally, including one in five women and one in seven men, will be living with obesity by 2030 (Lobstein et al., 2022). Worldwide more than 1.9 billion adults were overweight in 2016. Out of these, more than 34 per cent were obese. Majority of the global population resides in countries where overweight and obesity destroys more people than underweight (WHO, 2021). About 24 % women and 23%, men in India are either overweight or obese (NFHS-5, 2019-21). It is anticipated that cases of overweight will over and above two times in Indian adults from 2010 to 2040, while the cases of obesity will three times by 2040. This

significant increase is expected to be in older ages and this increase is expected to be higher in rural regions compared to the urban counterpart (Luhar et al., 2020). The most prevalent CVD risk factor is overweight/obesity, followed by high cholesterol, and the third most factors is hypertension (Tran et al., 2021).

Obesity is linked with diabetes, cardiovascular disease, obstructive sleep apnea, and cancer; however, a minimum of 5% weight reduction can significantly improve health (Fruh, 2017). Healthy Lifestyle intervention is the best way to manage obesity and reduce the cardiovascular risk factor. Increased consumption of fruits and vegetables, reduced calorie intake and increase in

physical activity helps in reducing weight (Gotthelf et al., 2018). Intervention, including dietary, physical activity and behavioural therapy, helps reduce body weight, fat mass, waist circumference and fasting blood sugar (Sadiya et al., 2016). If morbidly obese subjects undergo intensive lifestyle intervention, they become no longer morbidly obese (Burguera et al., 2015).

Adherence to lifestyle intervention highly affects the outcomes of any lifestyle intervention, and it significantly lowers the risk of all-cause cardiovascular diseases, respiratory problems, and cancer mortality (Zhu et al., 2019). The patient's adherence to intervention is crucial in realizing optimal achievement in cardiovascular health with ascertaining the most applicable treatment régime for an individual with or at high risk of CVD. Non-adherence not only reduces the effectiveness of intervention and increases the risk of cardiovascular events (Nelson et al., 2006), it can also deteriorate patient's quality of life and, at the wider level, result in worse population health consequences and increased health care expenses (WHO, 2003). Unfortunately, poor adherence is common, especially in long-term intervention for asymptomatic conditions like dyslipidemia, high blood pressure and coronary heart disease (Senes and Penm, 2007).

Non-adherence leads to increased risk of cardiovascular events, hospitalization and death (Ho et al., 2007). Therefore helping in adherence to long-term lifestyle modification is an essential part of patient management.

Health care providers can increase adherence by modifying their communications according to the specific patient's awareness, knowledge, thought, beliefs, inclinations, necessities and situations; and upholding motivation by emphasizing intervention's role in decreasing cardiovascular risk (National heart foundation of Australia, 2008).

While the barrier to adherence is multifaceted, effective interventions should not be extremely time-consuming. Using a simple reminder system may be supportive for some patients (Fenerty et al., 2012); arranging follow-up tests (Benner et al., 2004); even short-term counselling can work in improving patient's habits (Phimarn et al., 2017). Self-governing forecasters of adherence to lifestyle modifications are being widow, divorced, secondary school educated, irregular income, having associated health problems, good information about the health problem and good self-awareness (Andualem et al. 2020).

Objectives of the study:

1. To assess the adherence of study participants to short-term lifestyle intervention
2. To study factors affecting adherence to short-term lifestyle intervention

Materials and Methods

Agrawal adults having BMI ≥ 25 residing in Jaipur city were selected from a published study by Dhabariya et al. (2015) on the prevalence of risk factors of diet-related chronic degenerative diseases among the Agrawal community. A list of all adults aged 25-60 years having BMI ≥ 25 was prepared using secondary data. The list was further scrutinized for men, women, and membership of the sub zonal committee of Agrawals (Up Samaj Samiti). Zonal committees having more than 50 adults (25 men and 25 women) with BMI ≥ 25 were approached for their consent and cooperation. The President and Secretary of these zonal committees were contacted and explained the study in detail. Three areas were selected for the intervention program based on exhibited interest and extended cooperation in providing the place and mobilizing the people. Ninety subjects and an equal number of men and women with BMI ≥ 25 were taken as the study sample.

