Research Article

Research of Consumption Intention of Bodybuilding Supplements: Threat and Negative Perception

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As China's fitness industry evolves from infancy to maturity, the demand for fitness medications among gym participants continues to grow. However, the drivers and influences of this consumption behavior in the Chinese context have not been adequately studied. Based on the UTAUT2 model, this study constructed a research model suitable for fitness medication consumption intention and collected data from gym participants of different backgrounds through a questionnaire survey. The study's results showed that Performance Expectations, Social Influence, Subjective Negative Perception, Threat, and Perceived Behavioral Control significantly affected consumption intention. Relative Advantage had no significant impact on consumption intention. The reasons for the results were also explored separately. This study explored the acceptance of fitness medication in the Chinese context to provide empirical support for subsequent research and analyzed the consumption psychology of fitness medication to provide a basis for the healthy development of the fitness market.

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1. Background

In the wave of rapid development of the global fitness industry, China's fitness sector has developed dramatically under the impact of European and American fitness over the past decade, spurring an increasing awareness of physical fitness and the pursuit of aesthetic standards. As more and more people engage in gym-related activities, more and more gym users want to use fitness medications to enhance physical performance, improve fitness, and shape their bodies. The usage of various

medications, including anabolic-androgenic steroids (AAS), human growth hormone (HGH), and diuretics, has attracted extensive attention for their capacity to enhance muscle growth, boost strength, reduce fat, and hasten recovery. The use of their related medications has increased proportionately. However, the spread of fitness medication poses challenges such as ethical, legal, and health concerns, and has become an important issue that the Chinese fitness community and related organizations need to face urgently. Meanwhile, despite the vast number of studies on fitness medication use globally, there are still insufficient systematic investigations in the Chinese context, especially those combining socio-cultural and consumer behavior models[1]. By employing the theoretical tools offered by the UTAUT2 model, we can investigate more deeply the logic of gym participants' consumption of fitness meds and comprehend fitness enthusiasts' purpose in consuming fitness medications. The results of the study will provide new views on understanding the consumption motivations of fitness enthusiasts and offer constructive suggestions for the healthy development of the fitness medication market. It is intended that this study will not only expand the academic understanding of fitness medication consumption behavior, but also give strong support for practical policy formation and industry standardization, and contribute to the sustainable growth of China's fitness market.

2. Rationale and literature review

2.1. UTAUT2

The Unified Theory of Acceptance and Use of Technology (UTAUT) model, proposed by Venkatesh[2], is one of the main theoretical frameworks for studying users' acceptance and utilization of new technologies[3]. To further expand the applicability and explanatory power of the UTAUT model, Venkatesh et al. further proposed UTAUT2 in 2012. Compared with UTAUT, UTAUT2 is more capable of explaining consumers' acceptance and utilization of new technologies in different environments, and the theoretical predictive power of the theory is much higher, through the analysis of published research based on UTAUT2 model, UTAUT2 is one of the main theoretical frameworks for studying users' acceptance and utilization of new technologies. Research analysis, UTAUT2 is an effective model for studying user acceptance behavior[4] Because the model has a solid theoretical foundation for studying consumer behavior and has considerable advantages in empirical research analysis, the

UTAUT2 model was chosen for this study to analyze Chinese gym-goers' consumption intentions toward fitness medications.

2.2. Fitness Medications

Fitness medications are generally categorized into general and hormone-containing drugs that are primarily used to enhance physical performance, improve fitness, or shape the body to help the user achieve specific fitness goals by promoting muscle growth, improving strength, reducing fat, or accelerating recovery[5]. Among the more common of these medications include anabolic-androgenic steroids (AAS) that induce anabolic as well as androgenic increases in testosterone levels[6], diuretics that increase the rate of urinary flow, sodium, and electrolyte excretion to regulate the amount and composition of body fluids or to remove excess fluids from the tissues[7], and human growth hormone (HGH) that increases muscle mass and strength, promotes fat loss, amplifies the effects of steroids, and steadily builds high-quality muscle[8], among others

