Knowledge and Attitude Regarding Anabolic-Androgenic Supplementation Among Young Adults in Selected Colleges of Haryana

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Abstract
This research assesses the knowledge and attitude regarding anabolic-androgenic supplementation among young adults in specific academic settings in Haryana. Employing a quantitative, descriptive cross-sectional methodology, the researchers conducted a survey involving 120 students from nursing and pharmacy disciplines to gauge their awareness of associated risks and their views on safe usage practices. The findings indicated an average knowledge score of 14.57 (72.83%) and an average attitude score of 37.20 (74.4%), with more than half of the respondents displaying sufficient knowledge and a significant majority showing a "good" attitude towards preventing misuse. However, despite these encouraging statistics, a very weak positive correlation ($r = 0.052$) was identified between knowledge and attitude, implying that possessing medical information does not necessarily lead to safer health practices. The study concludes that although general awareness levels are adequate, there is an urgent requirement for focused educational initiatives to promote informed decision-making and enhance long-term health outcomes.

Keywords
Anabolic-Androgenic Steroids (AAS), Knowledge, Attitude, Young Adults, Performance-Enhancing Drugs, Haryana.
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Introduction

Anabolic-Androgenic Steroids (AAS) are synthetic drugs that are derived from testosterone, the main male sex hormone. The term "Anabolic" signifies the enhancement of skeletal muscle growth and tissue development, while "Androgenic" pertains to the promotion of secondary male sexual traits. Although these substances have valid medical uses for treating conditions such as male hypogonadism, osteoporosis, and aplastic anaemia, they are often misused in excessive amounts for their muscle-building and strength-enhancing effects. The primary non-medical users tend to be young adults engaged in bodybuilding, weightlifting, and competitive sports. The estimated global lifetime prevalence of AAS usage is 3.3%, with significantly higher rates among men (6.4%) compared to women (1.6%). Misuse extends beyond elite athletes and has infiltrated the general population, including an estimated half a million high school students in the United States. This misuse is frequently driven by societal pressures, social media influencers, and fitness communities that advocate for a muscular physique as an ideal of health. From a pharmacological perspective, AAS function by boosting protein synthesis and suppressing cortisol, which helps to minimise muscle degradation. However, extended use without medical oversight can result in severe health complications and even death, including sudden cardiac arrest, myocardial infarction, and liver dysfunction. Additionally, users may experience significant psychiatric problems such as aggressive behaviour, mood fluctuations, and clinical depression, which are associated with heightened risks of suicide and violent conduct.

Research Methodology

The research employed a quantitative methodology to systematically assess variables through the collection of structured numerical data. A descriptive cross-sectional design was implemented to evaluate the knowledge and attitudes of participants at a specific moment. The study took place at the College of Nursing and College of Pharmacy at SGT University in Haryana. The focus group comprised young adults aged 18 to 29 who were enrolled in these institutions, with a total of 120 participants selected via a non-probability purposive sampling method. Data was gathered using a structured questionnaire that was organised into three separate sections. Section A collected demographic details such as age, gender, and gym attendance. Section B included 20 multiple-choice questions aimed at evaluating knowledge about the definitions, applications, and risks related to AAS. Section C employed a five-point Likert scale with 10 questions to assess participants' attitudes towards safe practices and their perception of risk. The reliability of the tool was established with a score of 0.79, indicating consistent results.

Ethical considerations were paramount in the methodology; formal approval was secured from the institutional ethics committee and college

administrators. Participation was completely voluntary, and the researchers ensured the anonymity and confidentiality of all participants. Informed consent was obtained before data collection, and participants were informed of their right to withdraw at any time without facing any penalties.