Intervention Package

It was a three-month lifestyle intervention programme. The subjects' adherence to therapy was evaluated with providing most suitable intervention for individuals at risk of CVD. A tool constructed for evaluating adherence to lifestyle modification is categorized into dietary modification, physical activity, and behavioral modification. Experts of the subject scrutinized the tool for content validity.

A package of physical activity was developed by consulting a yoga trainer, physiotherapist and physical activity trainer. Package of moderate to heavy physical activity for one hour included warm-up, stretching exercises, exercises and yoga for improving cardio-respiratory endurance and reducing abdominal obesity. A compact disk showing the procedure of every exercise and duration was developed. Diet counseling for individuals and in the group was done to correct faulty dietary habits and counseling for correction of cultural practices leading to faulty dietary practices was also done. Adherence was assessed every month and categorized as excellent, good, average and poor. Duration of exercise per week, more than or equal to 300 minutes, 225-300 minutes, 150-225 minutes, and less than 150 minutes per week, was considered as excellent, good, average and poor adherence of exercise respectively. Duration of brisk walk for 315-420 minutes, 210-315 minutes, 105-210 minutes, and less than 105 minutes weekly were considered as excellent, good, average and poor adherence respectively.

Addition of salt on top of the dishes never or occasionally was considered as excellent adherence. Salt on top of dishes 2-3 times monthly was considered as good adherence and 2-3 times weekly was considered average adherence. In contrast, daily salt intake on top of dishes was considered poor adherence to avoiding salt on top of dishes. Eating out occasionally or rarely was considered an

excellent adherence to a reduction in eating out. Eating out monthly, fortnightly and weekly were considered good, average and poor adherence. Eating sweets never or occasionally was considered excellent adherence for avoidance of sweets. Eating sweets on a monthly, weekly and daily basis was considered good, average and poor adherence respectively for avoiding sweets. Consumption of fried food occasionally or never, monthly, weekly, or daily was considered excellent, good, average and poor adherence respectively for avoiding sweets. Consumption of junk foods never was considered an excellent adherence.

In contrast, occasional, monthly and weekly consumption of junk food is considered good by the respondents, average and poor adherence for avoiding junk food. Intake of more than five servings of fruits and vegetables per day was considered excellent adherence. Five servings per day were considered good adherence, whereas three to five, less than three servings were considered average and poor adherence for fruits and vegetable consumption.

Consumption of flax seeds daily, weekly, monthly, occasional or never were considered excellent, good, average and poor adherence, respectively. Consumption of soaked almonds daily is considered good adherence, whereas consuming monthly or weekly is considered average and consuming occasional or never is considered poor adherence. Consumption of figs, fenugreek seeds and soya nuggets never or occasional, weekly and daily were considered as poor, average and good adherence to healthy foods.

Results and Discussions

The study group comprised of more than 60 per cent of middle-aged men and women, of whom 75 per cent were graduates, 89 per cent were married, and 75 per cent were involved in either business or administrative work. Forty per

cent of study subjects were living in the joint family whereas nearly 37 per cent were living in the nuclear family, rest 23 per cent were living in the extended family. Merely one per cent of study subjects were using tobacco in their past and no one in the study was a smoker. Merely one per cent of study subjects were consuming pan masala.

Body Mass Index

According to WHO classification, before intervention obese persons were found to be 39 (43%) which reduced to 33 (37%) after a lifestyle intervention program of three months. Table 1 revealed that a significant difference was found between pre and post-intervention body mass indexes. Mean BMI of the participants was 30.2 before intervention, which reduced after intervention. A deviation in mean BMI was 4.76 per cent.

Table 1, Effect of short-term life style modification intervention on Body Mass Index

Classification	BMI Principal cut-off Points (WHO)	Pre (f)		Post (f)		t	P	% deviation
		T (N=90)	%	T (N=90)	%			
Pre-obese/ Overweight	25.00 - 29.99	51	56.67	57	63.33	10.14	0.0001	4.76
Obese class I	30.00 – 34.99	28	31.11	26	2.89			
Obese class II	35.00 - 39.99	8	8.89	5	5.56			
Obese class III	≥40.00	3	3.33	2	2.22			