2.3. Domestic and international research status

The use of fitness medications has now become an international topic that has generated extensive academic discussion. International research on fitness medications has evolved from the early forms of PES, such as caffeine, alcohol, and opioids, to the study of anabolic androgenic steroids and other testosterone-promoting medications that emerged in the mid-20th century[9].And focuses research perspectives on motivations for use, risk, and group characteristics of fitness people. Some studies attribute the use of medications by bodybuilders to the influence of social acceptance and mimicry, the impact and credibility of opinion leaders on social media platforms, internet celebrities, or industry experts, who reinforce the myths and trust of bodybuilders to sell the medications in question[10]. It has also been suggested that fitness medication is used because of the tension between the "extraordinary self" and the "ordinary self" in the minds of fitness people and that fitness medication becomes their "ego-enhancing" tool to fulfill their "ego" progression.[11]. Some studies dichotomize the relationship between health and substance abuse to reveal the health risks associated with medication overdose[12]. Against the background of the steady growth of research on sports nutrition supplements in Europe and the United States, and the research on fitness medication in full swing, China is relatively lagging behind in the field of fitness medication due to the influence of policy and legislation, and the research on fitness medication still remains in the branch focusing on nutritional

supplements, and mainly discusses the effects of amino acid-based nutraceuticals, such as protein powder and creatine monohydrate, on fitness[13]. This lack of research has led to the development of a morbid market for fitness medications and to loopholes in the regulatory framework. Therefore, the study of fitness medication consumption intentions in the context of Chinese society is crucial for regulating the fitness medication market, disseminating correct fitness concepts, and reducing medication abuse.

3. Research design and methodology

Along with the rise of consumer technology, the UTAUT model needed to be extended to the emerging consumer environment by emphasizing technology users' hedonic value (intrinsic motivation). This led to the incorporation of three new constructs such as hedonic motivation, price value, and habit into the original UTAUT, resulting in the novel UTAUT2 model, which demonstrated its powerful analytical and predictive capabilities by explaining approximately 74% of the variance in consumer behavioral intentions and 52% of the variance in consumer use of technology for the focal technology compared to the UTAUT[14], based on the UTAUT2 model On this study extends the basic model according to the characteristics of fitness individuals, and the Perceived Behavioral Control (PBC), which intersects with the Theory of Planned Behavior (TPB), is used as an extension of the main factors. Factors related to consumers' attitudes such as Threat (TH), Subjective Negative Perception (SNP), and Comparative Advantage (CA), which clarifies the value of the fitness supplement itself, were used as secondary factors. Therefore, in addition to the above three hypothesized factors, the other core elements of this model are Performance Expectation (PE), Social Influence (SI), and other basic elements. (See Figure 1)

