

Effects of Fear Appeals on Communicating Potential Health Risks of Unregulated Dietary Supplements to College Students

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Background: Fear appeals are commonly used in health communication to reduce risk. It is not clear, however, whether familiarity with a health topic can lessen the threat intended. The use of unregulated dietary supplements among young adults is one such area that needs study. **Purpose:** The study examined the effect of fear appeals on self-protective behavior when college students were informed of the risks of consuming the dietary supplement creatine. It focused on students' responses to fear appeals that varied depending on their familiarity with the product. **Methods:** Students were assigned to one of 3 groups based on familiarity with creatine. A total of 121 college students viewed advertisements depicting creatine consumption side effects, followed by the main questionnaire including perceived risk, attitudes, and behavioral intention measures. **Results:** Fear appeal messages were most effective for those least familiar with creatine. **Discussion:** Familiarity based on previous experience is a factor that must be considered when presenting threatening health information. **Translation to Health Education Practice:** Health educators and practitioners should inform young adults about risks and proper consumption of dietary supplements before they develop a strong disposition toward the product without accurate knowledge of proper dose and potential side effects.

BACKGROUND

Health education literature suggests that awareness of a behavior's risks plays a key role in the effectiveness of persuasive messages in health campaigns. Increasing public attention to such risks is a typical strategy used in a variety of health communication domains.¹⁻³ In addition, previous literature explained how fear appeals could be used effectively in persuading people and shows that fear appeal messages are the most common way of persuading people when using negatively framed messages in health behavior change campaigns.^{2,4,5} However, when it comes to changing attitudes and health behaviors, threatening someone is replete with limitations. As previous literature pointed out, fear appeals may produce boomerang effects, leading the audience to immediately avoid the intended message due to an extreme level of fear, regardless of potential health benefits.^{6,7} Interestingly, boomerang effects are more likely to occur in people who have engaged in unhealthy behaviors than those who have not.^{2,8,9}

Since the passage of the Dietary Supplement Health Education Act (DSHEA), which classifies dietary supplements as foods rather than drugs,¹⁰ consumers have been overwhelmed with an enormous number of dietary supplements, some of which directly affect body function and metabolism.^{11,12} A typical marketing strategy for such products is to promote their effectiveness by using phrases such as "scientific breakthrough"¹² while minimizing information about side effects.^{12,13} Young adults are one of the largest target audience groups because of their high level of interest in performance-enhancing dietary supplements.^{11,14,15} The DSHEA has allowed the dietary supplement market to entice this vulnerable population and make it easy for them to engage in unregulated consumption by circumventing legal guidelines set forth by the Food and Drug Administration.^{10,12}

Creatine is a naturally produced amino acid found mainly in muscles. The role of creatine is to regenerate adenosine triphosphate by breaking it down when an individual needs energy during high-intensity, short-duration exercise such as lifting weights or sprinting.^{16,17} Because of its effects on muscles of the human body, creatine is one of the most popular performance-enhancing supplements among college students.¹⁸ In the United States alone, a 2009 report estimated that roughly \$2.7 billion dollars was spent on creatine each year,¹⁹ and creatine-based dietary supplements are still one of the top sellers in the marketplace.²⁰ Judging by creatine's popularity,^{18,19,21} the typical marketing strategy is to attract young consumers by touting the effectiveness of creatine in building muscle and shaping an attractive body.¹²

The safety as well as effectiveness of using creatine for athletic performance has not been fully proven, especially with regard to its long-term effects.^{17,19,21-23} Several athletic associations, including the National Collegiate Athletic Association, restrict the excessive use of creatine, citing concerns that overdose of pure creatine supplements may cause serious side effects such as kidney damage and hormone alteration, especially among young athletes.^{22,24-26} In addition, evidence of these side effects is inconclusive because the dietary supplement market constantly introduces many newer forms of creatine supplements,^{19,27,28} though numerous anecdotal accounts illustrate adverse side effects, such as kidney dysfunction, effects on the body's creatine and insulin production, diarrhea, and other gastrointestinal problems.¹⁸

Because of widespread use among young adults, along with the supplement industry's aggressive marketing of dietary supplements, including creatine,¹³ creatine seemed to be the appropriate supplement to test whether or not a fear-based health advertising campaign could persuade people, especially young adults, to be cautious when using this product and to test whether or not actual experience with the supplement would moderate the effect of a high threat message.

