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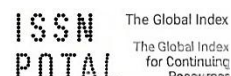
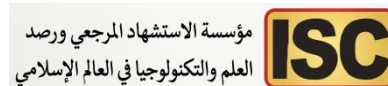
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A Comparative Analysis of Sedentary Behavior and Dietary Behavior in Relation to Dental Caries Among Resistance Trained Men

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Abstract

This comparative cross-sectional research design aims to evaluate sedentary behavior and dietary behavior in relation to dental caries. The population of this work are gym members and general participants. A self-administered questionnaire was submitted to 100 gym members and 100 general participants selected based on inclusion and exclusion criteria. The Adolescent Sedentary Activity Questionnaire was used to measure a sedentary lifestyle. Investigations were conducted into the frequency of taking protein supplements and their correlation with dietary practices. Caries experience was diagnosed and taken based on the missing, decayed, and filled index (DMF index for permanent teeth) according to criteria described by WHO (2013) utilizing dental mirror and community

periodontal index probe (CPI). The results indicate that compared to supplement users (SU), non-supplement users (NSU) eat substantially more baked goods and snacks ($p < 0.001$). On the other hand, SU consumes much more meat, chicken, and nuts ($p < 0.001$). Caries experience increased with increase sedentary behavior in both groups, but with no significant difference except in study group in MS, its result is significant difference.

Keywords: Dental caries, Sedentary behavior, Dietary behavior

Introduction

Sedentary lifestyles are linked to modest physical activities or activities that need to expend 1 to 1.5 metabolic equivalents (METs) of energy or at the level of resting physical activity (Zhang et al., 2016). A higher chance of death and non-communicable diseases can result from physical inactivity, which can also negatively impact physical fitness (McDermott et al., 2011). The detrimental consequences of a sedentary lifestyle or lack of exercise include a higher risk of obesity, high blood pressure, weakened muscles, and a quicker rate of fatigue (Elagizi et al., 2018).

Due to a decrease in Lipoprotein Lipase (LPL) activation, which in turn reduces circulating HDLC concentration and triglyceride absorption, a sedentary lifestyle can be a contributing

factor to cardiovascular disease. Reduced absorption of HDLC and triglycerides can raise the risk of deep vein thrombosis, impairing the heart's and lungs' ability to function (Delva et al., 2006). Additionally, the metabolic syndrome can be affected by a sedentary lifestyle. A substantial reduction in the activation of Lipoprotein Lipase (LPL), an enzyme that controls lipid metabolism, in muscles is the physiological mechanism behind the association between metabolic syndrome and a sedentary lifestyle. Numerous studies have demonstrated that after a little period of immobility, inactivity can significantly lower LPL activity in skeletal muscle. In muscle fibers that are seldom manipulated, immobilization has been demonstrated to decrease the activity of LPL by as much as 10% of its typical level. Sedentary lifestyles can also increase the risk of metabolic syndrome because they lead to low energy expenditure, which lowers physical fitness levels and causes overweight or obesity (Costigan et al., 2013). Physical activity levels among people with high BMI can vary greatly; some may be largely inactive while others may continue to be active despite their excess weight. Compared to people who only have one of these risk factors, those who are physically inactive and obese or overweight typically display the most sedentary behaviors and associated metabolic risks (Edwardson et al., 2012; Ekelund et al., 2016; Wijndaele et al., 2011).

Dental Caries

One chronic oral condition that can significantly harm a person's health is dental caries (Cheng et al., 2022). It happens when oral microbiota (acidogenic bacteria), food (fermentable carbohydrates), time, and host interact; the end effect is demineralization of the tooth's inorganic component when the organic material dissolves (Pitts & Zero, 2016). In addition to being a universal disease that affects 95% of people of all ages, its prevalence and severity vary in different communities (Ditmyer et al., 2011). Regardless of gender, it affects people of all races and age groups (Koch et al., 2017). Despite advancements in oral health, because oral health issues are so contagious and widespread, they persist on a global scale (Abdalla et al., 2023; Bakhsh et al., 2021). An analysis by the WHO revealed that 621 million teenagers worldwide are affected by oral diseases, which are considered lifelong conditions. The formation of the condition is related to the interaction of a large number of cariogenic oral microorganisms (Jaddoa & Qasim, 2020).