Physical activity adherence of the participants

One-fourth of the women and all men participating in the study were found very sedentary, and rests of the women were sedentary before intervention. Before intervention, 56 per cent participants were very sedentary which reduced to 40 per cent after intervention. Seven per cent of participants also came into the moderate physical activity level. The exercise regimen was for at least 300 minutes per week to reduce body weight and cardiovascular risk factors. Majority (60%) of the participants were exercising for less than 180 min. per week at baseline while 27% were doing exercise for 180-240 min per week, 12% were doing exercise for 240-300 min. and only one % were performing

exercise for more than 300 min. Adherence to exercise increased due to intervention as 64% participants were performing exercising for 240-300min. and 32% were adhered to exercise for more than 300 min which indicates excellent adherence. Walking is a good cardio exercise. As stated by the Centers for Disease Control and Prevention (2022) walking with velocity of three and half to four miles per hour are considered as brisk walk. In the context of present research 100 steps per minute for participants less than 60 years of age was considered a brisk walk. A systematic brisk walk can support to retain a healthy body weight. It helps in prevention and management of numerous ailments, comprising cardiovascular problems, hypertension and diabetes. The research says walking is the first

step in primary and secondary prevention of cardiovascular maladies (Murtagh et al., 2010). Moderate or brisk walking for 15 minutes daily, or slow walking for half an hour daily, may possibly increase physical activity at the population level. On the other hand, if the particular aim is to spend 100 kcal daily by

walking, the spell should be 60 minutes for slow walking or half an hour for moderate or brisk walking per day or 210 minutes of a brisk walk per week (Morabia and Costanza, 2004). About 70 per cent of study participants did not perform brisk walks as they were performing physical activity of intervention packaged.

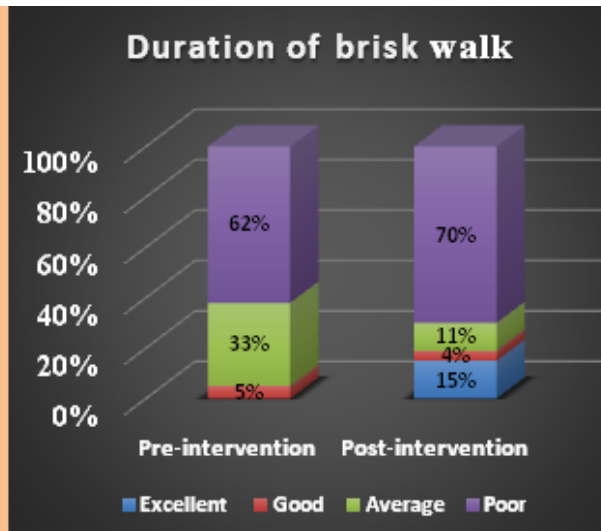
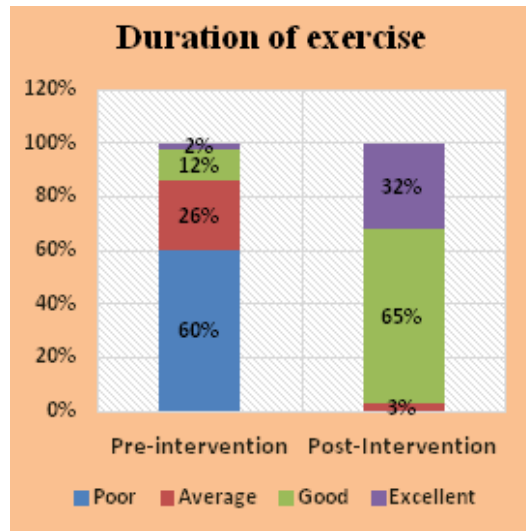


Figure 1. Duration of exercise

Figure 2. Duration of Brisk walk

Adherence to avoidance of unhealthy dietary practices

Almost all the participants were having carbonated/non-carbonated energy-dense beverages and using high fat dairy products at baseline. Almost all the participants avoided having carbonated/non-carbonated energy-dense beverages and practicing the use of low-fat dairy products daily after intervention. Ninety-seven per cent overweight and obese participants practiced adding salt on top of dishes two to three times daily before intervention. After the intervention, more than half of the participants used salt occasionally on the top of dishes. Study

participants were adherent to avoidance of salt on top of dishes. The frequency of eating out at pre intervention stage was 42 and 58 per cent for daily and fortnightly respectively at pre intervention stage. It is clear from Fig 3 that the frequency of eating out was reduced due to intervention. Participants those eating out weekly were reduced to 6% after the intervention. It can be said that participants were adherent to avoidance of eating out. It was revealed that 93% of study participants consumed sweets daily before the intervention, while post-intervention, the percentage of respondents eating sweets daily reduced to 5 per cent. Good adherence was found related to avoidance of sweet intake.