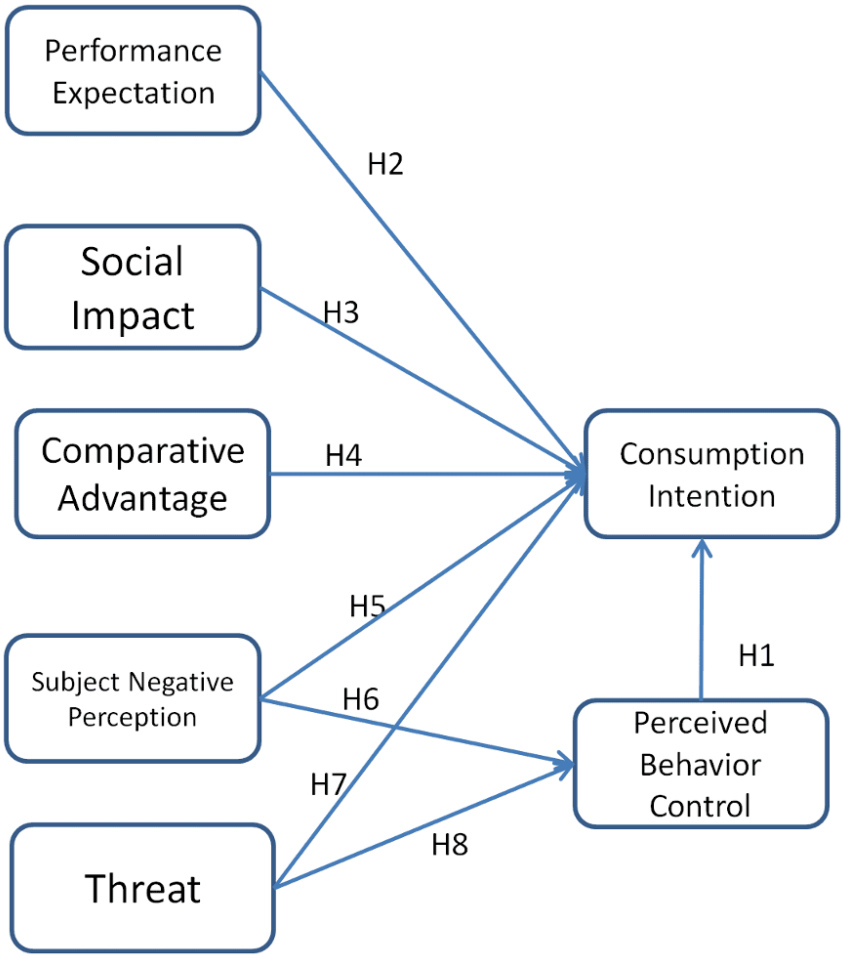

Figure 1. Theoretical model framework

3.1. Perceived Behavioral Control (PBC)

Perceived Behavioral Control (PBC) is an individual's perception of his or her ability to perform a certain behavior in a given situation, and the concept of perceived behavioral control consists of self-efficacy (which mainly deals with the ease or difficulty of performing the behavior) and controllability (the degree of performance is dependent on the actor)[15], and in Ajzen's study on the Theory of Planned Behavior, perceived behavioral control, as a part of TPB model, possesses significant influence factor, which has empirical implications for the study and prediction of consumer behavioral tendencies[16]. The main target group of this study is the fitness people in the gym. On the one hand, fitness medication is often more accessible to fitness individuals due to the influence of the atmosphere and publicity, and at the same time, the use of medication has already had a mature

program internationally[17], which has shown a good state of self-efficacy. On the other hand, the short-term benefits of fitness medications have increased the obsession and dependence on fitness medications leading to a higher degree of control over the use of medications and the ability to use medications regularly for muscle-building. Plus in Forouzan Rezapur-Shahkolai et al.'s study on factors associated with AAS use among bodybuilders under the Theory of Planned Behavior, it was noted that perceived behavioral control can (directly or indirectly) influence athletes' use of AAS[18]. Therefore because of the enhancement of perceived behavioral control in bodybuilders, it can have a direct impact on the intention to consume bodybuilding medications. Based on the above analysis, the following hypotheses were formulated in this study:

- H1: Perceived Behavioral Control (PBC) shows a positive correlation with Consumption Intention (CI).

3.2. Performance Expectations (PE)

Performance Expectation (PE) is the degree to which an individual feels that using the system will help him or her at work (perceived usefulness). The primary function of fitness medications is to help fitness individuals achieve better physical form. In using fitness medications, fitness individuals often expect to gain significant physical advantages, such as a significant increase in muscle size, significant enhancement of shape status, etc., and this expectation may lead fitness individuals to increase the purchase and use of fitness medications. Nur Hayati in his study on the relationship between body image and steroid use states that fitness individuals who are subjected to their own or the outside world's negativity about their Nur hayati's study on the relationship between body image and anabolic steroid use states that fitness individuals who are negatively influenced by their own or external perceptions of their bodies are more likely to aspire to a better body image and that there is a significant relationship between body image and anabolic steroid use[19]. A study by AM Santos on the steroid use patterns of Brazilian men defined AAS as "aesthetic stimulants", emphasizing that AAS use is not an end but a process for bodybuilders and that the use of a single fitness supplement is not enough to make muscles bigger. It also suggests that the reason behind it is the pursuit of an aesthetic body shape by fitness individuals, who regard fitness as a life rather than a hobby[20]. Based on the above analysis, the following hypotheses are proposed in this study:

- H2: Performance Expectation (PE) is positively related to Consumption Intention (CI)

3.3. Social Impact (SI)

In both the TAM and UTAUT models, social influence (SI) is seen as a key factor influencing technology acceptance and use. Social influence refers to the extent to which an individual's beliefs, attitudes, and behaviors are influenced by the people around him or her (e.g., friends, family, coworkers, and the sociocultural environment). On the one hand, in the general environment of the increase of fitness people in China, influenced by the ideas of the booming international bodybuilding industry, the acceptance of supplement knowledge in gyms, the increase in the number of people who promote medications, and the gradual increase in the use of fitness medications. At the same time, the increased exposure of bodybuilding competitors such as Chen Kang and Deer Chenhui on online video platforms has attracted a large number of fitness fans and has brought domestic and international commercialized events such as Olympia, New York PRO, and China National Bodybuilding Championships (CBBA PRO) closer to the public's attention. Attention to fitness awareness. Their body image, self-promotion videos, professional competitions, and other social influences have led to the promotion of the concept of fitness medications. In the field of social media communication, Luke Thomas Joseph Cox's study on the influence of narrative typologies related to social media influencers such as YouTube on the intention to consume fitness medication mentions that PIED (image enhancing medications) influences enhance fitness medication through three ways: traditional narratives based on science, traditional narratives based on experience, and experimental narratives based on experience. Diffusion[21]. Thus the social factors around the fitness individuals increase the desire of fitness individuals to purchase fitness medications all the time. Based on the above analysis the following hypotheses are proposed in this study:

- H3: Social Influence (SI) shows a positive correlation with Consumption Intention (CI)

3.4. Comparative Advantage (CA)

Comparative advantage (CA) is an important part of the marketing process and an important factor in commodity market forecasting. Comparative advantage (CA) in commodity marketing refers to the higher value or utility of one commodity over another. In the field of fitness medications, the comparative advantage factor is infinitely magnified due to the short-term effectiveness and comprehensiveness of fitness medications. Fitness individuals may give more weight to the effectiveness of a supplement than to its adverse effects. The use of dietary supplements DS (protein powders, etc.) and ketogenic diets (low-fat, medium-protein, high-fat diets) are well known in the

fitness arena for muscle building and fat loss. Regarding the effects possessed by the ketogenic diet Leaf A et al. in their study related to the ketogenic diet pointed out that the effects of the ketogenic diet on athletic performance are largely neutral or detrimental, and that although the ketogenic diet has some benefits for fat loss, the cycle is longer, and pointed out that studies have shown that a high carbohydrate diet in strength training is superior in terms of increasing strength or maintenance[22]. The same Ayşe Gunes-Bayir study on potentiating nutritional supplements states that proteins/amino acids, fats, vitamins, minerals, and other substances can improve performance, lean body mass or muscle mass, and body fat content with a regular and balanced diet. However, there are drawbacks of limited effectiveness and long cycle times[23]. In Luuk Hilkens' study on the use of dietary supplements, anabolic androgenic steroids (AAS), and selective androgen receptor modulators (SARM) among male gym users, it was noted that 83% of the people in the study were habitual users of dietary supplements, with about 20% of the participants being dissatisfied with their bodies, and it was also noted that the use of AAS was gradually increasing[24]. Based on the above research and reasoning, fitness enthusiasts may exhibit impatience when using nutritional supplements and common methods represented by the ketogenic diet, potentially due to the lengthy cycles involved. This impatience may lead them to choose performance-enhancing substances (such as anabolic steroids) to shorten their muscle gain or fat loss cycles. Based on the above analysis, the following hypotheses were proposed in this study:

- H4: Comparative Advantage (CA) is positively related to Consumption Intention (CI)

