

Performance-Enhancing Dietary Supplement Use Among Men and Women in American Gyms

Harrison G. Pope, Jr., M.D.

Gen Kanayama, M.D., Ph.D.

Amanda J. Gruber, M.D.

McLean Hospital, Belmont, MA and
Harvard Medical School, Boston, MA.

Study #1

Over-The-Counter Drug Use In Gymnasiums: An Underrecognized Substance Abuse Problem?

G. Kanayama, A. J. Gruber, H. G. Pope, Jr,
J. J. Borowiecki, J. I. Hudson
(Psychotherapy and Psychosomatics 2001;70:137-40)

Study #1:

- We distributed anonymous questionnaires to 511 clients entering five gymnasiums, asking about use of both supplements and anabolic steroids.
- The questionnaire asked “How much time have you used each of these supplements in **the last three years?**”
- Respondents were given a choice of: **Never**; **A Little** (0-1 month); **Moderate** (1-6 months); or **A Lot** (6+ months).
- The questionnaire provided brand names of common supplements so that subjects could identify them. For example:

“**Ephedrine-containing products:** Cuts III, Diet Fuel, Dymetadrine, Dynaburn, Hydroxycut, Metabolife, Ripped Fuel, Stacker products, Thermoblast, Thermocuts, Thermachrome, Thermadrine, Xenadrine.”

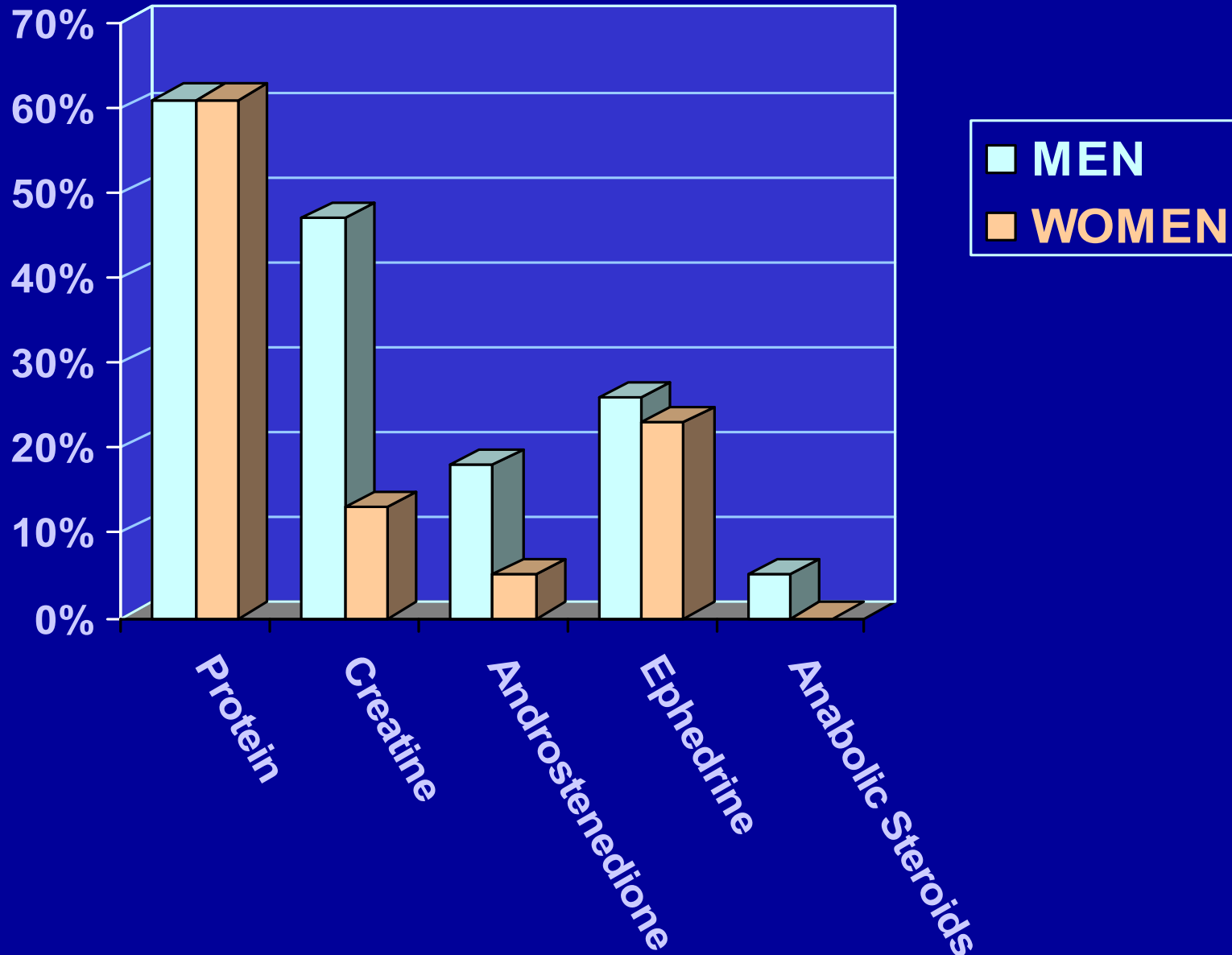
Supplement and Drug Use During the Last Three Years: MEN (N=334)