Fear Appeal Message Campaigns

Health information campaigns have used fear appeal techniques to inform about risks. Witte⁶ defined fear as "negatively-valenced emotion, accompanied by a high level of arousal, and is elicited by threat that is perceived to be significant and personally relevant."^(p331) Fear can be instilled by health campaign messages that contain "gruesome content" supported by graphic language, technical explanations, "personalistic language" (e.g., "smokers like you ..."), or "gory pictures" (e.g., visual images of damaged lung of heavy smokers).⁶ A fear appeal is a way to express negatively framed messages and a theory of behavior modification that uses a persuasive message threatening an adverse consequence.²⁹

Popular Health Behavior Change Models

Numerous models exist that demonstrate the impact of fear-arousing messages on attitude and behavior changes. These models focus on fear factors that affect attitudes, intentions, and behaviors.³⁰⁻³² Most fear appeal models imply a physical threat. Those concerned with preventive health behavior often believe that higher perceptions of risk result in adaptive responses toward health threats. But this is not always the case. Several health behavior models suggest that emotions and coping mechanisms also come into play.⁶

Rosenstock's seminal work on the Health Belief Model (HBM) suggests that individuals direct their behavior to avoid risks based on their perceptions of (a) various conditions for a health issue and (b) benefits gained by taking the recommended action or the cost paid for absence of the action.³³ When the threat level of a health concern is high based on the perceived susceptibility (i.e., how likely they are to be exposed to health risks) and perceived severity (i.e., how dangerous the health issue is), people are likely to act to prevent occurrence of such risks. The final decision to act comes after weighing benefits and costs of the action. Then, confidence in their ability to perform the action (i.e., self-efficacy) eventually leads them to initiate a healthy behavior.³³⁻³⁵

In line with the effects of threats and efficacy on one's behavior change, the Extended Parallel Process Model (EPPM) explains how persuasive messages work (or fail) in any situation.⁶ This model describes "a parallel

approach to explain how individuals process and respond to threatening messages.”²⁹ (p28) The EPPM refers to “both the emotional and cognitive factors associated with message processing and relates these processes to fear appeals’ success or failure.”²⁹ (p28) According to the EPPM, fear appeal messages direct cognitive evaluations in 2 ways: judgment of threats and solution for the threats. After cognitive evaluations, 2 different responses result in one of 3 outcomes: no response, acceptance, or rejection of the message.²⁹ If the level of fear outweighs the ability to solve the problem, individuals tend to ignore or avoid message warnings.^{6,29,36} This is consistent with a conclusion of another study about fear appeal messages. Keller and Block³⁷ indicated that when the extent of fear is too high, “one may engage in defensive denial of the message by denying either the existence of a problem or its importance.”⁴⁸ Witte’s EPPM explains that excessive feelings of fear in combination with low self-efficacy (the belief that one can do little or nothing to alter a threat) results in the rejection of health messages and are associated with risky behaviors.³⁶

Rogers’ Protection Motivation Theory (PMT) also attempts to explain the process of behavioral change in terms of threat and coping appraisal.^{30,38} The theory posits that people’s intentions to protect themselves are weakened by the perceived costs of the advocated risk-reducing behavior and the perceived benefits of the opposing risk-enhancing behavior.

According to PMT, environmental and personal factors combine to pose a potential health threat.³⁸ The threat message initiates 2 cognitive processes: threat appraisal and coping appraisal. The threat appraisal process evaluates the factors associated with the behavior that potentially creates danger, including the intrinsic and extrinsic rewards accompanying the behavior, the severity of the danger, and one’s vulnerability to it. The coping-appraisal process evaluates one’s ability to cope with and avert the threatened danger (*self-efficacy* and *response efficacy*), balanced with the costs associated with protective behavior (*response cost*). These 2 appraisal pathways combine to form *protective motivation*. Thus, the adoption of a health behavior is a temporal process from motivation, to decision, then to action. The threat to health is posited to be the stimulus to contemplate protection motivation, followed by the decision to take action or the intention to act. This intention then leads one to carry out the decision, to encounter difficulties, and to either succeed or fail.³⁸

Prior research has provided considerable support for the role of the major PMT constructs in predicting one’s behavioral intention in a variety of behavioral contexts.³⁹ Sample topics include smoking cessation,^{31,40,41} condom use and HIV prevention,^{32,42,43} cancer prevention,^{44,45} and drinking and driving.^{46,47} Most of these studies have manipulated one or more of the PMT constructs to assess short-term impact on behavioral intention.

