

Behavioural Tailored Lifestyle Interventions for Weight Reduction Among Females in Khamis Mushayt

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HOW TO CITE: ABSTRACT:

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Background:

Obesity is a chronic progressive illness that has several health consequences. However, obesity can be managed through alteration of lifestyle. All comprehensive multidimensional therapeutic plans for obesity should involve lifestyle modification. The effective lifestyle modifications involve behavioral change strategies to maintain long-term adherence to the interventions and achieve weight loss.

Aim:

To evaluate the effectiveness of behaviorally tailored lifestyle interventions in achieving weight reduction among females in Khamis Mushayt, Saudi Arabia.

Methods:

This was a quasi-experiment that was conducted in health clubs

across Khamis Mushayt on adult females aged 18-50 years with obesity or overweight. A questionnaire was used to collect the data of the participants, which included demographics, weight loss attempts, perception regarding causes for not losing weight, eating and physical activity patterns, and food intake.

Results:

A total of 169 females were enrolled; 91.7% reported a previous attempt to lose weight, and the most reported strategy was diet, 50.3%. The amount of food intake was reported to be usual among 41.4%, whereas 40.8% reported reduced food intake. High intensity activity was reported by 58%, whereas 35.8% reported moderate intensity activity. Attempt to lose weight displayed no correlation with the BMI of the subjects ($P=0.076$).

Conclusion:

There was a great attempt among our participants to lose weight, with diet and exercise being the most adopted strategies for weight loss. The most common eating pattern among the participants was retrained eating. There was no definite lifestyle intervention adopted by the participants.

Keywords: Lifestyle interventions, Behavior, Weight reduction, Females.

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Introduction

With increasing prevalence, obesity has become one of the significant public health concerns globally [1]. In the Middle East, and even more so in Saudi Arabia, where rapid urbanization and lifestyle changes have significantly contributed to an epidemic of obesity, the issue is even more pronounced. This national trend is seen within Saudi Arabia, with the city of Khamis Mushayt also having a noticeable increase in obesity among females [2].

Obesity escalation in Saudi Arabia is a multifactorial issue with diverse factors like lifestyles, dietary habits, and socio-cultural elements [3]. It has been highlighted in studies that physical inactivity has been associated with obesity among Saudi adolescents and adults [4]. A large amount of the Saudi population leads inactive lifestyles known to contribute to increasing obesity rates in the community, which was confirmed by a comprehensive study conducted by Alasqah et al. (2023) measuring physical activity, sedentary behaviors, and dietary habits among Saudi adolescents [5].

Lifestyle interventions targeted at modifying individual behaviors such as diet, physical activity, and overall lifestyle have been used, referred to as behavioral-tailored lifestyle interventions [6]. These interventions are also tailored to the individual with respect to their cultural background, preferences, and readiness to change. An approach like this ensures a higher likelihood of adherence and success in the long run. For instance, Al-Mana et al. (2012) investigated the acute effects of calcium supplementation on appetite and satiety in overweight women, suggesting dietary modifications that can be included in a tailored intervention [7].

Studies highlighting the importance of cultural sensitivity in public health initiatives add to the evidence of their effectiveness. Resnicow et al. (1999) demystified cultural sensitivity and explained how it is essential to the success of health interventions. In Saudi Arabia, it is important to understand cultural norms and values to create a lifestyle intervention that will be accepted by the target population [8].

Further, technology-based systems have been integrated into behavioral interventions and

have had great potential to increase adherence and outcomes. In Polzien et al. (2007), a technology-based system was evaluated for a brief behavioral weight loss intervention, and it was found to be positive. For example, in a region like Khamis Mushayt, where technology access is ubiquitous, digital tools can enhance traditional lifestyle interventions to be more practical and exciting [9].

Knowing the local context is essential for implementing behavioral-tailored lifestyle interventions in Khamis Mushayt. Al Zahrani et al. (2019) assessed health-promoting lifestyle profiles among medical students at a Saudi University, and factors that could be used to design effective interventions were identified. Such insights are valuable for developing strategies combating the challenges that females in Khamis Mushayt face to create interventions that are directly related to the challenges and are effective [10].