(Lima et al., 2023) reported that about 78.72% of athletes had a high risk of dental caries, and (Gallagher et al., 2018) reported a 49.1% occurrence of dental caries in the athletes. This finding comes from the relationship that is revealed when good nutritional health gives good oral health (AL-Nassary & Mohammed, 2019).

One of the most prevalent dental health issues that individuals now face worldwide is dental caries. It is a chronic infectious disease associated with the interplay of behavioral, biological, and socioeconomic factors (Athab, 2024).

The buildup of a microbial biofilm on teeth is the initial cause of dental plaque-induced gingivitis, which may appear as a range of visible symptoms and signs of inflammation localized in the gingiva (Al Najjar & Hussein, 2019).

In teenagers, gingivitis is one of the most common and widespread oral conditions (AlMujamii & Hussein, 2019).

Dietary Assessment

Food is vital to human existence because it gives us the energy and nutrients, we need to stay healthy and safe. A well-balanced diet that includes the right amounts of fat, protein,

carbohydrate, vitamins and minerals give the body a healthy supply of energy. An imbalanced diet occurs when the daily dietary intake is either too high or too low compared to the daily energy expenditure. As a result, eating an unbalanced diet causes underweight or obesity, which can lead to a number of health issues (Obici et al., 2002).

However, the main factors influencing childhood and adult obesity are an increase in energy intake and a decrease in physical activity (DeChelbaum, 2001). As a result, diet plays a significant role in the development of numerous non-communicable diseases, including cancer, diabetes, and cardiovascular disorders.

To make dietary recommendations to various populations with varying health conditions and nutritional status, dietary assessment methods are crucial (Rupasinghe et al., 2020).

Materials and Method

This research is a cross-sectional comparative study. The population of this work are gym members and general practitioners. Sampling utilizing a purposive sampling technique with a sample of 100 gym members who took a protein supplement and 100 general practitioners who did not take a protein supplement, selected according to exclusion and inclusion criteria. The hiring process was conducted in Baghdad through government departments and national clubs' training. All procedures were approved by The Research Ethics Committee of the College of Dentistry, University of Baghdad.

Sample size:

Using G power 3.1.9.7 (Program written by Franz-Faul, University of Kiel, Germany) With power of study=90%, alpha error of probability=0.05 two-sided, effect size of Cohen D is 0.5 (medium effect size), two groups, with all these conditions the sample size is about 200 subjects (100 subjects for each group). Effect size D are: Small =0.3, medium=0.5, large=0.8

Body Composition Measurement

Utilizing a combined electronic scale and stadiometer, participants were measured for height to the nearest 0.1 cm and weighed to the nearest 0.01 kg while wearing very little clothing and no shoes. The Momax smart scale is a digital body composition monitor that provides comprehensive health metrics through the use of Bioelectrical Impedance Analysis (BIA). besides measuring body weight, it can estimate muscle mass, body fat percentage, bone mass, body water, and body mass index (BMI). When a person stands barefoot on the scale, a small and safe electrical current pass through the body. Since fat, muscle, and water conduct electricity in a different way, the scale analyzes the resistance (impedance) to calculate body composition. It is often connected to a smartphone app via Bluetooth to store and monitor progress.

Sedentary Behavior Measurement

The Adolescent Sedentary Activity Questionnaire was used to measure a sedentary lifestyle. The PACE-Sedentary Behavior Questionnaire (SBQ) (Rosenberg et al., 2010) was utilized to calculate the average amount of time spent engaging in sedentary activities (without distinguishing between weekdays and weekends). The questionnaire was self-administered, meaning that participants completed it on their own without interviewer assistance. Participants are asked to estimate the amount of time they spend engaging in a range of sedentary activities, such as using a cell phone, listening to music, playing video games, using computers, watching television, creating crafts or artwork, playing an instrument, reading, working on paperwork, and driving or sitting in a train, bus, or car. Total screen time was determined by adding up the

amount of time spent on various activities, such as playing video games on the computer, using a cell phone, and watching television.

