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Health-Related Factors and Nutritional Supplement Use among Tehranian Gym Participants

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INTRODUCTION

➤ History of nutritional supplement (NS) use, goes back to **ancient Greek times.**

(Mangi & Jokl, 1981)

➤ NS use has increased **worldwide** among **general population, gym participants & athletes** and has become a **widespread & acceptable behavior.**

(Dascombe et al., 2010; de Silva *et al.*, 2010; Kim et al., 2010; Najmabadi & Nojomi, 2010; Molinero & Marquez, 2009; Skeie *et al.*, 2009; Erdman et al., 2007)

➤ NS are **ingredients** such as vitamins, minerals, amino acids & herbs in a concentrated form, which are available in **normal & balanced diet.**

(Radimer et al., 2004; DSHEA, 1994 ; Van Thuyne *et al.*, 2006)

- There are **disagreements** about the **health benefits** of NS use.
(Huang *et al.*, 2006)
- There is no comprehensive information among Tehranian gym participants.

Therefore, the aim of this study was to determine:

1. **Associated factors** with NS use among gym participants
2. **Contribution** of associated factors toward NS use among gym participants

Understanding the **factors** which may **drive** the NS use
Would help **health professionals** to educate users about the
benefits/risks of NS.

➤ NS users were more likely than non-users to be female &
younger.

(Kim et al., 2010; Goston & Correia, 2010; Najmabadi & Nojomi, 2010; Gunther et al., 2004)

➤ NS users were more likely than non-users to have
high/moderate physical activity level (PAL), disordered eating,
being current/ex-smoker.

(Kim et al., 2010; Gardiner et al., 2007; Beitz et al., 2004; Wichstrom & Pedersen, 2001)

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MATERIALS & METHODS

Study Location

Tehran's fitness clubs

Study Design

Case-control study design

Study Population

Tehranian fitness clubs' participants

Sample Size Estimation

$$n = \frac{\left[z_{1-\alpha/2} \sqrt{2\bar{P}^*(1-\bar{P}^*)} + z_{1-\beta} \sqrt{P_1^*(1-P_1^*) + P_2^*(1-P_2^*)} \right]^2}{(P_1^* - P_2^*)^2}$$

$$n = 123 + 20\% = 147$$

Lemeshow *et al.*, 1990**Gym's Selection Criteria**

- ✓ **Inclusion Criteria:** 1. Having male & female participants
2. Having regular fitness programs
- ✓ **Exclusion Criteria:** 1. Only for male & or female
2. Only have professional fitness & exercise programs

NS Users' Selection Criteria

- ✓ **Inclusion Criteria:** Using NS in previous 6 months, ≥ 18 years old, Exercise at least 3 times/w & Iranian citizen
- ✓ **Exclusion Criteria:** <18 years old, Exercise Less than 3 times/w & using illegal substances

Non-Users' Selection Criteria

- ✓ **Inclusion Criteria:** Did not use NS in previous 6 months, ≥ 18 years old, Exercise at least 3 times/w & Iranian citizen
- ✓ **Exclusion Criteria:** <18 years old & Exercise Less than 3 times/w

Study Instrument

A validated pretested questionnaire (Persian) was used.

1. **Socio-Demographic Factors:** Age, Sex & Educational Level
2. **Health-Related Factors:** PAL, Eating attitude, Smoking status & body mass index (BMI).

Reliability & Validity of the Questionnaire

✓ **EAT-26**

In previous studies: (Gargari *et al.*, 2009; Nobakht & Dezkam, 2000)

✓ **IPAQ**

In previous studies: (Delavar *et al.*, 2008; Craig *et al.*, 2003)

✓ **Smoking**

In current study: Kappa (0.733-0.841)

Face Validity

30 participants were commented on language, level of understanding & overall format