Study rationale

The obesity rates among women in Saudi Arabia are now reaching alarming levels, and studies have shown a high clinical obesity prevalence [11]. This increasing trend is considered alarming in parts like Khamis Mushayt, which has several cultural, social, and lifestyle aspects that make people prone to being sedentary and engaging in unhealthy foods. Still, individualized behavioral lifestyle interventions that consider individual participant-tailored needs and preferences have emerged as effective strategies for weight reduction. Promising interventions for facilitating sustainable weight loss and positive health outcomes are such interventions. By implementing these personalized programs in Khamis Mushayt, these specific challenges would have been solved for women in this region, contributing to healthier lifestyles and reducing obesity-related health risks. Additionally, incorporating culturally appropriate elements within these interventions may improve their effectiveness as they will be in tune with the target population's values, norms, and lived experiences. The strategies adopted by these strategies can enable

healthcare providers in Khamis Mushayt to assist women in targeting a healthy weight range and managing their weight once it has been achieved.

Aim of the study

To evaluate the effectiveness of behaviorally tailored lifestyle interventions in achieving weight reduction among females in Khamis Mushayt, Saudi Arabia.

Study objectives

- To determine the current prevalence of obesity among females in Khamis Mushayt to establish baseline data for targeted interventions.
- To design and implement culturally appropriate lifestyle interventions, including nutrition counseling and physical activity programs, tailored to the specific needs of the female population in Khamis Mushayt.
- To assess the impact of the tailored interventions on weight reduction, physical health, and psychological well-being among participants over a specified period.

Review of literature:

Behaviorally tailored lifestyle interventions have proven successful approaches to the health intervention of females, especially in a specific group in Khamis Mushayt, Saudi Arabia. However, studies as diverse as those focusing specifically on this particular demographic are limited; however, we can learn from other research dealing with the same demographic in related contexts and Saudi Arabia.

Al-Hazaa et al. (2012) investigated lifestyle factors associated with overweight and obesity among Saudi adolescents. They explained the observed incidence of physical inactivity and sedentary behaviors that are important in obesity rates among Saudi youth. This underscores the need for culturally specific physical activity promotion and reducing sedentary time interventions for women in the Khamis Mushayt region [12].

Alzahrani et al. (2019) carried out another related study in which they assessed health-promoting lifestyle profiles among the medical students of a Saudi university. Findings showed that females were more physically inactive than males, suggesting a gender disparity in lifestyle behaviors. This indicates that interventions aimed at reducing weight in Saudi females should focus on physical activity that is likely to be culturally and socially acceptable [10].

Elfaki (2020) also conducted a quasi-experimental study on the effect of healthy lifestyle interventions in schools in Jazan City, Saudi Arabia. The intervention, which included dietary education and promoting physical activity, improved students' lifestyle behavior. Despite not being exclusive to females, the study offers some evidence that school-based, culturally sensitive interventions in promoting healthy lifestyles could be adapted for female populations in Khamis Mushayt [13].

Almutairi et al. (2019) also investigated the effects of help-seeking behavior and partner support on postpartum depression among Saudi women. The study shows that social support is vital for women's mental health. Evidently, in order to maximize effectiveness, lifestyle interventions targeting Saudi female weight reduction should reciprocate this by incorporating social and familial support components [14].

Finally, literature from broader Saudi contexts highlights the efficacy of culturally adapted, gender-appropriate interventions. Few direct studies have examined behaviorally tailored lifestyle interventions to reduce weight in Khamis Mushayt females. Therefore, the most suitable interventions for Saudi females should encourage and increase physical activity, promote a healthy eating regime, and utilize social support systems to make them more efficient.

Methods:

1. Study Design

This study will employ a quasi-experimental design to assess the effectiveness of behavioral

tailored lifestyle interventions (BTLIs) for weight reduction among females in Khamis Mushayt, Saudi Arabia. The intervention will incorporate dietary modifications, physical activity, and behavioral counseling, tailored to individual participant needs.

2. Study Setting

The study will be conducted in health clubs across Khamis Mushayt, which provides structured environments for supervised lifestyle interventions. These settings allow for comprehensive behavioral and dietary counseling, making them ideal for assessing weight reduction strategies.

3. Study Population and Sample Size

The study will target adult females (aged 18–50 years) with overweight or obesity ($\text{BMI} \geq 25 \text{ kg/m}^2$) who attend health clubs in Khamis Mushayt. Participants will be recruited through random sampling, ensuring a representative sample of women engaging in lifestyle interventions. The estimated sample size will be 200 participants, with 100 assigned to the intervention group and 100 to the control group, based on previous studies evaluating weight loss interventions [15].