	Any Use, N (Percent)	Use > 6 Months, N (Percent)
Food supplements		
Protein	205 (61)	90 (27)
Creatine	156 (47)	38 (11)
Drugs		
Androstenedione	60 (18)	14 (4)
Ephedrine	86 (26)	29 (9)
Anabolic Steroids	18 (5)	8 (2)

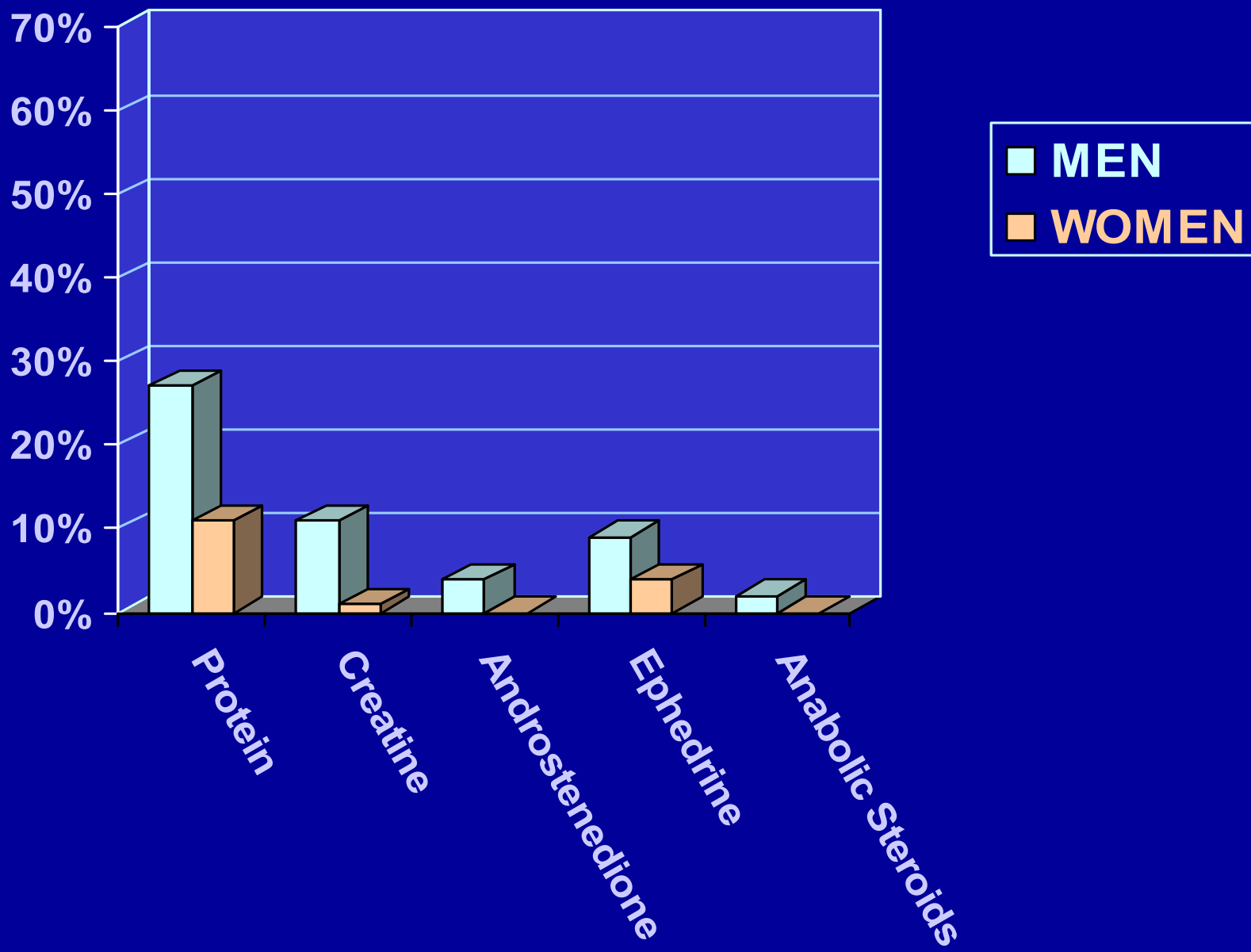
Supplement and Drug Use During the Last Three Years: WOMEN (N=177)