Data Analysis

Chi-square test & Logistic regression analysis

Crude and adjusted odds ratio (OR) with 95% CI were calculated

Significance level: $p < 0.05$



RESULTS

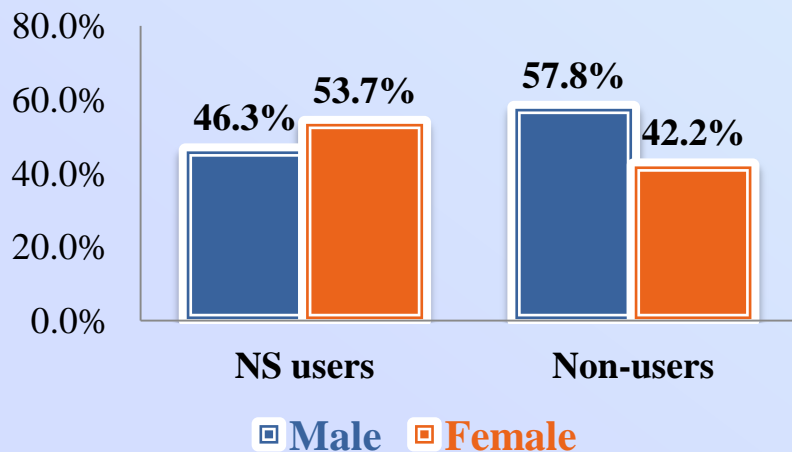


Figure 1: Distribution of NS users (n= 147) & non-users (n= 147) by sex

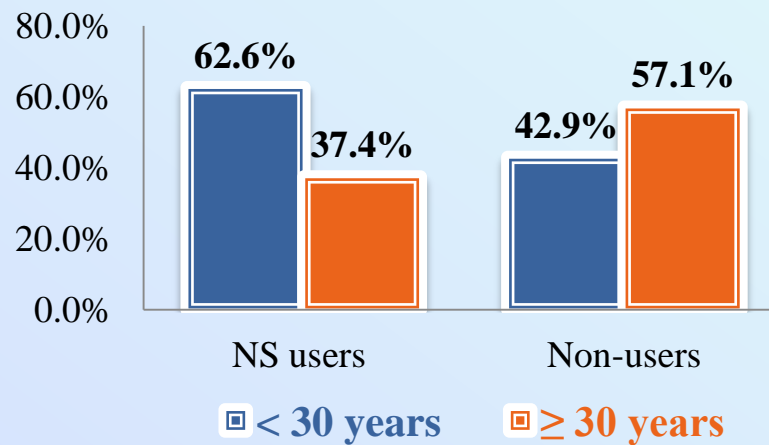


Figure 2: Distribution of NS users (n= 147) & non-users (n= 147) by age

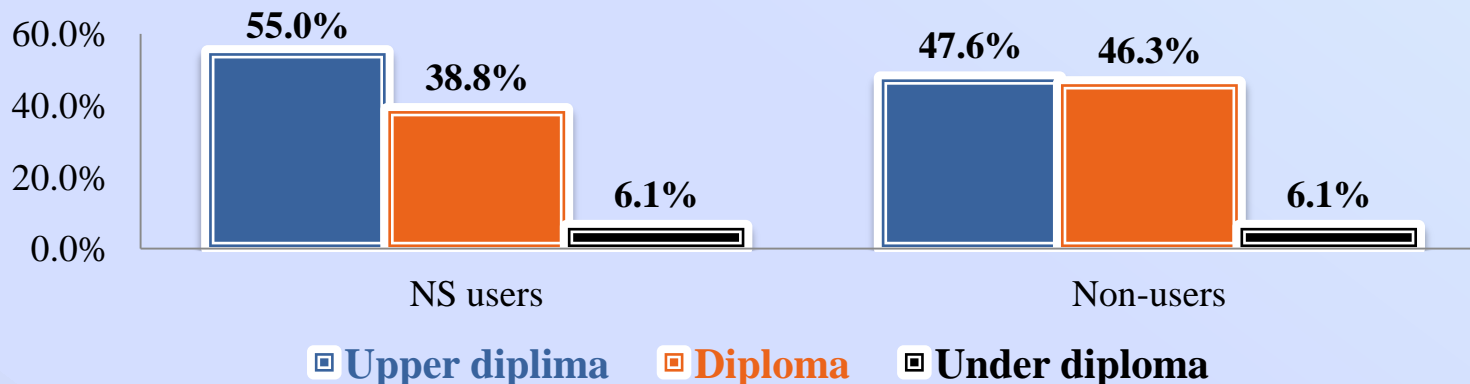


Figure 3: Distribution of NS users (n= 147) & non-users (n= 147) by educational level