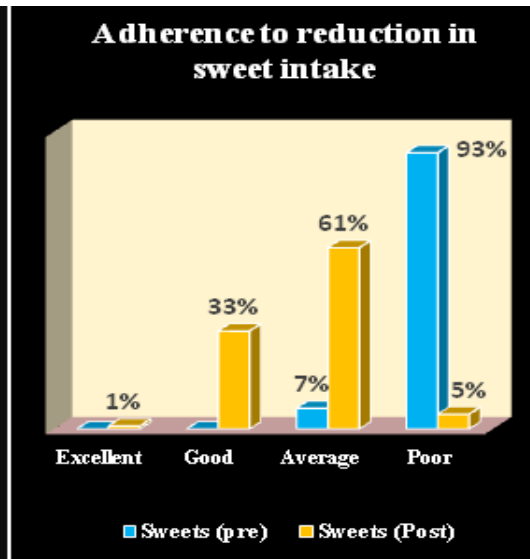
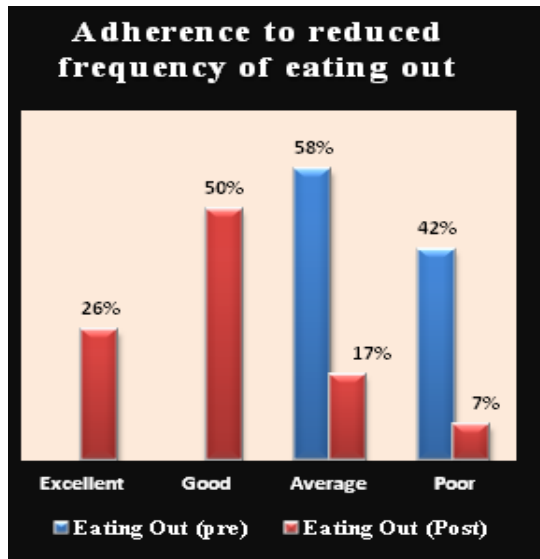


Figure 3. Avoidance of eating out

Figure 4. Avoidance to sweet intake

Fried foods contain high energy, high fat and often salt, leading to obesity. A study reveals fried food is associated positively with general and central obesity. Consumption of fried foods more frequently (i.e. ≥ 4 times/week) is linked with a greater risk of developing type 2 diabetes, obesity and hypertension (Gadiraju et al., 2015). The food intake of Indians, are unhealthy as near about 19% having unhealthy dietary behavior (Faizi et al., 2018). Nineteen per cent participants

used to eat fried foods daily, which reduced to 3 per cent after intervention. Adherence to avoidance of fried food consumption was found good among participants. Fast food consumption is linked with a higher body mass index, less fruitful weight-loss maintenance and weight gain. All the study participants were eating junk food once in a week before intervention. After intervention participants eating junk food weekly reduced to 28 per cent.

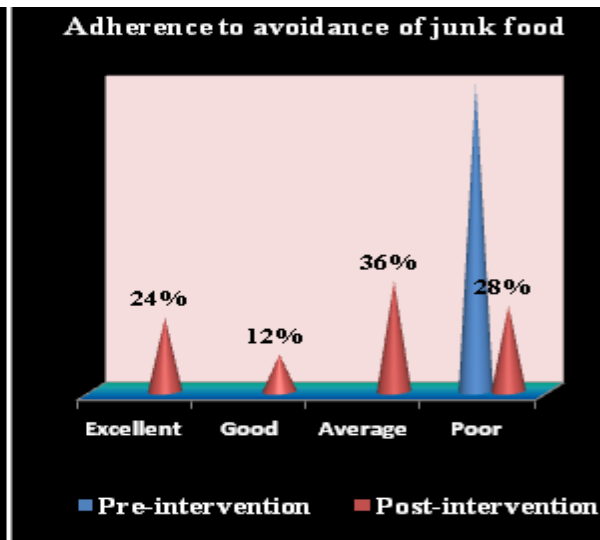
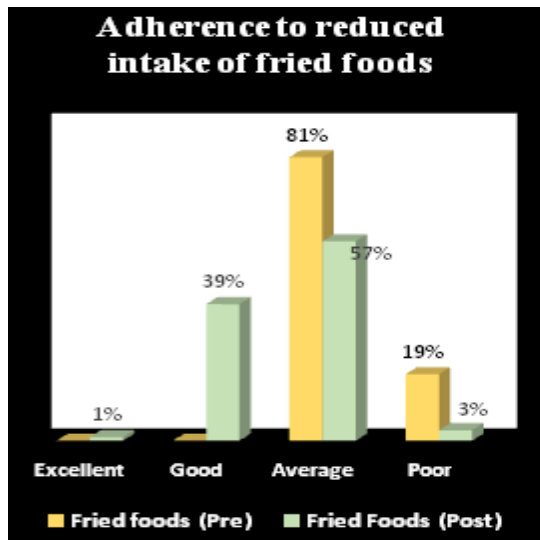