In general, the factors underlying the threat appraisal and coping appraisal processes have been studied separately, though occasionally threat or coping appraisal has been studied as a whole.⁴³ According to the PMT, people can be motivated to engage in desirable health behaviors not only to avoid health risks but also to avoid social or interpersonal risk.³⁸ In fact, it appears that many researchers argue that risk perception does not adequately explain people’s intentions to avoid risks and that fear should be added as an affective mediator.^{6,43} In the case of creatine, individuals might be motivated by peer pressure, body image, or athletic performance goals.

The literature clearly indicates that fear campaigns can be effective when they provide a way to avoid the consequences.⁶ However, the literature also suggests that fear appeals may trigger maladaptive coping mechanisms in individuals with personal knowledge of the product or with those who use or have used it⁶; for example, smokers who are fully aware of the dangers but continue to smoke or, as in the case of cigar smokers, who actually organize occasions to celebrate their use of the product. There are also questions concerning the effectiveness of fear campaigns when scientific evidence is unclear for either the benefits or the harm related to a product, as is the case with many dietary supplements, including creatine. The limitations for the fear appeal are of concern to advertisers, who may wish to create such a campaign, and to public relations people who may find their company the target of such a campaign.

PURPOSE

This study will address a possible limitation of fear appeals; specifically, can they influence attitudes toward a product for which no clear scientific evidence of harm exists? We will try to answer the questions: Are fear appeal messages effective in a health campaign aimed at persuading college students to change attitudes toward consuming creatine? How is the effectiveness of the message tempered by actual use of the product or familiarity with it? Are fear appeals effective when only anecdotal evidence exists, and what are the limiting factors of familiarity with the product on such a campaign? Based on the literature, we formulated the following 3 hypotheses.

- H1: Those with no familiarity with creatine will report higher perceived risk after viewing fear-inducing advertisements than those with prior experience with the product.
- H2: Fear appeal advertisements will produce a stronger negative attitude toward creatine in students with no familiarity with the product.
- H3: After exposure to the fear appeal advertising, those with no familiarity with creatine will express stronger intentions to avoid creatine in the future than those who are somewhat familiar with creatine and those who actually use it.

METHODS

One hundred and twenty-one participants were drawn from a convenience sample of mass communication classes at Kansas State University. The Institutional Review Board of the university approved the study. They were told they would be evaluating potential advertisements for a campaign involving dietary supplements. The average age of this group was 20.6, with freshmen making up 37.2% of the group, sophomores making up 24.8%, juniors at 14.9%, seniors at 14%, and graduate students making up the remaining 5.8% of the participants. Seventy-eight of the participants were female and 42 were male (with one participant not indicating sex).

Of this group, 17 had used creatine and one was still using it, referred to as group MF, which means *more familiar*. Of the 121 participants, 22 had never heard of creatine. This group is designated NF, which means *nonfamiliar*. Eighty-one participants knew of creatine but had never used it and are referred to as SF, which means *somewhat familiar*.

There were significant differences in terms of men and women with regard to familiarity with creatine. There were about 3 women to each man in the NF group, and only 2 women had actually used creatine. There was no difference among the 3 groups in terms of satisfaction with physical appearance, exercise habits, overall health consciousness, or intensity of workouts. Participants spent on average 5.8 hours per week exercising. This consisted of full-body training including such activities as cardiovascular exercise, weight training, and aerobics. Once participants completed the whole experiment session including posttest questionnaire, they were debriefed that the content of the advertisement was not scientifically verified.

Fear Appeal Stimulus

Three advertisements were created ostensibly for comparison. Each advertisement in the campaign had the headline "Big dreams? There are no shortcuts." There was a graphic image involving a subject in the age range of the participants. In one the image depicted an emaciated methamphetamine user. In the second, the body was distorted with a chain replacing the backbone. The third advertisement was of an athletic male with his face in the shadows. The copy read:

You should not take more than the 20-gram dose for more than four to five days at a time. Overdose can result in dangerous side effects including dehydration, which may lead to impaired thermoregulation and subsequent heat exhaustion. Other reported side effects include breast formation in men (gynecomastia), hair loss (men), hair growth (women) and stunted growth in children. Unexplained

incidences of aggression and acne have also been linked to creatine use.