Analysis and Results

The demographic analysis indicated that 77.5% of the respondents fell within the 18–20 year age range, with a notable majority being female at 65.8%. Most participants were undergraduate nursing students, comprising 84.2% of the sample, and they were primarily located in rural (46.7%) or urban (41.7%) settings. In terms of information sources, 50.8% of the participants identified the internet as their main source of knowledge regarding steroids, followed by friends at 34.2%. While 65% of the students were aware of anabolic androgenic steroids (AAS), a significant 35% had no prior knowledge of them before the study. The assessment of knowledge levels yielded a mean score of 14.57 (72.83%) out of a maximum of 20. Specifically, 55.8% of respondents exhibited adequate knowledge, 27.5% had moderate knowledge, and 16.7% displayed inadequate awareness. Regarding attitudes, the respondents achieved a mean score of 37.20 (74.4%). A substantial majority (85%) showed a "positive " attitude towards responsible supplementation practices, while only 15% exhibited a negative attitude. Statistical analysis revealed a correlation coefficient of 0.052, suggesting a very weak positive correlation between the participants' knowledge levels and their attitudes. Additionally, inferential statistics indicated significant associations between knowledge levels and demographic factors such as age, higher education, and prior awareness of AAS. In contrast, no significant associations were found between any demographic variables and the participants' attitudes, implying that demographic background does not significantly influence how these individuals perceive the risks associated with steroid misuse.

Table- 1: Distribution of respondent according to Socio Demographic Variable (N=120)

Socio Demographic Variable	F	%
1. Age (in Years)		
a) 18 - 20 years	93	77.5 %
b) 21 - 23 years	24	20.0 %
c) 24 - 26 years	2	1.7 %
d) 27 - 29 years	1	0.8 %
2. Gender		
a) Female	79	65.8 %
b) Male	41	34.2 %
3. Faculty		
a) Faculty of Nursing	101	84.2 %
b) Faculty of Pharmacy	19	15.8 %
4. Highest Education		
a) Diploma	8	6.7 %
b) Post graduate	4	3.3 %
c) Undergraduate	108	90.0 %
5. Area of Residence		
a) Rural	56	46.7 %
b) Semi-Urban	14	11.7 %
c) Urban	50	41.7 %
6. Do you attend a gym or fitness centre		
a) No	80	66.7 %
b) Yes	40	33.3 %
7. Which type of physical activity you do		
a) Bodybuilding	15	12.5 %
b) None	74	61.7 %
c) Recreational/Sports	21	17.5 %
d) Weight-lifting	10	8.3 %
8. Have you ever heard about anabolic-androgenic steroids		
a) No	42	35.0 %
b) Yes	78	65.0 %
9. Where did you obtain information about Anabolic-Androgenic steroids?		
a) Doctor	8	6.7 %
b) Friends	41	34.2 %

Socio Demographic Variable	F	%
c) Internet	61	50.8 %
d) Trainer	10	8.3 %

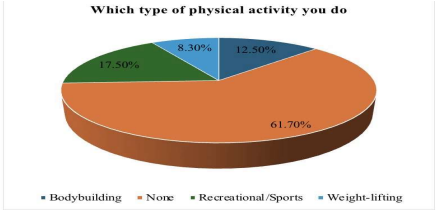


Figure 7: Pie diagram shows the distribution of respondent by Which type of physical activity you do

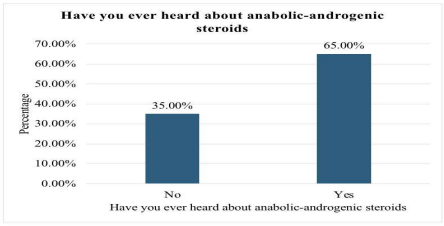


Figure 8: Bar diagram shows the distribution of respondent by Have you ever heard about anabolic-androgenic steroids

Table 2-Distribution of Respondent according to knowledge of anabolic-androgenic supplementation among young adults of selected Colleges of Haryana.

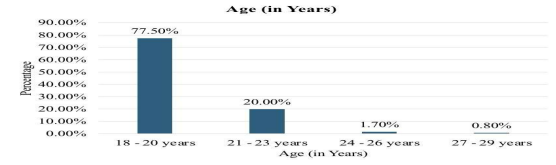


Figure 1: Pie diagram shows the distribution of respondent by age

Figure 2: Bar diagram shows the distribution of respondent by Gender

Category	Max Score	Mean	Mean %	SD
Knowledge	20	14.5667	72.83 %	4.32451

Table 3-Distribution of respondent knowledge level of anabolic-androgenic supplementation among young adults of selected Colleges of Haryana.