3.5. Subjective Negative Perception (SNP)

Subjective Negative Perception (SNP) refers to the consumer's subjective perception of the drawbacks of an item. Due to subjective limitations, this study only discusses the subjective opinions of fitness individuals. In Dr. Alex K. Bonnecaze's study of Characteristics and Attitudes of Men Using Anabolic Androgenic Steroids (AAS), it was noted that many men using AAS were concerned about their health but did not perceive the risk of serious side effects to be great enough to consider discontinuing, and additionally, the majority of AAS-using men reported difficulty discontinuing the medication over the long term. While half of the respondents tried to quit, more than 60% restarted AAS use. Recidivism was common even after long-term discontinuation[25]. Based on the above study, it can be inferred that the negative perception of fitness medication is weak and that fitness individuals will reduce the dosage of medication during the negative effects of the medication to minimize the harm of the

medication while maintaining body image management and minimizing the effects of withdrawal. During positive feedback, the dosage of the medication is dosed based on physical data. This phenomenon usually persists after the first use of fitness medications, so fitness individuals have complex attitudes and uniform behaviors toward fitness medications. In the above discussion, it is concluded that fitness individuals continue to use fitness medications even after they perceive the negative effects of fitness medications and increase perceived behavioral control (strict control of dosage and period of use) to achieve the goal of limiting the negative effects. From the above discussion, it is concluded that fitness individuals continue to use fitness medications even after perceiving the negative effects of fitness medications and increasing perceived behavioral control (strict control of dosage and period of use) to limit the negative effects. Based on the above analysis, the following hypotheses are proposed in this study:

- H5: Subjective Negative Perception (SNP) shows positive correlation with Consumption Intention (CI)
- H6: Subjective Negative Perception (SNP) shows a positive correlation with Perceived Behavioral Control (PBC)

3.6. Threat (TH)

Threat (TH) refers to the objective sense of the characterization of the harm caused by a good to a consumer. Unlike Subjective Negative Perception (SNP), Threat is objective and in the fitness domain, Threat symbolizes a relatively greater degree of severity, which is not diminished by the fitness person's subjective awareness. Additionally, fitness individuals who perceive fitness medication as threat in use may engage in behaviors such as periodic dose reductions or discontinuation of the medication, which has an impact on the willingness to consume fitness medication. Legal inadmissibility is also a threat factor for fitness medications. Michał Stojko, in his innovative report on the effects of anabolic androgenic steroids (AAS) misuse, has presented the various side effects of AAS and has called for a reduction in the use of AAS[26]. Muneera Ahmed Alkhelaifi presents the history of the formation of various regulations and the reasons behind them in the study of doping in sports and current regulations from the perspective of laws and regulations prohibiting the use of AAS and also analyzes several factors that contribute to the increase of doping incidents in his study and refers to the use of medication to enhance athletic performance as unethical behavior, emphasizing the importance of reducing medication proliferation through incarceration and fines to reduce

medicine abuse[27]. The above analysis suggests that factors such as the threat to higher levels of the body and the threat of laws and regulations contained in the threat nature may discourage the use of fitness medications such as AAS by fitness individuals. At the same time, along with the increase in threats, self-efficacy and controllability decrease, and perceived behavioral control becomes weaker along with the increase in risk. Based on the above analysis, the following hypotheses are proposed in this study:

- H7:Threat (TH) shows a negative correlation with Consumption Intention (CI)
- H8:Threat (TH) showed a negative correlation with perceived behavioral control (PBC)

4. Methodology

4.1. Data collection and participant background

The main research of this study is to analyze the intention of gym participants to consume fitness medication in the context of China, which is gradually increasing. As this study involves the use of fitness medication, the group of people to be filled in the questionnaire was screened before the questionnaire was administered to ensure that those who filled in the questionnaire had some experience with fitness and medication use, to ensure the validity of the experimental data, and the empirical validity and generalizability of the results of the experiment. The data for this study were collected between November and December 2024, and gym users from their local area were surveyed, to expand the sample size, fitness enthusiasts from all over China were interviewed through real-time chatting programs such as WeChat, QQ, and so on. The data was collected using a Questionnaire. The data were collected using the application "Questionnaire Star" and the questionnaires were collected by using a combination of offline and online methods. To ensure that the questionnaires were properly filled out and that those who filled them were motivated to do so, cash or red packets were offered to those who filled them out as a reward. After eliminating invalid data, 388 valid questionnaires were obtained.