There was no information suggesting a recommended response. Coping mechanisms were presumed to be irrelevant in this context because refraining from creatine use is 100% effective for avoiding the risks incurred. Literature suggests that creatine users are more likely to ignore this high-threat, no-efficacy message.^{2,8,9}

It should be pointed out that the images and text were not related and there was no evidence offered to support the wild claims in the text. In truth, claims were made up and in no way should be considered to represent real concerns about creatine.

Procedure and Measures

After signing informed consent forms and receiving instructions about the procedure, participants were first asked to fill out a survey to report their familiarity with creatine in particular. The participants were then shown the 3 ads, projected for 30 seconds each, on a screen. Following the exposure, participants were given a questionnaire that included cover questions concerning how they would rate the ads, how effective they were, and so on, followed by the real questions measured attitude about dietary supplements in general ($\alpha = .74$) and creatine specifically ($\alpha = .82$) using a 7-point scale with the paired words good/bad, undesirable/desirable (reverse-coded item), favorable/unfavorable, and harmless/harmful. Perceived risk was measured by asking the participant how much he or she agreed or disagreed with the following statements as measured on a 7-point Likert scale: “It is likely I will develop physical abnormalities if I keep using creatine.” “After seeing the ads, I’m more aware of the consequences of creatine use.” “The side effects mentioned in the ads frighten me.” “All students should stop using creatine” ($\alpha = .83$).

Intention to use creatine was measured on the same Likert scale with the questions: “I intend to start/continue using creatine” (a reverse-coded item). “If I’m taking creatine, I’ll stop.” “I intend to talk to my friends about the risks of taking creatine” ($\alpha = .64$).

RESULTS

Because the study was biased to unequal sample sizes for the level of familiarity with creatine among groups, it employed unweighted mean analysis (type III sum of squares used) to a series of one-way analyses of variance (ANOVAs). In addition, for the pairwise comparison if any significant difference was found among groups, Tukey-Kramer pairwise test was used.⁴⁸ No significant outliers were found with regard to dependent variables. To alleviate the issue of homogeneity of variance for the dependent variables, a series of univariate analyses used a 99% confidence level to reduce type I error. Correlations among dependent variables showed no serious cause for the violation of multicollinearity (all Pearson’s r s were less than 0.70).⁴⁹

H1: Those with no familiarity with creatine will report higher perceived risk after viewing fear-inducing advertisements than those with prior experience with the product.

One-way ANOVA showed significant differences between the groups in the direction predicted, which supports hypothesis 1, $F(2, 118) = 7.95, P < 0.01$, partial $\eta^2 = 0.12$. Those who had actually used the product reported the lowest perceived risk (MF: $n = 17, M = 4.56, SD = 1.59$), whereas those who knew about but never used creatine reported higher perceived risk (SF: $n = 82, M = 5.53, SD = 1.24$). Participants with no familiarity with creatine reported the highest perceived risk (NF: $n = 22, M = 6.11, SD = 0.64$). Specifically, the mean difference between the NF and MF group was the most significantly different (see Table 1).

TABLE 1
Analysis of Variances for Dependent Variables^a

<i>Dependent Variables</i>	<i>Group</i>	<i>Perceived Risks</i>	<i>Attitude^b Toward Creatine</i>	<i>Intention to Avoid Creatine^c</i>
Mean	NF (<i>n</i> = 22)	6.11 (0.64) ^a	6.00 (1.42) ^a	5.74 (0.70) ^a
	SF (<i>n</i> = 82)	5.53 (1.24) ^{ab}	5.85 (1.02) ^a	5.34 (1.13) ^a
	MF (<i>n</i> = 17)	4.56 (1.59) ^b	4.68 (1.40) ^b	4.36 (1.76) ^b
F (2, 118)		7.95*	8.12**	6.99*
Partial η^2		0.12	0.12	0.11

The mean difference is significant at the .05 level. * $P < .01$. ** $P < .001$. Means with no subscript in common differ at $P < .01$ using Tukey-Kramer post hoc comparisons.

^a NF indicates nonfamiliar group; SF, familiar but never used group; MF, familiar and actually used group. Means are unweighted ($N = 121$). Standard deviations are shown in parentheses.