Food Classification

Foods were divided into three groups according to their protein content: high, medium, and low. Foods with ≤ 10 g of protein per 100 g are considered low content, those with 10–20 g per 100 g are considered medium, and foods with 20–25 g or more are considered high content. Results for the protein percentage of each food item were obtained from the database maintained by the INRAN (Istituto Nazionale di Ricerca per gli Alimenti e la Nutrizione) (Bianco et al., 2014). The researchers used a questionnaire to collect data on the participants' dietary habits, supplement use frequency, and other relevant factors (Eldridge & Sheehan, 1994) (Additional file 1).

Inter and intra examiner calibration

Both inter-and intra-examiner calibration were accomplished in the College of Dentistry, University of Baghdad, to verify data recording consistency. Inter examiner calibration was conducted on 10 individuals of varying ages, who underwent two examinations: the initial assessment was performed by the researcher, followed by a second assessment conducted by a specialist (supervisor) in the department of pedodontics and preventive dentistry. The assessment encompassed tooth caries and bleeding on probing (BOP).

Intercalibration of studied variables for the intraclass correlation coefficient for decayed surface (DS), missing surface (MS), filled surface, decayed,missing and filled surfaces, and BOP are 0.880, 0.805, 0.877, 0.856, and 0.900, respectively, while for intracalibration are 0.901, 0.932, 0.885, 0.877, and 0.933, respectively.

Results

Results in Tables 1 and 2 show that nutritional parameters increased with sedentary behavior in both groups with no significant difference except in fat percentage in control group, its result is significant using Games Howell, all results are not significant between group of sedentary behavior except between (5-10) hours with (17-22) hours, this result is significant difference. Muscle mass in both groups although decreased with increased sedentary behavior but with no significant difference.

Table 1. Descriptive and statistical test of nutritional assessment among sedentary behavior.

		< 5h		5-10 h		11-16 h		17-22 h		F	p value
		Mean	$\pm$ SD	Mean	$\pm$ SD	Mean	$\pm$ SD	Mean	$\pm$ SD		
Control	Weight			86.711	17.585	95.707	23.066	94.718	20.476	1.273	0.284
	Height			174.842	7.566	177.244	8.429	173.842	6.977	2.031	0.137
	BMI			28.341	5.605	30.255	5.745	31.326	6.406	1.580	0.211
	Muscle mass			43.542	3.708	43.191	4.820	41.016	5.901	2.402	0.096
	% fat			24.353	6.511	26.195	7.269	29.847	10.075	3.337	0.040*
Study	Weight	81.604	9.270	83.982	11.516	91.030	11.234			2.570	0.082
	Height	176.348	6.610	175.940	5.903	179.200	6.630			1.226	0.298
	BMI	26.237	2.564	27.115	3.380	28.253	1.969			1.553	0.217

	Muscle mass	48.074	3.278	47.184	3.345	46.140	2.116			1.343	0.266
	% fat	19.422	3.951	20.751	4.201	22.270	3.278			1.854	0.162

Table 2. Multiple pairwise comparison of fat percentage using Games-Howell.

Groups	SB (hr)		Mean Difference (I-J)		p value
Control	5-10 h	11-16 h	-1.843		0.587
		17-22 h	-5.495		0.043
	11-16 h	17-22 h	-3.652		0.162

Findings in Table 3 show that caries experience of permanent teeth by surfaces is higher in the study group than in the control group, with a significant difference, except in MS, where the result is not significant.

Table 3. Descriptive and statistical test of caries experience among groups.

	Control		Study		T test	P value
	Mean	±SD	Mean	±SD		
DS	5.870	1.463	10.150	1.742	4.896	0.000*
MS	1.440	0.293	2.550	0.494	1.931	0.055
FS	1.660	0.248	4.450	0.582	4.408	0.000*
DMFS	8.970	0.607	17.150	1.030	6.844	0.000*

Findings in Tables 4 and 5 show that although caries experience increased with increased sedentary behavior in both groups, there was no significant difference except in the study group in MS, where the result is a significant difference, using the Games-Howell post hoc test. Most results are not significantly different except between <5 hours and (5-10) hours; the result is a significant difference.