Figure 5. Avoidance to fried foods intake

Figure 6. Avoidance to junk foods intake

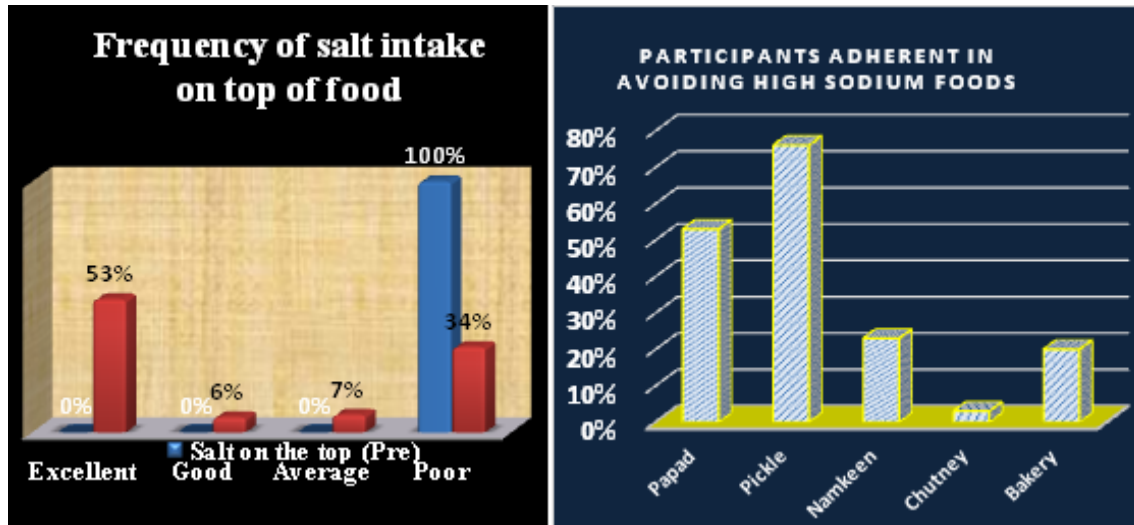


Figure 7. Avoidance to salt on top of food Figure 8. Participants adherent in avoiding high sodium foods

Excess sodium intake leads to hypertension because it retains extra fluid in the body, which builds an extra load on the heart. Excessive sodium will increase the risk of stroke, heart failure, kidney disease and stomach cancer. Papad, pickle, namkeen (savory product), chutneys and bakery products are high in sodium. The highest adherence to avoidance was found for pickle, whereas the lowest was found for chutney.

Adherence to healthy dietary practices

Fruits and vegetables are rich in fibre, antioxidants, vitamins, minerals and

phytochemicals. Low fruit and vegetable consumption is linked to high prevalence of cardiovascular disease and cancer. Studies show that increased consumption of fruit and vegetable was linked with a reduced risk of obesity. The majority of the participants were consuming less than three servings of fruits and vegetables per day before intervention whereas majority of the participants consumed 3-5 servings of fruits and vegetables per day after intervention (Figure 9). Participants consuming less than three servings daily were 82 per cent before intervention that reduced to 34 per cent after intervention.