	Any Use, N (Percent)	Use > 6 Months, N (Percent)
Food supplements		
Protein	61 (34)	19 (11)
Creatine	13 (7)	1 (1)
Drugs		
Androstenedione	5 (3)	0
Ephedrine	23 (13)	7 (4)
Anabolic Steroids	0	0

Any Use in Last Three Years



Use > 6 Months in Last Three Years



Rough Estimates of Rates of Supplement and Anabolic Steroid Use Among Gymnasium Clients Nationally

	Men	Women
Food supplements		
Protein	4.3 Million	2.7 Million
Creatine	3.3 Million	560,000
Drugs		
Androstenedione	1.3 Million	240,000
Ephedrine	1.8 Million	1.0 million
Anabolic Steroids	400,000	

Study #2

Psychiatric And Medical Effects Of Anabolic-Androgenic Steroid Use In Women

A. J. Gruber, H. G. Pope, Jr

(Psychotherapy and Psychosomatics 2000;69:19-26)

- We recruited advanced women athletes by advertisements in gymnasiums, stating:

Have you competed at least once in a bodybuilding or fitness contest?

or

Have you lifted weights in the gym at least 5 days per week for at least 2 years?

- Qualifying subjects were offered \$75 to come to our laboratory for a one- to two-hour psychological and medical evaluation

Supplement Use in Anabolic Steroid Users vs. Non-users Among 75 Advanced Women Weightlifters