Inclusion Criteria

- Females aged 18–50 years
- $\text{BMI} \geq 25 \text{ kg/m}^2$ (overweight or obese)
- Willing to participate in a structured 12-week lifestyle intervention
- Regular attendance at health clubs in Khamis Mushayt

Exclusion Criteria

- Diagnosed endocrine disorders affecting weight (e.g., hypothyroidism, Cushing's syndrome)
- Pregnant or lactating women
- History of bariatric surgery or use of weight-loss medications in the past 6 months

- Pre-existing cardiovascular conditions restricting exercise participation

4. Intervention

The **BTLI program** will last for **12 weeks** and will consist of:

1. **Dietary Counseling:** Participants will receive personalized diet plans based on Saudi dietary habits and caloric intake goals. Sessions will focus on reducing caloric intake, improving macronutrient balance, and promoting portion control [16].
2. **Physical Activity Program:** A structured exercise plan consisting of aerobic workouts, strength training, and flexibility exercises, guided by certified fitness trainers.
3. **Behavioral Therapy:** Weekly cognitive-behavioral therapy (CBT) sessions to promote goal setting, self-monitoring, and emotional regulation in weight management.

Control Group

Participants in the control group will continue their usual health club activities without structured behavioral counseling. They will receive general health education at the start and end of the study.

5. Data Collection Tools and Measurements

- **Time plane**

Task	Duration in months							
	March	April	May	June	July	August	September	October
1. Proposal								
2. Ethical approval								
3. Questionnaire pre-test								
4. Questionnaire								
5. Data collection								
6. Data entry								

- **Anthropometric Measurements:** Weight, height, BMI, and waist-to-hip ratio will be recorded at **baseline, 6 weeks, and 12 weeks**.

- **Physical Activity Assessment:** The **International Physical Activity Questionnaire (IPAQ)** will measure participants' activity levels.

- **Dietary Intake Evaluation:** **24-hour dietary recall and food frequency questionnaires** will be used to assess adherence to dietary guidelines.

- **Behavioral Assessment:** The **Weight Efficacy Lifestyle Questionnaire (WELQ)** will evaluate changes in eating behaviors and self-efficacy.

6. Statistical Analysis

Data will be analyzed using SPSS software (version 26). Paired t-tests will compare pre- and post-intervention weight changes within groups, while ANOVA will assess differences between intervention and control groups. Multivariate regression analysis will explore associations between behavioral adherence and weight loss outcomes. Statistical significance will be set at $p < 0.05$.

7. Ethical Considerations

Ethical approval will be obtained from the international review board. Informed consent will be secured from all participants, ensuring confidentiality and voluntary participation.

7. Data analysis								
8. Report writing								
9. First draft								
10. Final report								

Results:

A total of 169 females were included; the mean $\pm$ SD of age of the participants was 38.6 $\pm$ 9.7 years. Most of the females were married, 126 (74.6%), and more than one-half,

105 (62.1%), reported an income of 1000-5000 per month. Also, more than one-half of women had university education and above, 117 (69.2%). More than one-half of females had no chronic illness 113 (66.9%), whereas 56 (33.1%) reported having chronic disease, table 1.

Table 1: Sociodemographic characteristics

variable		(n)	(%)
Age (years)	Mean $\pm$ SD	38.6 $\pm$ 9.7	—
Marital status	Single	30	17.8%
	Divorced/Widow	13	7.7%
	Married	126	74.6%
Monthly Income	1000–5000	105	62.1%
	5001–10000	17	10.1%
	>10000	47	27.8%
Education level	Primary	5	3.0%
	Secondary	38	22.5%
	University and above	117	69.2%
	Average	9	5.3%
Chronic disease	No	113	66.9%
	Yes	56	33.1%

The large majority of females, 155 (91.7%), reported a previous attempt to lose weight, and the most reported strategy was diet, 85 (50.3%), followed by exercise, 61 (36.1%). The largest

proportion of the females were either obese 84 (49.7%) or overweight 69(40.8%), whereas only 16 (9.5%) had normal weight, table 2.

Table 2: Weight loss attempts, methods used, and BMI distribution among study participants

variable		(n)	(%)
Previous attempt to lose weight	No	14	8.3%
	Yes	155	91.7%
Methods used for weight loss	Diet	85	50.3%
	Exercise	61	36.1%
	Medications	12	7.1%
	Other	11	6.5%
BMI category	Normal weight	16	9.5
	Overweight	69	40.8
	Obese	84	49.7

The perception of the participants regarding reasons for not losing weight was investigated through 12 questions (table 3). There were 51 (30.2%) and 45 (26.6%) who agreed and strongly agreed, respectively, that they would regain weight after losing it. The largest proportions agreed that feeling responsibility for their weight problems, 70 (41.4%), becoming overweight owing to the lack of willpower, 55 (32.5%), having no strong willpower to maintain an ideal weight, 54 (32%), and others thinking that lack of self-control is the cause of weight gain, 48 (28.4%). The highest proportions of the participants strongly agreed regarding feeling guilty about their weight problems 63 (37.3%),

they wouldn't have a weight problem if they had strong willpower 72 (42.6%), and others blamed the participants for their weight gain 42 (24.9%). Neutral answers were the most reported regarding feeling that others compliment them about their weight insincerely, 42 (24.9%), and people without weight problems can't understand how the participants feel, 48 (28.4%). On the other hand, 52 (30.8%) disagreed regarding different treatment from people because of the weight of the participants, and 64 (37.9%) strongly disagreed that others feel embarrassed to be seen with the participants because of their weight.