^b Lower scores indicate a more positive attitude toward creatine.

^c Lower scores indicate less willingness to avoid consuming creatine.

H2: Fear appeal advertisements will produce a stronger negative attitude toward creatine in students with no familiarity with the product.

The second hypothesis was partially supported. One-way ANOVA showed that the group that was somewhat familiar but had never used the product (SF: latter attitude toward creatine: $n = 82$, $M = 5.85$, $SD = 1.02$) and nonfamiliar group (NF: latter attitude toward creatine: $n = 22$, $M = 6.00$, $SD = 1.42$) indicated a more negative attitude toward creatine than creatine users (MF: $n = 17$, $M = 4.68$, $SD = 1.40$), $F(2, 118) = 8.12$, $P < 0.001$, partial $\eta^2 = 0.12$. Of the specific pairwise comparisons among groups, the means of both SF and NF group were significantly different from that of MF group (Table 1). Therefore, the evidence suggests that those who had some familiarity but had not used as well as those who had never heard of creatine possessed a more negative attitude toward creatine than those who had actually used the product (see Table 1).

H3: After exposure to the fear appeal advertising, those with no familiarity with creatine will express stronger intentions to avoid creatine in the future than those who are somewhat familiar with creatine and those who actually use it.

Hypothesis 3 was partially supported by the results. Those with no familiarity with creatine reported the strongest intention to avoid creatine use ($n = 22$, $M = 5.74$, $SD = 0.70$), followed by those who had known about creatine but actually not used it ($n = 82$, $M = 5.34$, $SD = 1.13$). The most familiar group, with actual experience, reported the lowest intention to stop using creatine ($n = 17$, $M = 4.36$, $SD = 1.76$), $F(2, 118) = 6.99$, $P < 0.01$, partial $\eta^2 = 0.11$ (see Table 1).

DISCUSSION

Our main finding was that fear appeal messages seem to be effective when participants have limited previous experience with the product. We also found that students with no previous familiarity with the product reported the highest perceived risks among the 3 groups and expressed more negative attitudes toward creatine consumption than those who had actually used creatine. Because they had no information about creatine before viewing the ads, this response among nonfamiliar individuals was clearly prompted by the fear appeal itself. Participants with some

familiarity but no actual experience also showed greater perceived risk toward using creatine than those who had actually consumed creatine, although their levels of perceived risk did not statistically differ. In addition, the result of intention to avoid creatine showed effectiveness of fear appeal messages for both nonfamiliar and somewhat familiar groups (see [Table 1](#)).

Because negative attitude toward consumption was higher among those in nonfamiliar and somewhat familiar groups, we might assume that these individuals had been paying more attention to controversy about the safety and efficacy of the dietary supplement as reported in the media. In addition, they may have heard inconclusive evidence about harmful side effects through media or interpersonal communication. Our results suggest that these sources of information, combined with exposure to the fear appeal ads, resulted in higher perceived risk and more negative attitudes toward creatine consumption.

On the other hand, creatine users reported the least perceived risk, the least negative attitudes toward consumption and least intention to stop using creatine of our 3 groups. Both HBM and PMT suggest that individuals who perceive high risk but are not given suggestions on as well as confidence with how to deal with the threat may adopt maladaptive behaviors such as passive avoidance or denial.^{6,37,38} The finding of the current study seems to support this idea. Perceived benefits (intrinsic/extrinsic rewards) is another concept in the HBM and PMT^{33,34,38} that may explain why users perceive creatine consumption as less risky. They may derive perceived benefits from using the product, thus reducing overall threat appraisal and leading to lower protective motivation. Likewise, with regard to behavioral intentions, results show that those who are most familiar show the strongest intention to consume creatine even after exposure to fear appeal messages. On the other hand, those with no previous experience reported highest intention to avoid consumption in the future.

In fact, some studies examined the effectiveness of fear appeal messages depending on involvement with the topic. The literature suggests that issue involvement based on prior experiences (e.g., smoking) could moderate the relationship between fear appeals in messages and persuasion outcomes.⁹ The current study specifically operationalized the familiarity with the issue in the context of the actual consumption of the target dietary supplement. In particular, the current study examined the effect of the level of familiarity with a product in which side effects or hazards might not be well known to the public regardless of the level of experience, unlike smoking. Therefore, it clearly showed the importance of issue familiarity largely based on prior experience in determining fear appeal effectiveness on specific target audiences, as well as providing theoretical support to fear appeals models such as PMT.