Table 4. Descriptive and statistical test of caries experience among sedentary behavior.

		< 5h		5-10 h		11-16 h		17-22 h		F	P value
		Mean	±SD	Mean	±SD	Mean	±SD	Mean	±SD		
Control	DS			4.421	0.762	6.000	0.752	6.447	0.776	1.251	0.291
	MS			1.263	0.477	1.163	0.435	1.842	0.547	.579	0.562
	FS			2.316	0.583	1.302	0.379	1.737	0.395	1.134	0.326
	DMFS			8.000	1.245	8.465	0.838	10.026	1.124	.967	0.384
Study	DS	11.826	1.687	9.642	0.906	9.700	1.814			.759	0.471
	MS	0.391	0.272	2.522	0.535	7.700	2.879			8.819	0.000
	FS	3.217	0.703	4.612	0.765	6.200	2.235			.993	0.374
	DMFS	15.435	1.679	16.776	1.284	23.600	3.787			2.390	0.097

Table 5. Multiple pairwise comparison of MS using Games-Howell.

Groups	SB		Mean Difference (I-J)	p value
Study	< 5 h	5-10h	-2.131	0.002
		11-16h	-7.309	0.075
	5-10h	11-16h	-5.178	0.231

Findings in Table 6 show that correlation between nutritional parameters and caries experience, the only significant correlation in control group between DS and weight, its result is weak negative, in study group, the significant correlation finds between BMI and % fat with MS, these results are positive weak while the muscle mass is negative weak.

Table 6. Correlation between caries experience and nutritional assessment.

Groups		DS		MS		FS		DMFS	
		r	p	r	p	r	p	r	p
Control	Weight	-0.219	0.029	0.067	0.510	-0.056	0.580	-0.157	0.118
	Height	-0.178	0.076	0.221	0.027	0.126	0.210	0.023	0.823
	BMI	-0.167	0.097	-0.026	0.795	-0.110	0.277	-0.185	0.066
	Muscle mass	0.143	0.155	-0.012	0.905	-0.039	0.700	0.088	0.387
	% fat	-0.147	0.143	-0.027	0.792	-0.031	0.758	-0.138	0.171
Study	Weight	-0.055	0.589	0.254	0.011	0.123	0.221	0.152	0.131
	Height	0.008	0.936	0.084	0.406	0.077	0.449	0.090	0.376
	BMI	-0.062	0.540	0.244	0.015	0.084	0.407	0.120	0.236
	Muscle mass	0.137	0.174	-0.211	0.035	-0.017	0.868	-0.012	0.904
	% fat	-0.148	0.143	0.213	0.034	0.072	0.475	0.037	0.718

Results in Table 7 show that study group consume less low protein food than those of control groups with significant results in bakery, snack and in the total subjects. The only significant result in medium protein food is with nuts as that study group consume more nuts than control. In high protein food the significant results are with chicken and meat are more in study group than control group and no significant results in eggs, cold cuts and fresh fish.

Table 7. Distribution of food intake among groups.

Protein intake	Cats.	Control		Study		Chi square p value		
		N.	%	N.	%		N.	%
Low protein	Milk	41	41.00	44	44.00	0.668	85	42.50
	Bakery	81	81.00	48	48.00	0.000	129	64.50
	Snack	81	81.00	49	49.00	0.000	130	65.00
	Yogurt	56	56.00	57	57.00	0.887	113	56.50
	Total	98	98.00	85	85.00	0.001	183	91.50
Medium protein	Legume	50	50.00	61	61.00	0.118	111	55.50
	Cheese	64	64.00	63	63.00	0.883	127	63.50
	Nuts	40	40.00	75	75.00	0.000	115	57.50
	Total	83	83.00	90	90.00	0.147	173	86.50
High protein	Chicken	83	83.00	97	97.00	0.001	180	90.00
	Eggs	88	88.00	85	85.00	0.535	173	86.50

	Meat	64	64.00	94	94.00	0.000	158	79.00
	Fresh fish	69	69.00	79	79.00	0.107	148	74.00
	Cold cuts	28	28.00	27	27.00	0.874	55	27.50
	Total	97	97.00	97	97.00	0.999	194	97.00

Results in Table 8 show that when comparing between groups of protein intake in each group (control and study), weight and BMI are more in high protein intake in control group mostly but with no significant difference while low protein intake subjects have more % fat in control subjects than high protein intake but with no significant difference while in study subjects, % fat is more in high protein intake than low protein but with no significant difference. When comparing the control and study groups in each protein intake, weight, BMI, and % fat are higher in the control than in the study group with significant differences, while muscle mass is higher in the study group than in the control group with significant differences.