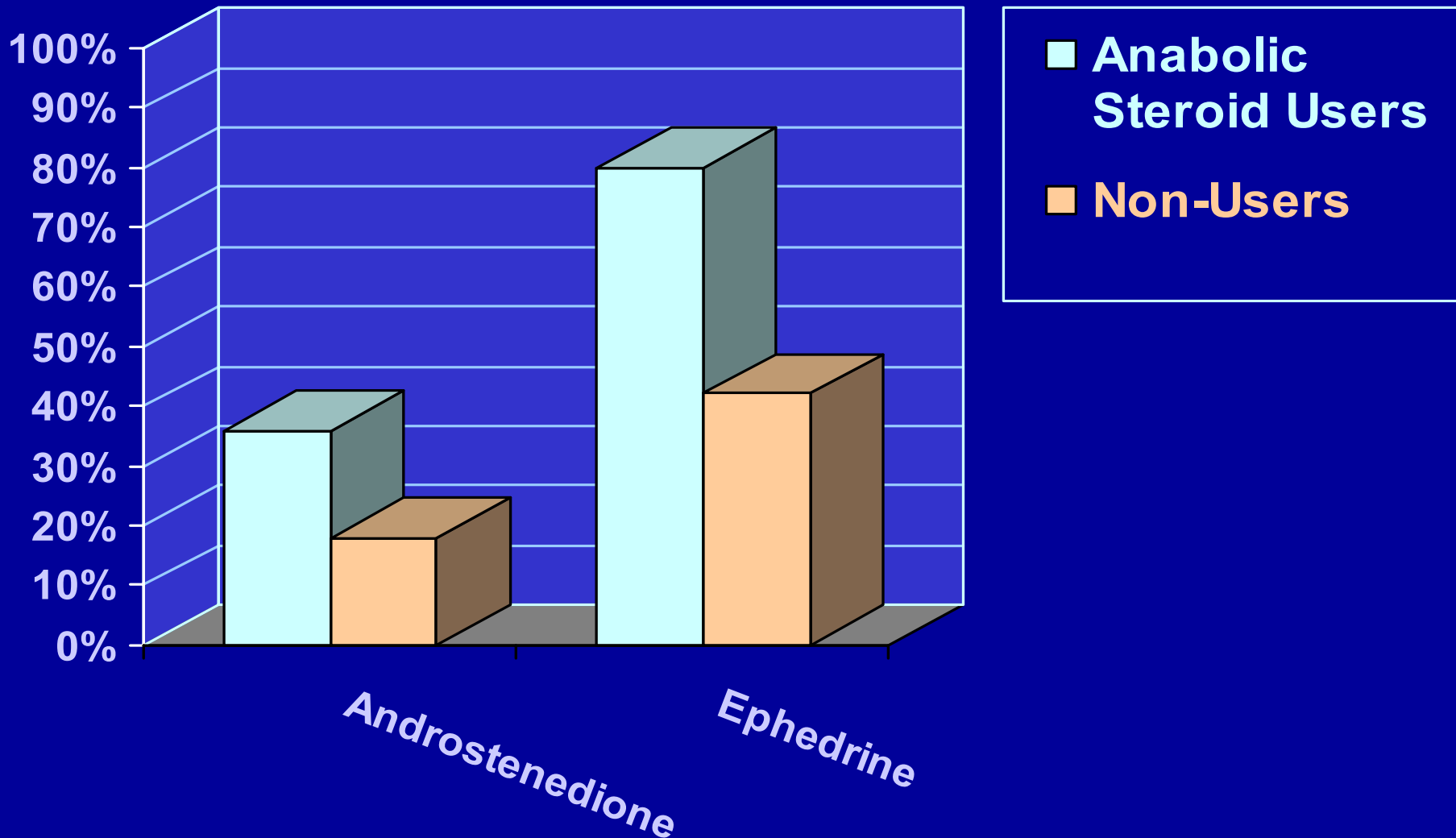
	Anabolic Steroid Users N = 25	Non-Users N = 50
Androstenedione, N (%)	9 (36)	9 (18)
Ephedrine, N (%)	20 (80)	21 (42)

Differences between steroid users and non-users by Fisher's exact test, two-tailed: androstenedione use, $p = 0.10$; ephedrine use, $p = 0.003$.

Lifetime Use of Other Substances Among 75 Advanced Women Weightlifters

	Anabolic Steroid Users N = 25		Non-Users N=50	
	N	%	N	%
Aminoglutethimide	1	4	0	
Amphetamines	3	12	4	8
Caffeine dependence	19	76	22	44
Clenbuterol	18	72	5	10
Diuretics	20	80	9	18
GHB	5	20	1	2
HCG	1	4	0	
Human Growth Hormone	1	4	0	
Laxatives	7	28	5	10
Nalbuphine	4	16	0	
Tamoxifen	6	24	1	2
Thyroid hormones	8	32	2	4
Yohimbine	2	4	4	8

Supplement Use Among 75 Advanced Women Weightlifters



Study #3:

Substance Use Among Advanced Male Weightlifters

G. Kanayama, H. G. Pope, Jr.
(Data in preparation)

- We recruited advanced male weightlifters by advertisements in gymnasiums and nutrition stores, stating:

Can you bench press 275 pounds for at least one repetition?

- Qualifying subjects were offered \$100 for a 60- to 90-minute psychological and medical evaluation.

Lifetime Creatine Use Among 87 Advanced Male Weightlifters

	N	(%)
Any use	75	(88)
At least 12 months	34	(40)
At least 36 months	9	(11)

Lifetime Androstenedione Use Among 87 Advanced Male Weightlifters

	N	(%)
Any use	49	(56)
At least 6 months	24	(28)
At least 12 months	11	(13)