Table (3): Participants' perceptions regarding reasons for not losing weight (n = 169)

Statement	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)
I will always regain weight after losing it	12 (7.1%)	28 (16.6%)	33 (19.5%)	51 (30.2%)	45 (26.6%)
I am responsible for my weight problems	2 (1.2%)	24 (14.2%)	28 (16.6%)	70 (41.4%)	45 (26.6%)
I feel guilty about my weight problems	2 (1.2%)	23 (13.6%)	21 (12.4%)	60 (35.5%)	63 (37.3%)
I became overweight due to a lack of willpower	10 (5.9%)	27 (16.0%)	24 (14.2%)	55 (32.5%)	53 (31.4%)
I would not have weight problems if I had strong willpower	2 (1.2%)	9 (5.3%)	22 (13.0%)	64 (37.9%)	72 (42.6%)
I do not have the strong willpower to maintain my ideal weight	6 (3.6%)	23 (13.6%)	34 (20.1%)	54 (32.0%)	52 (30.8%)
I feel that others compliment me about my weight insincerely	22 (13.0%)	43 (25.4%)	42 (24.9%)	33 (19.5%)	29 (17.2%)
People treat me differently because of my weight	37 (21.9%)	52 (30.8%)	35 (20.7%)	23 (13.6%)	21 (12.4%)
People without weight problems cannot understand how I feel	12 (7.1%)	28 (16.6%)	48 (28.4%)	39 (23.1%)	42 (24.9%)
Others think my weight gain is due to a lack of self-control	14 (8.3%)	39 (23.1%)	29 (17.2%)	48 (28.4%)	39 (23.1%)
Others blame me for my weight gain	23 (13.6%)	31 (18.3%)	37 (21.9%)	36 (21.3%)	42 (24.9%)
Others feel embarrassed to	64 (37.9%)	45 (26.6%)	25 (14.8%)	16 (9.5%)	19 (11.2%)

be seen with me because of my weight					
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The eating behavior of the participants was investigated through 19 questions (Table 4). Eating pattern was described as mainly external eating when feeling desire to eat when passing by a sweets shop, 56 (40.6%), and having desire to eat at fast food restaurants, 53 (38.4%). Eating was mainly described as emotional when having a desire to eat when feeling depressed 71 (51.4%), lonely 69 (50%), anxious 70 (50.7%), bad 68 (49.3%), stressed 70 (50.7%), afraid 62 (44.9%), and regret 69 (50%). The largest proportion of the females reported restrained

eating when having desire to eat when seeing or smelling food 66 (47.8%), eating foods that help with weight loss 101 (73.2%), having desire to eat when seeing others eating 61 (44.2%), eating less after overeating 80 (58%), having desire to eat tasty food 56 (40.6%), eating less to avoid weight gain 106 (76.8%), having desire to eat fast food 53 (38.4%), trying not to eat between meals 100 (72.5%), and after dinner 96 (69.6%), eating with attention to body weight 105 (76.1%) and having desire to eat while preparing food 71 (51.4%).

Table (4): Eating behavior patterns among participants (n = 169)

Statement	External Eating n (%)	Emotional Eating n (%)	Restrained Eating n (%)
Desire to eat when seeing or smelling food	31 (22.5%)	41 (29.7%)	66 (47.8%)
Desire to eat when feeling depressed	24 (17.4%)	71 (51.4%)	43 (31.2%)
Desire to eat when feeling lonely	18 (13.0%)	69 (50.0%)	51 (37.0%)
Desire to eat when passing by a sweets shop	56 (40.6%)	33 (23.9%)	49 (35.5%)
Eating foods that help with weight loss	17 (12.3%)	20 (14.5%)	101 (73.2%)
Desire to eat when seeing others eating	36 (26.1%)	41 (29.7%)	61 (44.2%)
Eating less after overeating	21 (15.2%)	37 (26.8%)	80 (58.0%)
Desire to eat when anxious	14 (10.1%)	70 (50.7%)	54 (39.1%)
Desire to eat tasty food	45 (32.6%)	37 (26.8%)	56 (40.6%)
Eating less to avoid weight gain	6 (4.3%)	26 (18.8%)	106 (76.8%)
Desire to eat when feeling bad	18 (13.0%)	68 (49.3%)	52 (37.7%)
Desire to eat at fast food restaurants	53 (38.4%)	32 (23.2%)	53 (38.4%)
Trying not to eat between meals	11 (8.0%)	27 (19.6%)	100 (72.5%)