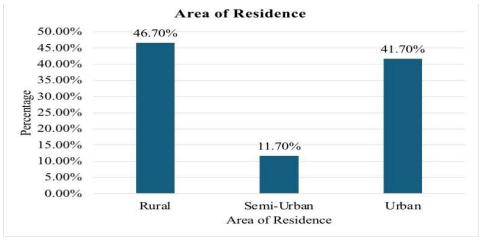


Figure 5: Bar diagram shows the distribution of respondent by Area of Residence

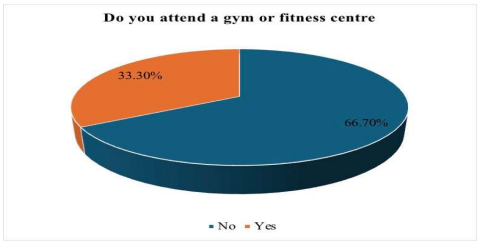
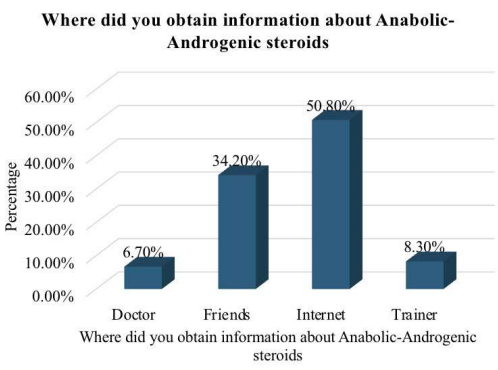


Figure 6: Bar diagram shows the distribution of respondent by Do you attend a gym or fitness centre



Sl. No	Knowledge level	Score	Frequency	Percentage
1.	Adequate	16-20	67	55.8 %
2.	Moderate	11-15	33	27.5 %
3.	inadequate	0-10	20	16.7 %
Total			120	100 %

Table 4-Distribution of Respondent according to attitude of anabolic-androgenic supplementation among young adults of selected Colleges of Haryana.

Category	Max Score	Mean	Mean %	SD
Attitude	50	37.20	74.4 %	7.04082

Table 5-Distribution of respondent attitude level of anabolic-androgenic supplementation among young adults of selected Colleges of Haryana.

Sl. No	Attitude level	Score	Frequency	Percentage
1.	Positive	31-50	102	85.0 %
2.	Negative	10-30	18	15.0 %
Total			120	100 %

Table 6: Findings related to the Correlation between knowledge and attitude regarding anabolic-androgenic supplementation among young adults

(N=120)

Young adults	R	INFERENCE
Knowledge	**0.052**	**Very weak Positive correlation**
Attitude		

Table 7- Association between knowledge level among young adults with selected demographic variable.

Variable (N = 120)	Adequate	Inadequate	Moderate	Chi-square value & df	P value	Inference
Age in year						
18 - 20 years	56	11	26	17.004 Df =6	0.009	S
21 - 23 years	11	7	6			
24 - 26 years	0	2	0			
27 - 29 years	0	0	1			
Total	67	20	33			
Gender						
Female	48	12	19	2.308 Df =2	0.315	NS
Male	19	8	14			
Total	67	20	33			
Faculty						
Faculty of Nursing	56	16	29	0.619 Df =2	0.734	NS
Faculty of Pharmacy	11	4	4			
Total	67	20	33			
Highest Education						
Diploma	2	5	1	19.054 Df =4	0.001	S
Post graduate	0	1	3			
Undergraduate	65	14	29			
Total	67	20	33			
Area of Residence						
Rural	28	11	17	1.640 Df =4	0.802	NS
Semi-Urban	8	2	4			
Urban	31	7	12			
Total	67	20	33			
Do you attend a gym or fitness centre						
No	47	11	22	1.591 Df =2	0.451	NS
Yes	20	9	11			
Total	67	20	33			
Type of physical activity you do						
Bodybuilding	10	2	3	4.727	0.579	NS
None	43	12	19			

Variable	Adequate	Inadequate	Moderate	Chi-square value & df	P value	Inference
Recreational/Sports	9	3	9	Df =6		
Weight-lifting	5	3	2			
Total	67	20	33			
Have you Ever heard about anabolic-androgenic steroids						
No	13	16	13	25.247 Df =2	0.000	S
Yes	54	4	20			
Total	67	20	33			
Where did you obtain information about Anabolic-Androgenic steroids						
Doctor	4	1	3	3.240 Df =6	0.778	NS
Friends	21	7	13			
Internet	38	10	13			
Trainer	4	2	4			
Total	67	20	33			

* NS = not significant 0.05 level of significant, S = Significant 0.05 level of significant

Table 8- Association between Attitude level among young adults with selected demographic variable.