Table 1: Association between NS use with socio-demographic factors

	NS users	Non-users	χ^2	Crude OR ^a (95% CI)
Age				
< 30 y	92(62.6)	63(42.9)	11.48*	2.23(1.40-3.56)
≥ 30 y ^b	55(37.4)	84(57.1)		1
Sex				
Male ^b	68(46.3)	85(57.8)	3.94*	1
Female	79(53.7)	62(42.2)		1.59(1.005-2.525)
Education				
Un.diploma ^b	9(6.1)	9(6.1)	1.77	1
Diploma	57(38.8)	68(46.3)		0.83(0.312-2.253)
Up.diploma	81(55.1)	70(47.6)		1.15(0.435-3.076)

* P< 0.05

^a OR= Odds Ratio

^b Reference group

Table 2: Association between NS Use with Health-Related Factors

	NS users	Non-users	χ^2	Crude OR ^a (95% CI)	Adjusted OR(95% (CI)
PA level					
Low ^b	1(0.7)	12(8.2)	10.51*	1	1
Moderate	121(82.3)	117(79.6)		12.41(1.58-96.95)	9.54(1.19-75.98)
High	25(17.0)	18(12.2)		16.66(1.98-139.97)	12.45(1.44-107.23)
Eating attitude					
No ED ^b	79(53.7)	112(76.2)	16.27*	1	1
Prone to ED	68(46.3)	35(23.8)		2.75(1.67-4.53)	3.57(2.07-6.14)
Smoking status					
Never ^b	75(51.0)	102(69.4)	10.34*	1	1
Ever	72(49.0)	45(30.6)		2.17(1.35-3.51)	5(2.58-9.66)
BMI					
UW/NW ^b	84(57.1)	87(59.2)	5.08	1	1
OW	47(32.0)	54(36.7)		0.90(0.55-1.47)	1.27(0.74-2.16)
OB	16(10.9)	6(4.1)		2.76(1.03-7.39)	3.94(1.40-11.10)

*P < 0.05

^aOR= Odds Ratio

^b Reference group

Table 3: Logistic Regression Analysis of NS Use

Factors	Adjusted OR	95% CI	P value
PA level			
Low ^b	1		
Moderate	16.60	1.75-157.44	0.014*
High	23.19	2.19-245.26	0.009*
Sex			
Male ^b	1		
Female	4.55	2.24-9.25	< 0.001*
Eating attitude			
No symptoms of ED ^b	1		
Prone to ED	3.03	1.67-5.51	<0.001*
Smoking			
Never Smoker ^b	1		
Current Smoker	5.77	2.68-12.40	< 0.001*
Ex-Smoker	4.71	1.78-12.49	0.002*
Age			
< 30	2.63	1.44-4.82	0.002*
≥ 30 ^b	1		
Educational Level			
Under diploma ^b	1		
Diploma	1.07	0.33-3.43	0.907
Upper diploma	1.48	0.45-4.83	0.508
BMI			
UW/NW ^b	1		
OW	1.12	0.61-2.05	0.695
OB	4.00	1.18-13.49	0.025*

^aOdds ratio, ^b Reference group

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**DISCUSSION &
CONCLUSIONS**