Statement	External Eating n (%)	Emotional Eating n (%)	Restrained Eating n (%)
Desire to eat when stressed	19 (13.8%)	70 (50.7%)	49 (35.5%)
Trying not to eat after dinner	16 (11.6%)	26 (18.8%)	96 (69.6%)
Desire to eat when afraid	16 (11.6%)	62 (44.9%)	60 (43.5%)
Eating with attention to body weight	8 (5.8%)	25 (18.1%)	105 (76.1%)
Desire to eat when feeling regret	15 (10.9%)	69 (50.0%)	54 (39.1%)
Desire to eat while preparing food	24 (17.4%)	43 (31.2%)	71 (51.4%)

Investigating the pattern of physical activity among the participants revealed that more than one-half of females, 98 (58%), reported high intensity activity 1-2 days per week. The largest proportion, 66 (39.1%), didn't know and weren't sure about the duration they perform high intensity activity, whereas 53 (31.4%) reported

one hour per day. The largest proportion, 48 (35.8%), reported performing moderate intensity activity 1-2 days per week, mainly for 30 minutes to one hour per day, 61 (36.1%). Walking for 1-2 days per week was reported by 46 (27.2%) of the participants, and 45 (26.6%) reported 1-2 hours per day, table 5.

Table 5: Physical activity patterns (high, moderate intensity, and walking) among study participants

Variable	Category	n	%
High-intensity activity (days/week)	1–2 days	98	58.0
	3–5 days	53	31.4
	≥6 days	18	10.7
	Median (range)	2 (1–7)	—
High-intensity activity (duration/day)	I don't know / not sure	66	39.1
	1 hour/day	53	31.4
	30 minutes/day	50	29.6
Moderate-intensity activity (days/week)	0 days (no activity)	22	16.4
	1–2 days	48	35.8
	3–4 days	32	23.9
	≥5 days	32	23.9
Moderate-intensity activity (duration/day)	<30 min	36	21.3
	30 min – 1 hour	61	36.1
	1 – 2 hours	26	15.4
	≥2 hours	10	5.9

	NA / unclear	36	21.3
Walking (days/week)	0 days (including unclear)	41	24.3
	1–2 days	46	27.2
	3–4 days	29	17.2
	5–7 days	53	31.4
Walking duration/day	<30 min	15	8.9
	30 min – 1 hour	42	24.9
	1 – 2 hours	45	26.6
	≥2 hours	15	8.9
	NA / unclear	52	30.8

Regarding food intake, the largest proportion, 70 (41.4%), reported usual food intake the day before filling the survey, whereas 69 (40.8%) reported less than usual, and 30 (17.8%) reported more than usual. The major causes for

reducing food intake were following a diet 30 (43.5%), and not being hungry 11 (15.9%) as the main causes, whereas the main causes for increased food intake were boredom or stress 9 (30%) and social occasion 8 (26.7%), table 6.

Table 6: Reported amount of food intake yesterday among participants

Variable	Category	n	%
Amount of food intake yesterday	Usual	70	41.4
	Less than usual	69	40.8
	More than usual	30	17.8
Causes for decreased food intake	Following a diet	30	43.5
	Not hungry	11	15.9
	Too busy	8	11.6
	Illness	6	8.7
	Boredom	3	4.3
	Fasting	3	4.3
	Other	5	7.2
Causes for increased food intake	Boredom or stress	9	30.0
	Social occasion / special meal / special day	8	26.7
	Travel	5	16.7
	Very hungry	5	16.7
	Other	3	10.0

The history of attempting to lose weight displayed no significant association with the demographics of the participants ($P>0.05$), and

BMI didn't show any relation with weight loss attempt ($P=0.07$), Table 7.