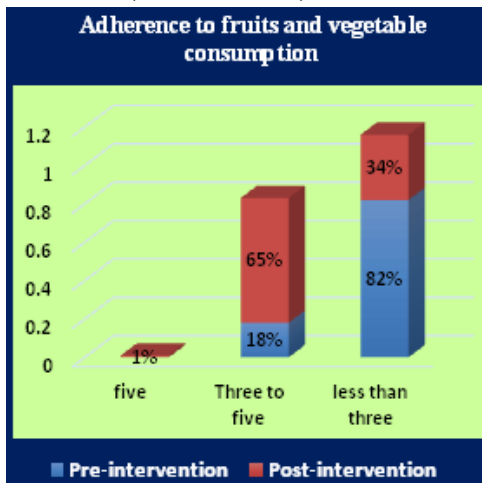


Figure 9. Fruits and vegetables consumption

Adherence to consumption of healthy nuts

Flax seeds improve cholesterol by lowering total cholesterol and low-density lipoprotein. Consumption of flax seeds by study participants was poor before intervention, as 90 per cent participants never had flax seeds before intervention. Participants eating flax seeds daily were 57 per cent after intervention. It can be said that very good adherence was found in terms of consumption of flax seeds. About 44 per cent participants were eating soaked almonds daily before intervention, which increased to 83 per

cent after intervention. The frequency of consumption of flax seeds and soaked almonds increased after the intervention (Figure 11 and 12). More than half of the participants never consumed walnut before and after intervention. Most of the participants never consumed figs before and after intervention. The majority of the participants were non-adherent to walnut and figs consumption. The reason may be the non-availability of walnuts and figs at home.

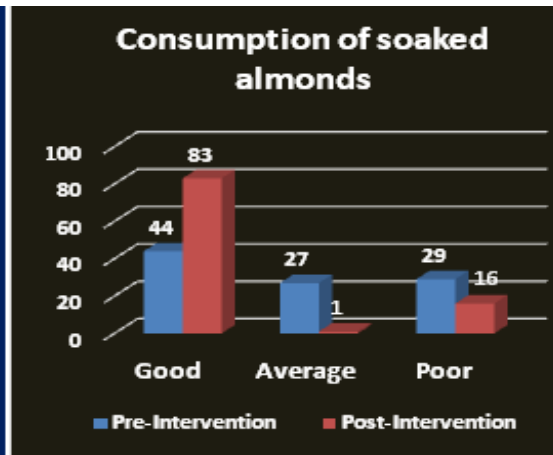
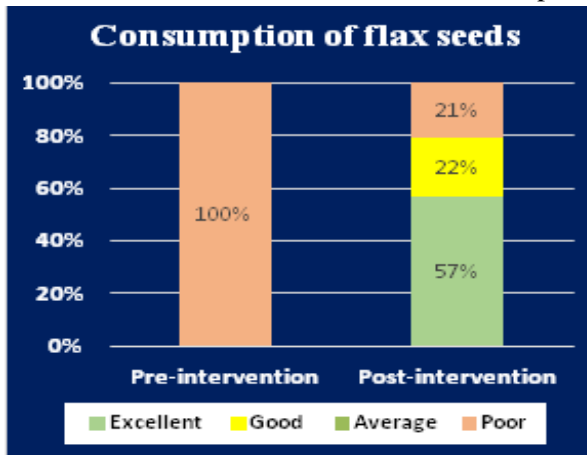


Figure 11. Consumption of flax seeds

Figure 12. Consumption of soaked almonds

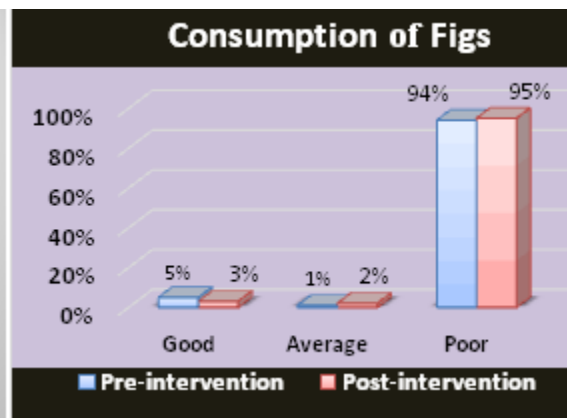
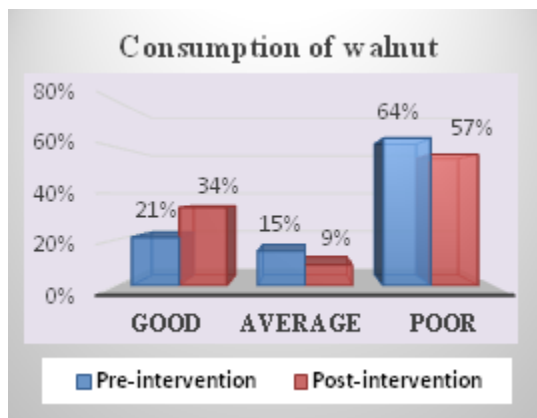