(N=120)

Variable	Good	Poor	Chi-square value & df	P value	Inference
Age in year					
18 - 20 years	80	13	2.226 Df= 3	0.527	NS
21 - 23 years	20	4			
24 - 26 years	1	1			
27 - 29 years	1	0			
Total	102	18			
Gender					
Female	68	11	0.210 Df= 1	0.647	NS
Male	34	7			
Total	102	18			
Faculty					
Faculty of Nursing	85	16	0.354 Df= 1	0.552	NS
Faculty of Pharmacy	17	2			
Total	102	18			
Highest Education					
Diploma	6	2	1.046 Df= 2	0.593	NS
Post graduate	3	1			
Undergraduate	93	15			
Total	102	18			
Area of Residence					
Rural	49	7	1.933 Df= 2	0.380	NS
Semi-Urban	13	1			
Urban	40	10			
Total	102	18			
Do you attend a gym or fitness centre					
No	67	13	0.294 Df= 1	0.588	NS
Yes	35	5			
Total	102	18			
Type of physical activity you do					
Bodybuilding	14	1	1.404 Df= 3	0.705	NS
None	61	13			
Recreational /Sports	18	3			
Weight-lifting	9	1			
Total	102	18			
Have you ever heard about anabolic-androgenic steroids					
No	33	9	2.094 Df= 1	0.148	NS
Yes	69	9			
Total	102	18			
Where did you obtain information about Anabolic-Androgenic steroids					
Doctor	7	1	1.978 Df= 3	0.577	NS
Friends	35	6			
Internet	53	8			
Trainer	7	3			
Total	102	18			

* NS = not significant 0.05 level of significant, S = Significant 0.05 level of significant

Discussion and Conclusion

This study's findings reveal that the majority of young adults within the educational environment surveyed possess a satisfactory understanding of the risks and functions associated with anabolic-androgenic steroids. The average knowledge score of 72.83% is consistent with earlier research, including the work by Althobaiti et al. (2021), which indicated that health-related education significantly enhances student awareness. However, the

identification of a very weak positive correlation (r = 0.052) between knowledge and attitude is a noteworthy outcome. This suggests that having information does not automatically lead to a cautious or safe perspective regarding these substances. This aligns with the conclusions of Ip et al. (2011), who proposed that behavioural choices are often more swayed by social pressures, peer influence, and concerns about body image than by medical information alone. The dependence on the internet (50.8%) as the main source of information underscores a significant public health risk. As highlighted in the source material, online information frequently lacks completeness or scientific accuracy, resulting in misconceptions and unsafe practices within fitness communities. Despite 85% of students indicating a 'good' attitude towards safe practices, the persistent social and digital pressures pose a considerable risk for the minority (15%) who demonstrated a poor attitude. Notable associations between knowledge and higher education or prior awareness further stress that structured academic exposure is crucial for enhancing health literacy. In conclusion, while awareness levels are generally high among nursing and pharmacy students in Haryana, educational and demographic factors significantly influence that knowledge. The gap between individuals' understanding and their attitudes towards using these supplements indicates that education must extend beyond mere facts to tackle the psychological and social motivations driving steroid use. The findings present several implications for nursing practice and education. It is evident that nursing curricula must incorporate structured content on substance misuse and health promotion to adequately prepare future healthcare providers for community counselling roles. Nurses should proactively engage in screening and identifying risky behaviours among students and gym attendees. At the administrative and policy levels, the study supports the implementation of public awareness campaigns and preventive programs to combat the misinformation that is widespread on social media and within local fitness settings. Future research should prioritise longitudinal studies to assess the long-term effects of educational interventions on behavioural changes. Furthermore, interventional studies that evaluate the effectiveness of structured teaching programs are suggested to determine the most effective strategies for promoting responsible health practices among diverse student populations across various academic fields.