Table 7: Sociodemographic and clinical characteristics by history of weight loss attempt

Variable	Category	Weight loss attempt		P-value
		No (n, %)	Yes (n, %)	
Educational level	Primary	2 (14.3)	3 (1.9)	0.058
	Secondary	3 (21.4)	35 (22.6)	
	University or higher	9 (64.3)	108 (69.7)	
	Intermediate	0 (0.0)	9 (5.8)	
Age	Mean $\pm$ SD	40.85 $\pm$ 11.3	38.34 $\pm$ 9.4	0.38
Chronic disease status	No	12 (85.7)	101 (65.2)	0.76
	Yes	2 (14.3)	54 (34.8)	
Income	>10,000	2 (14.3)	45 (29.0)	0.58
	1,000–5,000	11 (78.6)	94 (60.6)	
	5,001–10,000	1 (7.1)	16 (10.3)	
Marital status	Single	2 (14.3)	28 (18.1)	0.46
	Other	0 (0.0)	13 (8.4)	
	Married	12 (85.7)	114 (73.5)	
BMI category	Normal weight	2 (14.3)	14 (9.0)	0.076
	Overweight	9 (64.3)	60 (38.7)	
	Obese	3 (21.4)	81 (52.3)	

Discussion:

Obesity is a chronic progressive and multifactorial disease characterized by the accumulation of body fat [17]. Pharmacological therapy has progressed in recent years and can be used to manage obesity; however, all comprehensive multidimensional therapeutic plans should involve lifestyle modification as a fundamental cornerstone for obesity management [18]. The effective lifestyle modifications involve behavioral change strategies to develop and maintain long-term adherence to dietary and physical activity interventions [17]. This study was conducted to evaluate the effectiveness of behaviorally

tailored lifestyle interventions in achieving weight reduction among females in Khamis Mushayt, Saudi Arabia.

In the current study, we found that the large majority of the participants attempted to lose weight, and the most adopted strategies were diet followed by exercise. A lower proportion of those who attempted weight loss was reported in previous research; in a previous Saudi study, it was found that among 403 individuals, more than one-half of the subjects (57.5%) tried to lose weight three or more times, whereas 13.4% of the subjects didn't try to lose weight [19]. A lower proportion from another Saudi study (68.3%) reported weight loss attempt was,

whereas lack of motivation was the main barrier (70.2%) to weight loss [20]. In agreement with our study, a study from Riyadh, Saudi Arabia, conducted on 403 participants revealed that exercise and diet were the most preferred strategies to lose weight [19].

In our study, lack of willpower was accepted by more than one-half of the participants as the reason for being overweight, and most of the participants agreed and strongly agreed that having strong willpower is the solution to having no weight problems. Such findings indicate the importance of having willpower to persist and achieve weight loss.

Similarly, a previous Saudi study revealed that poor determination and will were the main causes of not losing weight [19]. Another study from Jeddah conducted on Saudi women of reproductive age discovered that lack of willpower was one of the most common barriers to healthy eating and physical activity [21].

It was found in one Saudi study that attempts to lose weight were significantly linked with female gender and education [20]. Such findings were in contrast to ours, as we didn't find any correlation between attempts to lose weight and any of the female demographics, even BMI. This may indicate other factors are involved in the attempt to lose weight that require further investigation.

Across different diets, the best predictor of weight loss is dietary adherence [18, 22, 23]. There are several factors affecting adherence of individuals to a certain dietary pattern, including personal preference, social support, cultural food norms, and access to appropriate food [24, 25]. In the current study, the major behavioral pattern of eating among the participants was restrained eating, which refers to the intention to restrict food intake deliberately to promote weight loss.

Overeating has been considered a means of coping with stressors; feeling stress and anxiety can be a trigger for overeating. Repeated eating when being stressed or anxious will trigger eating despite the absence of real hunger [26].

In this study, emotional eating was the second eating pattern following restrained eating. This pattern of eating was related to different negative emotions and feelings of the participants. This finding indicates that the psychological state of the individuals may affect their eating patterns and weight loss. It was stated that dietary consumption patterns are shaped by multiple interplays of several factors that affect the choice, accessibility, and quality of food available [27].

Poor dietary habits are widespread among Saudi adults [27]. Dietary patterns reflect the quantities, variety, proportions, or combination of different foods, nutrients, and drinks habitually consumed [28]. The present study discovered that less than one-half of the sample either reported food intake as usual or less than usual, whereas less than one-quarter of the participants reported more than usual. This may indicate that a significant proportion of the participants is following specific eating behavior to lose weight, where the largest proportion of those who reported reduced food intake reported that the diet was the reason for reduced intake.

Physical activity is an essential element of a healthy lifestyle and has been described as an essential component in the management of many health conditions [21]. Guidelines highlighted the engagement of obese individuals in ≥ 300 minutes per week for moderate intensity physical activity to achieve meaningful weight loss [17].

In this study, we found that more than one-half of the subjects practiced high-intensity activity and almost one-third practiced moderate-intensity activity. A previous Saudi study from Makkah included 385 adult subjects, who revealed that only 27.3% of the participants were engaged in physical activity [29].