Table 8. Descriptive and statistical test of nutritional parameters among food intake and groups.

Vars.	Groups	Protein intake				T test	p value
		Low		High			
		Mean	±SD	Mean	±SD		
Weight	Control	93.512	21.246	93.610	21.265	0.032	0.974
	Study	83.341	11.481	83.774	11.012	0.259	0.796
T test and p value		4.099	0.000	4.045	0.000		
Height	Control	175.546	7.895	175.531	7.940	0.013	0.989
	Study	176.388	6.126	176.268	6.131	0.132	0.895
T test and p value		0.811	0.418	0.724	0.470		
BMI	Control	30.241	5.996	30.276	5.990	0.041	0.967
	Study	26.756	3.194	26.943	3.124	0.399	0.691
T test and p value		4.995	0.000	4.860	0.000		
Muscle mass	Control	42.450	5.151	42.506	5.190	0.076	0.940
	Study	47.531	3.262	47.353	3.260	0.367	0.714
T test and p value		8.074	0.000	7.788	0.000		
%fat	Control	27.197	8.515	27.147	8.584	0.040	0.968
	Study	20.329	4.054	20.493	4.083	0.270	0.787
T test and p value		7.109	0.000	6.895	0.000		

Findings in Table 9 show that mostly caries experience in each group are higher in low protein intake than those with high protein intake but with no significant difference, in each groups of protein intake, caries experience is greater in study than those in control with significant difference in DS, FS, DMFS while no significant difference in MS in low protein intake while significant in high protein intake.

Table 9. Descriptive and statistical test of caries experience among food intake and groups.

Vars.	Groups	Protein intake				T test	p value
		Low		High			
		Mean	SD	Mean	SD		
DS	Control	5.867	0.472	5.784	0.469	0.126	0.900
	Study	9.988	0.820	10.206	0.758	0.195	0.845

T test and p value		4.354	0.000	4.959	0.000		
MS	Control	1.449	0.299	1.361	0.288	0.212	0.832
	Study	2.412	0.533	2.526	0.503	0.156	0.877
T test and p value		1.576	0.117	2.010	0.046		
FS	Control	1.622	0.246	1.639	0.248	0.048	0.962
	Study	4.518	0.632	4.464	0.598	0.062	0.951
T test and p value		4.266	0.000	4.362	0.000		
DMFS	Control	8.939	0.615	8.784	0.616	0.178	0.859
	Study	16.918	1.103	17.196	1.054	0.182	0.856
T test and p value		6.315	0.000	6.893	0.000		

Discussion

This study sought to examine the correlation between sedentary behavior and dietary habits among gym members and the general population, specifically emphasizing the impact of this correlation on body composition and dental caries prevalence.

Previous studies show a sedentary lifestyle increases the risk of developing health conditions such as obesity and cardiovascular diseases. An example is (Elagizi et al., 2018) who documented that sedentary behavior is linked to increased body fat and poor cardiovascular health. Their findings corroborate the previous studies where participants who had long sedentary durations had a lower muscle mass and higher percentages of fat which confirms the impact of inactivity.

This study employed a cross-sectional study design. To improve the generalizability of the findings, future studies should use longitudinal design to capture changes over time and analyze wider population subsets. Analyzing the psychological aspects of sedentary behavior will contribute additional insights into the phenomenon.

As documented in (McDermott et al., 2011) higher sedentary time is associated with poor function and physical fitness, the negative relationship between physical fitness and sedentary behavior is confirmed. Participants who exhibited higher levels of sedentary behavior were found to have a lower muscle mass and higher fat percentages. This study helps in documenting the major consequences of inactivity which includes poor fitness levels and muscle strength.