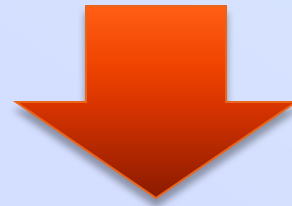
Associated Factors with NS Use	Current study	Other Studies		Explanation
		Researcher	Finding	
Physical Activity level (PAL)	NS users > non-users Moderate & High PAL	Kim et al., 2010; Gardiner et al., 2007; Gunther et al., 2004	<i>NS users > non-users</i> <i>Moderate & High</i>	High levels of PA *Increasing nutrient utilization *Increase losing nutrient through urine, sweat & feces ↓ Physically active people prefer to use NS
Sex	NS users > Non-user To be female	Kim et al., 2010; Najmabadi & Nojomi, 2010; Tscholl et al., 2010	<i>Female were more likely to use NS</i>	Opinions about health (enhancing immune system, preventing disease and medical deficiencies)
Eating attitude	NS users > Non-users To have disordered eating	Wichstrom & Pederson, 2001; Blouin & Goldfield, 1995	<i>Steroid users > non-users</i> <i>To have DE & higher bulimia score</i>	*ED & using steroids Unhealthy behaviors *NS users wanted to compensate their impaired EA & prevent nutritional deficiencies

Associated Factors with NS Use	Current study	Other Studies		Explanation
		Researcher	Finding	
Smoking Status	NS users > Non-users To be current/ex-smokers	Gardiner et al., 2007; Yussman et al., 2006; Gunther et al., 2004	NS users were more likely than non-users to be current/ex-smoker or using cigarette	*Reducing harmful effects of smoking and *Compensate for the lost nutrients
Age	NS users > Non-users To be less than 30 y	Najmabadi & Nojomi, 2010	55.6% of NS users were < 30 years old	*Young participants who generally consider healthy and try to stay in healthy condition. *Use NS for fitness, body shape & health maintenance
BMI	NS users > non-users To be obese	Gunther et al., 2004; Radimer et al., 2004	NS users > Non-users To be NW/UW	Self-reported body weight and height, for calculating BMI, in the current study

Conclusions

Female sex, age < 30, high levels of physical activity, having disordered eating, being a current/ex-smoker & being obese were all associated with NS use.

- ✓ NS users were more likely than non-users to have unhealthy behaviors



Close cooperation of **physicians, nutritionists and coaches** is needed to guide participants to follow a healthy lifestyle & consume a variety of foods instead of NS.

- ✓ More accurate techniques for assessing PA & eating attitude.

REFERENCES

- Blouin, A. G., & Goldfield, G. S. (1995). Body image and steroid use in male bodybuilders. *The International Journal of Eating Disorders*, 18(2), 159-165.
- Craig, C. L., Marshall, A. L., Sjostrom, M., Bauman, A. E., Booth, M. L., Ainsworth, B. E., et al. (2003). International physical activity questionnaire: 12-country reliability and validity. *Medicine and Science in Sports and Exercise*, 35(8), 1381-1395.
- Dascombe, B. J., Karunaratna, M., Cartoon, J., Fergie, B., & Goodman, C. (2010). Nutritional supplementation habits and perceptions of elite athletes within a state-based sporting institute. *Journal of Science and Medicine in Sport*, 13(2), 274-280.
- Delavar, M. A., Lye, M. S., Hassan, S. T. S., Khor, G. L., & Hanachi, P. (2008). Physical activity and the metabolic syndrome in middle aged women, Babol, Mazandaran province, Iran. *European Journal of Scientific Research*, 22(3), 411-421.
- de Silva, A., Samarasinghe, Y., Senanayake, D., & Lanerolle, P. (2010). Dietary supplement intake in national-level Sri Lankan athletes. *International Journal of Sport Nutrition and Exercise Metabolism*, 20(1), 15-20.
- Dietary Supplement Health and Education Act of 1994. (1994). Pub L No. 103-417. Retrieved June 10, 2010, from http://ods.od.nih.gov/about/dshea_wording.aspx#sec3.
- Erdman, K. A., Fung, T. S., Doyle-Baker, P. K., Verhoef, M. J., & Reimer, R. A. (2007). Dietary supplementation of high-performance Canadian athletes by age and gender. *Clinical Journal of Sport Medicine*, 17(6), 458-464.
- Gardiner, P., Kemper, K. J., Legedza, A., & Phillips, R. S. (2007). Factors associated with herb and dietary supplement use by young adults in the United States. *BMC Complementary and Alternative Medicine*, 30(7), 39.
- Gargari, B. P., Koushavard, D., Seyed Sajadi, N., Karami, S., & Shahrokhi, H. (2009). Risk of eating disorders in Tabrizian high school girls in 2007. *Medical Journal of Tabriz University of Medical Sciences*, 30(4), 21-26.
- Goston, J. L., & Correia, M. I. (2010). Intake of nutritional supplements among people exercising in gyms and influencing factors. *Nutrition*, 26(6), 604-611.
- Gunther, S., Patterson, R. E., Kristal, A. R., Stratton, K. L., & White, E. (2004). Demographic and health-related correlates of herbal and specialty supplement use. *Journal of the American Dietetic Association*, 104(1), 27-34.
- Huang, H. Y., Caballero, B., Chang, S., Alberg, A. J., Semba, R. D., Schneyer, C. R., et al. (2006a). The efficacy and safety of multivitamin and mineral supplement use to prevent cancer and chronic disease in adults: a systematic review for a National Institutes of Health state-of-the-science conference. *Annals of Internal Medicine*, 145(5), 372-385.