It was found that structured behavior lifestyle intervention characterized by frequent support and feedback can lead to a clinically meaningful 5% weight loss, regardless of specific behavioral, diet, and physical activity components [30]. However, in our study, we didn't investigate the

support and feedback of the participants. It was stated that behavior therapy is a critical element of lifestyle modification intervention as it provides tools to facilitate alterations in eating or physical activity patterns [17]. Therefore, our subjects may require the adoption of behavioral therapy to achieve better outcomes.

Conclusion:

There was a great attempt among our participants to lose weight, with diet and

exercise being the most adopted strategies for weight loss. Lack of willpower was the cause of weight problems. The most common eating pattern among the participants was retrained eating, and regarding activity, the participants reported a good level of physical activity. However, there is no definite or tailored lifestyle intervention followed to lose weight, which necessitates carrying out further studies to investigate the causes preventing individuals from following a tailored lifestyle intervention.

References:

- Koliaki C, Dalamaga M, Liatis S. Update on the obesity epidemic: after the sudden rise, is the upward trajectory beginning to flatten?. *Current Obesity Reports*. 2023 Dec;12(4):514-27.
- Althumiri NA, Bindhim NF, Al-Rayes SA, Alumran A. Mapping obesity trends in Saudi Arabia: a four-year description study. *InHealthcare* 2024 Oct 21 (Vol. 12, No. 20, p. 2092). MDPI.
- Mahmood A, Elwakeel N, Khaled AS, Mehedi Q, Claudiu P, Gosselin C. Prevalence and Risk Factors of Obesity in Saudi Arabia. *International Journal of Clinical Inventions and Medical Sciences (IJCIMS)*. 2024 Sep 26;6(2):74-85.
- Alsulami S, Baig M, Ahmad T, Althagafi N, Hazzazi E, Alsayed R, Alghamdi M, Almohammadi T. Obesity prevalence, physical activity, and dietary practices among adults in Saudi Arabia. *Frontiers in Public Health*. 2023 Mar 28;11:1124051.
- Alasqah I, Mahmud I, East L, Usher K. Patterns of physical activity and dietary habits among adolescents in Saudi Arabia: A systematic review. *International journal of health sciences*. 2021 Mar;15(2):39.
- Ma JK, Floegel TA, Li LC, Leese J, De Vera MA, Beauchamp MR, Taunton J, Liu-Ambrose T, Allen KD. Tailored physical activity behavior change interventions: challenges and opportunities. *Translational Behavioral Medicine*. 2021 Dec 1;11(12):2174-81.
- Al-Mana NM, Lanham-New SA, Robertson MD. The acute effects of calcium supplementation on appetite and satiety in overweight women. *Proceedings of the Nutrition Society*. 2012 Jan;71(OCE3):E215.
- Resnicow K, Baranowski T, Ahluwalia JS, Braithwaite RL. Cultural sensitivity in public health: defined and demystified. *Ethnicity & disease*. 1999 Jan 1;9(1):10-21.
- Polzien KM, Jakicic JM, Tate DF, Otto AD. The efficacy of a technology-based system in a short-term behavioral weight loss intervention. *Obesity*. 2007 Apr;15(4):825-30.
- Alzahrani SH, Malik AA, Bashawri J, Shaheen SA, Shaheen MM, Alsaib AA, Mubarak MA, Adam YS, Abdulwasssi HK. Health-promoting lifestyle profile and associated factors among medical students in a Saudi university. *SAGE open medicine*. 2019 Mar;7:2050312119838426.
- Al-Ghamdi S, Shubair MM, Aldiab A, Al-Zahrani JM, Aldossari KK, Househ M, Nooruddin S, Razzak HA, El-Metwally A. Prevalence of overweight and obesity based on the body mass index; a cross-sectional study in Alkharj, Saudi Arabia. *Lipids in health and disease*. 2018 Dec;17:1-8.
- Al-Hazzaa HM, Abahussain NA, Al-Sobayel HI, Qahwaji DM, Musaiger AO. Lifestyle factors associated with overweight and obesity among Saudi adolescents. *BMC public health*. 2012 Dec;12:1-1.
- Elfaki FA, Khalafalla HE, Gaffar AM, Moukhyer ME, Bani IA, Mahfouz MS. Effect of healthy lifestyle interventions in schools of Jazan City, Kingdom of Saudi Arabia: a quasi-experimental study. *Arab Journal of Nutrition and Exercise*. 2020 Apr 30;5(1):1-4.
- Almutairi AF, Salam M, Alanazi S, Alweldawi M, Alsomali N, Alotaibi N. Impact of help-seeking behavior and partner support on postpartum depression among Saudi women. *Neuropsychiatric disease and treatment*. 2017 Jul 20:1929-36.
- Terranova CO, Brakenridge CL, Lawler SP, Eakin EG, Reeves MM. Effectiveness of lifestyle-based weight loss interventions for adults with type 2 diabetes: a systematic review and meta-analysis. *Diabetes, Obesity and Metabolism*. 2015 Apr;17(4):371-8.
- Aldisi D, Afsar T, Al-farraj AA, Alothman AF, Al-Mokhyel SH, AlQahtani SA, yousef Bakhsh M, Alenazy NA, Razak S, Elshafie MM, Almajwal A. Efficacy of Dietary Interventions on Weight Loss and Biochemical