There is also evidence linking sedentary behavior and dental caries. One study (Costigan et al., 2013) documents sedentary behavior being associated, in some cases, with poor eating habits that include increased consumption of sugary beverages and snacks. Such eating patterns are conducive to tooth decay, especially in sedentary populations. Studies that examine the relationship between body mass index and dental caries in adults are few and have produced conflicting outcomes. A positive relationship has been reported in some studies (Barrington et al., 2019) whereas others have reported no relationship (Idrees et al., 2017; Kabbarah et al., 2025) or a negative relationship (Song et al., 2017).

In our study, the gym members demonstrated a higher incidence of dental caries, which may be influenced by lifestyle factors, including their activity levels and dietary habits. This is consistent with findings from (Elagizi et al., 2018), who noted that sedentary lifestyles among athletes can lead to an increased risk of dental issues due to poor oral hygiene and dietary choices. The body's responses to harmful forces, infections, and other abnormal states that threaten to disrupt its

normal physiological balance are collectively known as stress. Therefore, general and oral health are negatively impacted by any physiological, psychological, social, or environmental event or stimulus, whether actual or imagined (Abdul-Ameer et al., 2017). Stress may connect with several pathologies of the oral cavity (Kadhum & Qasim, 2020).

Compared to participants who did not take supplements, The frequency with which snacks and baked goods are consumed is another important finding. Both groups' consumption was comparatively high, but the non-protein supplement groups was noticeably higher.

Our study also suggests a link between dietary practices and the prevalence of dental caries, particularly among gym members. Previous research, including Costigan et al. (2013), noted that sedentary behaviors and poor dietary choices, especially the consumption of sweet snacks and drinks, are often intertwined. This also fits with our findings indicating that gym members, despite being physically active, may engage in eating behaviors that are deleterious to their dentition.

Although the results suggest that gym members experience more dental caries than the rest of the population, it is questionable what their eating habits are like. This is contrary to the belief that, as a result of their training, athletes, are likely to adopt a more health conscious diet. It also implies that greater intake of protein supplements is not necessarily good for your teeth.

Our studies on protein consumption suggest that high-protein diet practitioners have not experienced fewer dental caries than those with low protein consumption. Bianco et al. (2014) suggest that increased consumption of protein improves health and dental health, which is contrary to this study. This may be attributed to the type of protein consumed and overall dietary composition, highlighting the need to assess all aspects of diet and not merely individual macronutrients.

Saliva is made up of organic and inorganic compounds (Mahmood, 2024). The role of unstimulated saliva is extremely important for the maintenance of oral health and the general health of the oral cavity (Ali & Yas, 2025). An investigation carried out by (Yousif & Qasim, 2023) reported obesity as a possible causative factor for atypical characteristics of saliva which include low buffering capacity, high salivary flow rate, and elevated pH. These are all negative factors for the protection of the teeth. Due to the fact that saliva is produced in different quantities because of physiological factors related to an individual's nutritional status, diet may also indirectly contribute to an increase in dental caries.

Dental caries was more prevalent in the study groups than in the control groups in the current study. This is consistent with Obied Majhool and Ahmed Qasim (2024), who state that dental caries is more common among athletes.

Conclusion

In conclusion, participants with greater amounts of sedentary behavior had greater levels of body fat and dental caries. Even though participants were active, members of a gym, and had drives to the gym, they had more dental caries, which suggests poor nutrition may be a factor. Overall, the

findings indicate a need to improve levels of nutrition and physical activity to enhance health. The study highlights the connection between nutrition and dental health with increased protein consumption and lack of corresponding beneficial effects on dental health. Sedentary behavior is a major contributor to a multitude of health concerns, particularly obesity and cardiovascular disease, and this study once again confirmed the negative effects of sedentary behavior on physical and dental health.

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Declaration of Conflicting Interests

There are no conflicts of interest disclosed by the author.