However, it is unclear whether prior experience or knowledge would yield different responses depending on varying levels of fear appeals in messages. Future studies may want to examine attitudes toward the ads to rule out properties of the ads themselves that may affect message processing although the study tried to control this effect by exposing all of the participants to identical stimuli. However, repetition might have reinforced negative responses because we showed participants the same verbal fear appeal message in all 3 ads.⁵⁰ Future research should control this effect by varying levels of fear and information. The effect of source credibility⁵¹ should also be considered.

Some limitations should be further addressed. Though the present study shows fear appeals to be effective in the short term, the literature is relatively pessimistic about their long-term effectiveness.⁵² The present study could be enhanced by adding a follow-up survey to determine how much of the ad content participants can recall and to determine whether attitude change and behavioral intention stand the test of time. As briefly indicated in the Methods section, our study is prone to the issue of the small sample size, especially for the nonfamiliar and most familiar groups. Therefore, we do not have much information about those 2 groups. Due to the nature of the experimental setting, our results are not generalizable to creatine users as a whole. Results may vary depending on the demographics of the experimental group when it is replicated. In addition, the pre- and posttest design of the

experiment might be vulnerable to measurement sensitization, which might tend to inflate the negative attitude toward creatine for all of the study groups.⁵⁰

Finally, we did not look at gender as a variable because so few women in our study reported using creatine. However, in health campaigns focused on other dietary supplements, fear appeal messages may result in different outcomes for males and females because significant differences in preferences for certain dietary supplements may produce different levels of familiarity and relevant knowledge. More research is needed on the types of fear appeals that work best with each of these groups to help devise appropriate campaigns for each gender.

TRANSLATION TO HEALTH EDUCATION PRACTICE

Recent studies have addressed the importance of health education to prevent young adults from relying heavily on various dietary supplements.¹¹ Intake of such supplements according to label directions may not pose serious risks.⁵³ However, a strong desire to add muscle in a short time may lead vulnerable individuals to take a product or even multiple products, exceeding the suggested dose. Thus, as the current study clearly suggests, health education efforts should be aimed at young adults and adolescents to urge them to refrain from consuming unverified dietary supplements in the first place.

Early education is essential because peer influence governs behaviors of this age group in a form of peer norms.⁵⁴ Young adults and adolescents may be easily convinced by their peers' beliefs and behaviors. To belong to the peer group, they behave in similar ways. Consumption of dietary supplements among those in this age group is under strong peer influence.⁵⁵ In fact, females more than males reported a greater use of dietary supplements, especially for weight loss.^{11,14} Because most weight loss products have not been scientifically proven to be safe,²⁸ young females should be cautious about dependence on these dietary supplements. Health educators can direct this age group to form correct norms regarding dietary supplement consumption so that sharing their experiences with products does not contribute to misuse of those products. Thus, health educators should develop effective campaign strategies for nonfamiliar consumers first, followed by those who are somewhat familiar with these products. They should emphasize scientific facts to counteract misperceptions of dietary supplement products.

For those who already consume large amounts of dietary supplements, the education should focus on self-efficacy to regulate their behavior. As the findings of the current study suggest, providing threatening information about potential side effects from misuse is not likely to be effective. As behavior change models suggest,^{35,36,56} it is critical to offer young adults tangible ideas to increase their confidence in dealing with pressures to consume dietary supplements. It might be helpful to let them refute anecdotal evidence obtained from their peers⁵⁷ rather than simply exposing them to efficacious information.

Furthermore, our findings suggest the need to reevaluate restrictions on advertising and marketing for dietary supplements and for significant policy deliberations to address oversight beyond the current Food and Drug Administration regulations based on DSHEA. Bombarded constantly by advertisements, young adult consumers may be easily swayed by false information instead of seeking accurate information about effectiveness and side effects.²⁴ Policy evaluation is critical to adolescents, young adults, and females in particular. Previous research on effectiveness and safety of dietary supplement use for these particular age groups⁵³ is limited beyond those that report strong inclination to consume a variety of dietary supplements for quick performance enhancement. Health educators can fulfill their role with active involvement in the policy formation process (e.g., the National Commission for Health Education Credentialing).^{58,59}

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