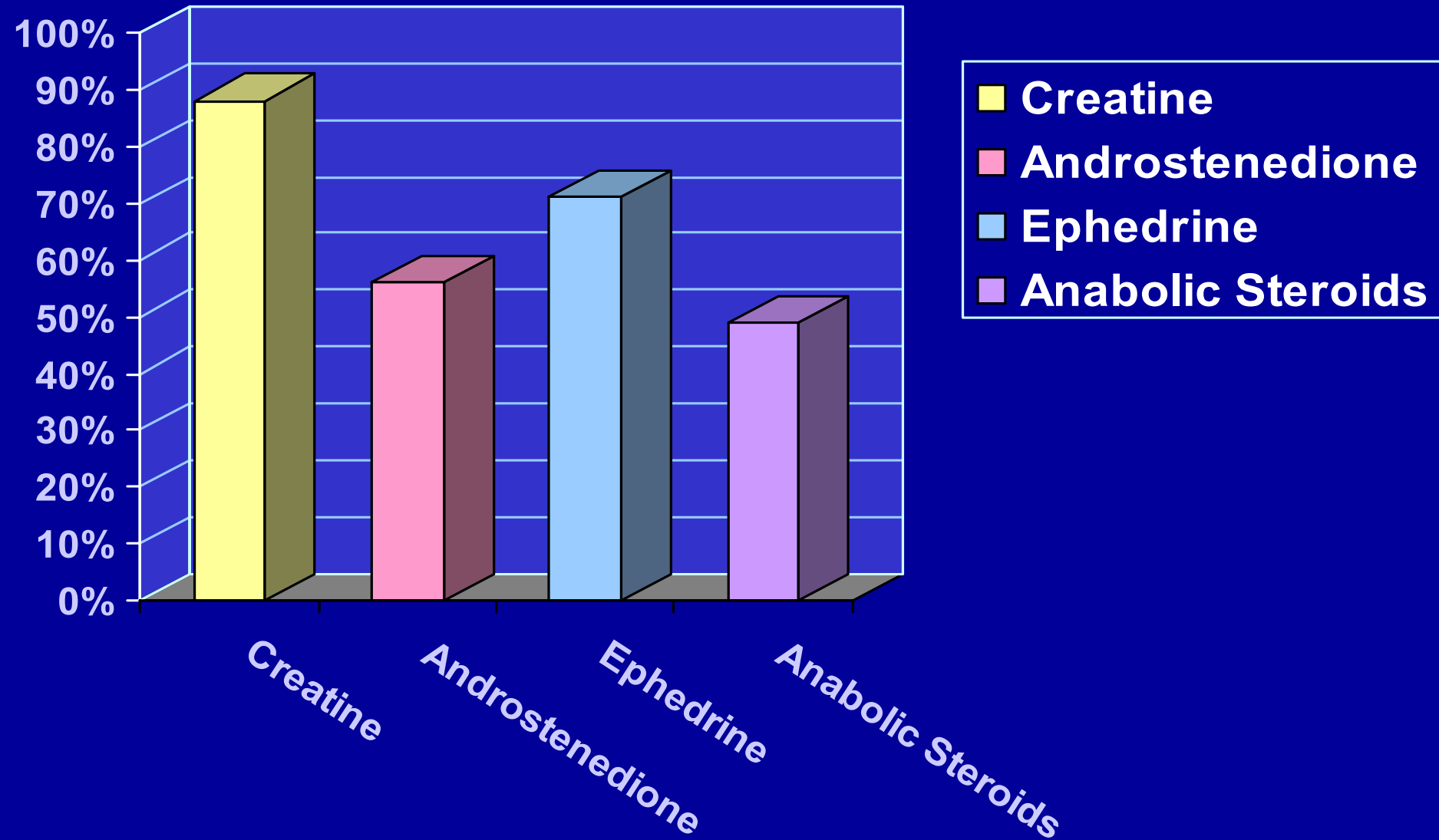
Lifetime Ephedrine Use Among 87 Advanced Male Weightlifters

	N	(%)
Any use	62	(71)
At least 12 months	37	(43)
At least 36 months	15	(17)

Lifetime Anabolic Steroid Use Among 87 Advanced Male Weightlifters

	N	(%)
Any use	43	(49)
At least 6 months	20	(23)
At least 24 months	8	(9)

Supplement Use Among 87 Advanced Male Weightlifters



Supplement Use in Anabolic Steroid Users vs. Non-Users Among 87 Advanced Male Weightlifters

	Anabolic Steroid Users N = 43	Non-Users N = 44
Creatine, N (%)	39 (91)	37 (84)
Androstenedione, N (%)	30 (70)	18 (41)
Ephedrine, N (%)	33 (77)	29 (66)

Differences between steroid users and non-users by Fisher's exact test, two-tailed: creatine use, $p = 0.52$; androstenedione use, $p = 0.01$; ephedrine use, $p = 0.034$.

Supplement Use Among 87 Advanced Male Weightlifters