- Parameters Among Saudi Females with Obesity and Overweight: An Interventional Non-Randomized Control Trail.
- Landry MJ, Bagha Z. Lifestyle management approaches for obesity. *Journal of Clinical Lipidology*. 2026 Jan 1;20(1):38-54.
- Jensen MD, Ryan DH, Apovian CM, et al. 2013 AHA/ACC/TOS guideline for the management of overweight and obesity in adults: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and The Obesity Society. *J Am Coll Cardiol* . 2014;63(25 Part B):2985–3023 .
- AlAteeq MA, AlHomayed N, AlBuraikan D, AlFageer H. Attitudes toward obesity, willingness to lose weight, and treatment preferences among overweight and obese Saudi adults. *Cureus*. 2022 Sep 16;14(9).
- Alshaikh AM, Alshaikh AA, Alatawi HS, Alshaikh JA, Alshaikh OM, Yusuf MH. Barriers to Lifestyle Modification and Willingness to Join Weight Loss Programs Among Overweight or Obese Adults in Saudi Family Medicine Clinics. *Cureus*. 2025 Jun 17;17(6).
- Alharbi MM, Jackson RT. Perceived Barriers to Maintaining Healthy Body Weight among Saudi Women of Reproductive Age in Jeddah City. *J Obes Overweig* 3 (2): 202. doi: 10.15744/2455-7633.3. 202 Abstract Keywords. *Obesity*. 2017.
- Gardner CD, Vadiveloo MK, Petersen KS, et al. Popular dietary patterns: alignment with American Heart Association 2021 dietary guidance: A scientific statement from the American Heart Association. *Circulation* . 2023 .
- Hauser ME, Hartle JC, Landry MJ, et al. Association of dietary adherence and dietary quality with weight loss success among those following low-carbohydrate and low-fat diets: a secondary analysis of the DIETFITS randomized clinical trial. *Am J Clin Nutr* . 2024;119(1):174– 184.
- Gibson AA, Sainsbury A. Strategies to improve adherence to dietary weight loss interventions in research and real-world settings. *Behav Sci (Basel)* . 2017;7(3):44 .
- Lemstra M, Bird Y, Nwankwo C, Rogers M, Moraros J. Weight loss intervention adherence and factors promoting adherence: a meta-analysis. *Patient preference and adherence* . 2016:1547–1559.
- Walker RE, Gordon M. The use of lifestyle and behavioral modification approaches in obesity interventions for black women: a literature review. *Health Education & Behavior*. 2014 Jun;41(3):242-58.
- Alqurashi RM, Abdalla SM, Ammar AB, Shatwan IM, Alsayegh AA, Alnasser AN, Alfadhliah JT, Fallata GA, Alhumaidan OA, Bawazeer NM. Food consumption patterns in different regions of the Kingdom of Saudi Arabia: household cross-sectional study. *Applied Food Research*. 2025 Jun 1;5(1):100666.
- Dietary Guidelines Advisory Committee. *Scientific report of the 2020 dietary guidelines advisory committee: advisory report to the secretary of agriculture and the secretary of health and human services* . Washington, DC: U.S. Department of Agriculture, Agricultural Research Service; 2020 .
- Alfahmi AS, Alghamdi MS, Alnashri FM, Almarjan AY, Alotaibi WT, Shatla MM. The prevalence and pattern of physical activity and its relation to socio-demographic correlates among the population in Makkah, Saudi Arabia. *risk*. 2018;2018(2030).
- Gostoli S, Raimondi G, Popa AP, Giovannini M, Benasi G, Rafanelli C. Behavioral lifestyle interventions for weight loss in overweight or obese patients with type 2 diabetes: a systematic review of the literature. *Current Obesity Reports*. 2024 Jun;13(2):224-41.