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Limitations

It is important to keep in mind the study's limitations while analyzing its results:

1. Cross-Sectional Design: The cross-sectional design of this study limits our capacity to determine correlation among the analyzed variables.
2. Self-Reported Data: The reliance on self-reported data for dietary intake and supplement use may introduce reporting biases, which could affect the accuracy of the findings.
3. Oral Hygiene Considerations: Inadequate examination of oral hygiene practices and brushing frequency may influence the outcomes and limit the comprehensiveness of the analysis.
4. Participant Demographics: The study included only male participants, which may limit the generalizability of the results to a broader population.
5. Narrow Age Range: The narrow age range of participants restricts the applicability of the findings to other age groups, reinforcing the need for further research across more diverse age demographics.

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مكملت البروتين والسلوك الغذائي لدى الرجال الممارسين لتدريبات المقاومة وعلاقتها بصحة الفم ومكونات اللعاب

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المستخلص:

يهدف هذا البحث المقارن ذو التصميم المقطعي إلى تقييم السلوك الخامل والسلوك الغذائي وعلاقتهما بتسوس الأسنان لدى أعضاء الصالات الرياضية والمشاركين من عامة السكان. شملت الدراسة 200 مشارك، بواقع 100 من أعضاء الصالات الرياضية و100 من المشاركين من عامة السكان، تم اختيارهم وفقاً لمعايير الإدراج والاستبعاد. تم استخدام استبيان النشاط لتقييم السلوك الخامل، كما تم جمع المعلومات (Adolescent Sedentary Activity Questionnaire) الخامل للمراهقين المتعلقة بتكرار تناول مكملت البروتين وعلاقتها بالسلوك الغذائي. تم تقييم خبرة تسوس الأسنان باستخدام مؤشر الأسنان للأسنان الدائمة، وفقاً لمعايير منظمة الصحة العالمية (2013)، باستخدام مرآة الأسنان (DMF) المتسوسة والمفقودة والمحشوة (CPI). ومسبار مؤشر اللثة المجتمعي.

أظهرت النتائج أن المشاركين غير مستخدمي مكملت البروتين (NSU) استهلكوا كميات أكبر بشكل معنوي من المخبوزات والوجبات الخفيفة مقارنةً بمستخدمي المكملت ($p < 0.001$) (SU). في المقابل، استهلك مستخدمو المكملت كميات أكبر بشكل معنوي من اللحوم والدجاج والمكسرات مقارنةً بغير المستخدمين ($p < 0.001$). كما أظهرت النتائج زيادة في خبرة تسوس الأسنان مع زيادة السلوك الخامل في كلتا المجموعتين، إلا أن هذا الارتباط لم يكن ذا دلالة إحصائية في معظم المقارنات، باستثناء جزء الأسنان المفقودة (MS) في مجموعة الدراسة، حيث ظهر فرق ذو دلالة إحصائية. الكلمات المفتاحية: تسوس الأسنان، السلوك الخامل، السلوك الغذائي.

Appendix

القسم الاول: المعلومات الديموغرافية

وحدة البحوث	رقم المشاركة.....	التاريخ:
الاسم:	العمر (بالسنوات) :	
الجنس: ذكر / انثى	الطول (سم)	
الوزن (كغم)	رقم الهاتف	

المستوى التعليمي :

- ☐ شهادة المدرسة الاعدادية
- ☐ شهادة المدرسة الثانوية
- ☐ شهادة البكالوريوس
- ☐ شهادة الدبلوم
- ☐ شهادة الماجستير
- ☐ شهادة الدكتوراه

القسم الثاني: تحليل النشاط البدني

* هل تمارس اي أنشطة بدنية؟ نعم / لا

- اذا كانت الاجابة نعم ما نوع النشاط الذي تمارسه؟ _____

- منذ متى (بالشهور) _____

- كم عدد الايام في الاسبوع؟ _____

- كم عدد الساعات في اليوم؟ _____

- اذكر جميع الاماكن التي تمارس فيها الانشطة البدنية:

القسم الثالث: استخدام مكملات البروتين

* هل تستخدم مكملات البروتين؟ نعم / لا

اذا كانت الاجابة لا هل سبق لك استخدامها في الماضي؟ نعم / لا

اذا كانت الاجابة نعم, ماهي؟ اذا امكن, اذكر العلامة التجارية _____

منذ متى (شهور / سنوات) _____

كم عدد الايام في الاسبوع؟ _____

ماهو النوع (في اليوم)؟ *بار بروتين (العدد)