REFERENCES

- Kim, J., Lee, J. S., Shin, A., Kang, M. H., Shin, D. S., Chung, H. R., et al. (2010). Sociodemographic and lifestyle factors are associated with the use of dietary supplements in a Korean population. *Journal of Epidemiology*, 20(3), 197-203.
- Lemeshow, S., Hosmer, D. W. Jr., Klar, J., & Lwanga, S. K. (1990). *Adequacy of sample size in health studies*. Hoboken, NJ: John Wiley and Sons.
- Mangi, R. J., & Jokl, P. (1981). Drugs and sport. *Connecticut Medicine*, 45(10), 637-641.
- Molinero, O., & Marquez, S. (2009). Use of nutritional supplements in sports: risks, knowledge, and behavioural-related factors. *Nutricion Hospitalaria*, 24(2), 128-134.
- Najmabadi, Sh., & Nojomi, M. (2010). Nutritional supplement use among adults in different areas of west Tehran. *Iranian Journal of Endocrinology and Metabolism*, 12(4), 365-375.
- Nobakht, M., & dezhkam, M. (2000). An epidemiological study of eating disorders in Iran. *The International Journal of Eating Disorders*, 28(3), 265-271.
- Radimer, K., Bindewald, B., Hughes, J., Ervin, B., Swanson, C., & Picciano, M. F. (2004). Dietary supplement use by US adults: data from the National Health and Nutrition Examination Survey, 1999–2000. *American Journal of Epidemiology*, 160(4), 339-349.
- Skeie, G., Braaten, T., Hjartaker, A., Lentjes, M., Amiano, P., Jakszyn, P., et al. (2009). Use of dietary supplements in the European prospective investigation into cancer and nutrition calibration study. *European Journal of Clinical Nutrition*, 63(Suppl 4), S226-S238.
- Tscholl, P., Alonso, J. M., Dolle, G., Junge, A., & Dvorak, J. (2010). The use of drugs and nutritional supplements in top-level track and field athletes. *The American Journal of Sports Medicine*, 38(1), 133-140.
- Van Thuyne, W., Van Eenoo, P., & Delbeke, F. T. (2006). Nutritional supplements: prevalence of use and contamination with doping agents. *Nutrition Research Reviews*, 19(1), 147-158.
- Wichstrom, L., & Pedersen, W. (2001). Use of anabolic-androgenic steroids in adolescence: winning, looking good or being bad? *Journal of Studies on Alcohol*, 62(1), 5-13.
- World Health Organization. (2004). Global database on body mass index: BMI classification. Retrieved 5 December 2009 from: http://apps.who.int/bmi/index.jsp?introPage=intro_3.html
- Yussman, S. M., Wilson, K., M., & Klein, J. D. (2006). Herbal products and their association with the substance use in adolescents. *The Journal of Adolescent Health*, 38(4), 395-400.

THANK YOU