References

1. Althobiti, S. D., Alqurashi, N. M., Alotaibi, A. S., Alharthi, T. F., & Alswat, K. A. (2018). Prevalence, Attitude, Knowledge, and Practice of Anabolic Androgenic Steroid (AAS) Use Among Gym Participants. Materia socio-medica, 30(1), 49–52. https://doi.org/10.5455/msm.2018.30.49-52
2. Bhaduriya, P., Arora, S., & Saini, P. (2019). Knowledge, attitude and practices regarding anabolic steroids among adults. Nursing Midwifery Research Journal. https://doi.org/10.33698/NRF0264
3. Sura Mohammed Challab, anwer, zina mudhafar, & khalil, heba hashim. (2023). Knowledge and Attitude of Using Anabolic Androgenic Steroids Among Male Bodybuilders in Al-Russafa Baghdad Province. Ibn AL-Haitham Journal For Pure and Applied Sciences, 36(2), 22-32. https://doi.org/10.30526/36.2.3004
4. Hattab, S., Saleh, B., Qasarweh, L., Draidi, M., & Zyoud, S. H. (2024). Knowledge and attitudes toward the use of anabolic-androgenic steroids among physical education university students: a cross-sectional study from Palestine. Scientific reports, 14(1), 2146. https://doi.org/10.1038/s41598-024-52787-w .
5. Linhares, B. L., Miranda, E. P., Cintra, A. R., Reges, R., & Torres, L. O. (2022). Use, Misuse and Abuse of Testosterone and Other Androgens. Sexual medicine reviews, 10(4), 583–595. https://doi.org/10.1016/j.sxmr.2021.10.002
6. Ganson, K. T., Hallward, L., Cunningham, M. L., Murray, S. B., & Nagata, J. M. (2023). Anabolic-Androgenic Steroid Use: Patterns of Use among a National Sample of Canadian Adolescents and Young Adults. Performance enhancement & health, 11(1), 100241. https://doi.org/10.1016/j.peh.2022.100241
7. Sagoe, D., Molde, H., Andreassen, C. S., Torsheim, T., & Pallesen, S. (2014). The global epidemiology of anabolic-androgenic steroid use: A meta-analysis and meta-regression analysis. Annals of Epidemiology, 24(5), 383–398. https://doi.org/10.1016/j.annepidem.2014.01.009
8. de Ronde, W., & Smit, D. L. (2020). Anabolic androgenic steroid abuse in young males. Endocrine connections, 9(4), R102–R111. https://doi.org/10.1530/EC-19-0557
9. Kishner, S. (2024, December 5). Anabolic steroid use and abuse: Practice essentials, biopharmacology of testosterone, biochemistry and pharmacology. Medscape. https://emedicine.medscape.com/article/128655-overview

10. Davis, K. (2016, February 23). Anabolic steroids: What you should know. Medical News Today. https://www.medicalnewstoday.com/articles/246373
11. Kicman, A. T., Cowan, D. A., & Walker, C. J. (2022). Anabolic androgenic steroids: What the endocrinologist needs to know. Frontiers in Endocrinology, 13, 1059473. https://doi.org/10.3389/fendo.2022.1059473
12. Wikipedia. (n.d.). Anabolic steroid. In Wikipedia. Retrieved June 13, 2026, from https://en.wikipedia.org/wiki/Anabolic_steroid
13. National Health Service. (2025). Anabolic steroid misuse. NHS. https://www.nhs.uk/conditions/anabolic-steroid-misuse/
14. Byatt, D., Bussey, K., Croft, T., Trompeter, N., & Mitchison, D. (2025). Prevalence and Correlates of Anabolic-Androgenic Steroid Use in Australian Adolescents. Nutrients, 17(6), 980. https://doi.org/10.3390/nu17060980
15. Saleh, Medhat Araby Khalil, Jawad Bashir, and Doaa M. El Shehaby. 2025. "A Systematic Review of the Use of Androgenic Anabolic Steroids (AAS) and Their Possible Side Effects in the Arab Countries". Journal of Advances in Medicine and Medical Research 37 (8):29-48. https://doi.org/10.9734/jammr/2025/v37i85904.
16. Windfeld-Mathiasen, J., Heerfordt, I. M., Dalhoff, K., Andersen, J. T., Andersen, M. A., Johansson, K. S., Biering-Sørensen, T., Olsen, F. O., & Horwitz, H. (2025). Cardiovascular disease in anabolic androgenic steroid users. Circulation, 151(12), 828–834. https://doi.org/10.1161/CIRCULATIONAHA.124.071117