Figure 13. Consumption of walnut

Figure 14. Consumption of Figs

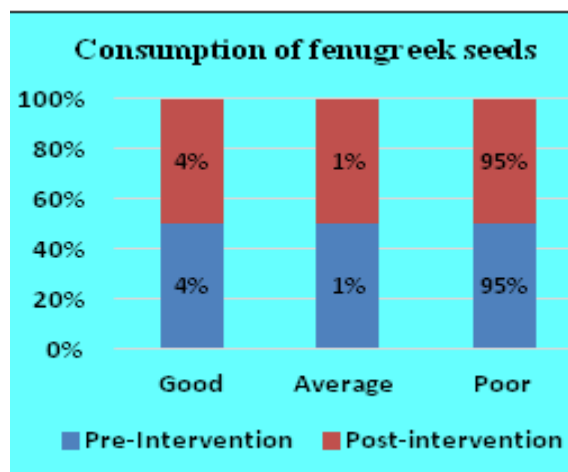


Figure 15. Consumption of fenugreek seeds

The majority of the participants had poor adherence for consumption of fenugreek seeds, whereas the increase in consumption of defatted soya nuggets was found statistically significant. All the participants were consuming soya nuggets either daily or weekly. Majority of the participants were eating soya nuggets weekly. Participants consuming soya nuggets weekly was reduced and daily consumption increased by each months of intervention.

Reasons for non-adherence to a healthy lifestyle

Majority of the participants (89%) reported a busy schedule as a reason for non-adherence to exercise. Other reasons reported for non-adherence to exercise were unfavorable weather, laziness, lack of accompanying person, and criticism. Ninety-five per cent of participants reported forced eating out as a reason for non-adherence to the dietary regimen. Non-availability of healthy foods at home is the second primary reason reported by nearly 91 per cent of study participants. Granting self-permission is the third primary reason reported by nearly 80 per cent of participants for dietary non-adherence. Poor self-control was the fourth primary reason reported by 24 per cent of participants. Twenty-three per cent of participants did not receive support from family members, whereas 91 per

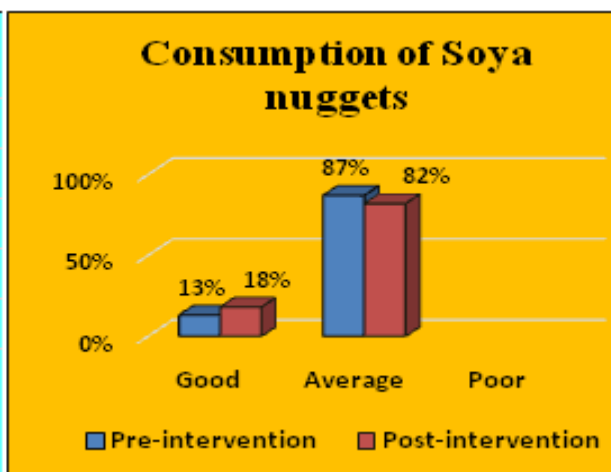


Figure 16. Consumption of soya nuggets

cent of participants received support from their friends for adhering to healthy lifestyle changes.

Conclusion

Adherence to exercise regimen was improved after 3 months short term lifestyle intervention could improve the physical activity among participant as they started doing exercise and walking. A busy schedule was the key reason for non-adherence to the exercise regimen in few participants. Adherence to diet was better than exercise. Faulty dietary habits were reduced significantly after three months of intervention. Participants were non-adherent to the consumption of figs, walnut and fenugreek seeds. Forced eating out, unavailability of healthy food and granting self-permission were the primary reasons for dietary non-adherence. Friend's support was the primary reason for adherence. Adherence to correct dietary practices and regular physical activity leads to reduction in BMI from 30.2 to 28.8 due to intervention. It can be concluded that short term lifestyle intervention could change the eating behavior and exercise regime of study participants and the behavior change was visible in reduction in body mass index.

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