*بروتين مصل اللبن/الببيض/مزيج البروتين

*مشروب البروتين (مل)

يخلط غالبا مع:

الحليب / الماء

هل تتناول مكملات البروتين مع مواد أخرى مثل الكرياتين، الأحماض الأمينية، الفيتامينات، المنشطات؟

اكتب هنا

من الذي اقترح عليك استخدامها؟

- ☐ المدرب
- ☐ أنا، كانت فكرتي
- ☐ الإنترنت
- ☐ الطبيب
- ☐ أخصائي التغذية
- ☐ الأصدقاء
- ☐ أخرى

القسم الرابع: تحليل النظام الغذائي

هل تتبع نظاما غذائيا محددا؟ نعم / لا إذا كانت الإجابة نعم اذكر اسم النظام هنا

عدد مرات استخدام الأطعمة التالية

نوع الطعام	يومية	اسبوعيا
الحليب		
الجبن		
الدجاج		
الديك الرومي		
البيض		
الخضروات		
الخبز		
اللحوم المبردة		
الزبادي		
اللحوم		
الأسماك		
المكسرات		
الوجبات الخفيفة		
التونة المعلبة		
البقوليات		
منتجات الألبان عالية الدسم		
منتجات الألبان قليلة الدسم		

القسم الخامس: استبيان السلوك الخامل

النشاط	المدة
مشاهدة الفيديوها أو التلفزيون أو الأفلام بغض النظر عن المصدر-الهاتف، الكمبيوتر، (التلفزيون)	ساعة () دقيقة ()

ساعة () دقيقة ()	لعب العاب. الفيديو/ الكمبيوتر
ساعة () دقيقة ()	تصفح الانترنت او استخدام وسائل التواصل الاجتماعي للترفيه
ساعة () دقيقة ()	اداء الواجبات المنزلية / الدراسة
ساعة () دقيقة ()	القراءة من اجل التسلية
ساعة () دقيقة ()	الجلوس والتحدث مع العائلة او الاصدقاء شخصيا او عبر الانترنت
ساعة () دقيقة ()	الاستماع الى القران او الراديو او الموسيقى (دون القيام بأي نشاط اخر)
ساعة () دقيقة ()	الراحة(الاستلقاء دون اخذ قيلولة)
ساعة () دقيقة ()	ممارسة هوايات تتطلب التفكير / المنطق مثل حل الالغاز, لعب الورق, حل الكلمات المتقاطعة الخ...
ساعة () دقيقة ()	القيام بأعمال يدوية بسيطة او فنية اثناء الجلوس مثل الرسم, التلوين, الحياكة, الخياطة الخ...
ساعة () دقيقة ()	استخدام وسائل النقل اثناء الجلوس (في الدراجة النارية أو المترو، القطار، الحافلة، السيارة،)
ساعة () دقيقة ()	القيام بالأعمال المنزلية اثناء الجلوس (مثل تقطيع الأطعمة، الكي، الطهي)
ساعة () دقيقة ()	الانخراط في أنشطة أخرى غير المذكورة اعلاه اثناء الجلوس, اذكره

University of Baghdad
College of Dentistry



Research Ethics
Committee

Ref. number: 965

Date: 10-11-2024

Decision of the Research Ethics Committee

To Sarah Bassil Abdulwahid and Assist. Prof. Alhan Ahmed Qasim

The Research Ethics Committee of the College of Dentistry, University of Baghdad has reviewed the submitted research project outlined below for ethical approval.

Project No.	965324
Project title	Protein Supplement and Dietary Behavior of Resistance Trained Men in Relation to Oral Health Condition and Salivary Components
Decision	Approved

This decision was made based on the following submitted items that have been received and reviewed by the committee:

- Study protocol.
- Application form and checklist for research that involves human subjects (if applicable).
- Patient information sheet and consent form (if applicable).
- Application form and checklist for research that involves animal experiments (if applicable).

Salwan Bede

Prof. Dr. Salwan Y. Bede BDS, FIBMS

Chairman of the Research Ethics Committee

Email: ethical.approval@codental.uobaghdad.edu.iq