4.2. Measurement

This questionnaire was divided into two parts. In the first part, basic demographic information of the participants was collected to safeguard, among other things, the participants' years of fitness experience (see Table 1).

Name	Options	Quantity	Percentage(%)	Cumulative Percentage(%)
Gender	Male	195	50.26	50.26
	Female	187	48.2	98.46
	Others	6	1.54	100
Education level	Junior high school and below	52	13.4	13.4
	High School	89	22.94	36.34
	College or Bachelor's Degree	180	46.39	82.73
	Masters and above	67	17.27	100
Years of training	Less than 1 year	116	29.9	29.9
	1-3 years	135	34.79	64.69
	3-5 years	83	21.39	86.08
	5 years and above	54	13.92	100
Total		388	100	100

Table 1. Basic Demographic Information

In the second part, there are 25 measurement items that were subdivided under seven broad hypotheses: performance expectations, social influence, subjective negative perceptions, threats, comparative advantages, perceived behavioral control, and consumption intentions. The questionnaire measurement items were adapted from previous relevant journal literature and slightly adapted to the uniqueness and characteristics of fitness supplements. Each item was assessed on a 7-point Likert scale ranging from 1 "strongly disagree" to 7 "strongly agree"(see Table 2).

Variables	Measurements
Perceived Behavioral Control[16][18]	1. I can make good choices about which fitness medications to use 2. I can accurately manage the dosage and timing of my fitness medications. 3. I was able to stick to my fitness supplements under any conditions.
Performance Expectations[19]	1. Fitness medications Safeguard the Training Experience. 2. Fitness medications Enhance Training Effects. 3. Fitness medications can replenish the body's missing elements and keep it healthy. 4. Fitness medications can boost self-confidence.
Social Impact[10][21]	1. Substance use among the fitness population around them. 2. Online media popularize the benefits of fitness medications. 3. Fitness substance use as a group ethos. 4. Fitness stars use and recommend or imply fitness medications.
Comparative Advantages[5][24]	1. Fitness medications are more effective than supplements 2. Fitness medications are cheaper to spend overall versus supplements. 3. Choosing the right medication is less difficult than learning a variety of training styles.
Subjective Negative Perceptions[26]	1. Unacceptable taste or physical sensation of fitness medication 2. The use of fitness medications triggers negative body reactions. 3. The use of fitness medications affects normal quality of life. 4. Fitness medications are expensive and unaffordable.
Threat[25][26][27]	1. Purchased fitness medications are not determined to be safe and addictive 2. Lack of literature data to support some fitness medications 3. Purchasing fitness medications subject to legal risks
Consumption Intent[3]	1. I have an interest in fitness medications 2. I would recommend the purchase of fitness medication to people around me who are working out.

Variables	Measurements
	3. I will continue to purchase and use fitness medications in the future. 4. I will learn about fitness medications.

Table 2. Questionnaire Dimensions and Specific Content

4.3. Data analysis methods

Based on the assurance of reliability and empirical validity provided by MA Memon[28], this study used Partial Least Squares Structural Equation Modeling (PLS-SEM) analyses, specifically Smart PLS4, to test the developed hypotheses and to analyze the proposed research model. The data analysis in this study was conducted in three main ways. In the first part, the study data were ensured to be free of CMB issues by testing for common method bias. In the second part, measurement model assessment was conducted to assess the validity and reliability of the study through methods such as validated factor analysis and Cronbach's alpha, which verified the relationship between the observed variables and the latent factors, as well as the internal consistency and convergent validity of each dimension to ensure the validity of the measurement model. In the third part, the data model is evaluated for model structure, aiming to check the predictive ability of the model and the relationship between the structures, detecting the influence of factors including perceived behavioral control, performance expectations, social influence, relative advantage, subjective negative perception, and threat hypotheses on consumption intentions through path coefficient analysis, and judging whether the hypotheses are reasonable and valid based on their significance.

5. Results

5.1. Common Methodological Bias (CMB)

Common Method Bias (CMB) is a systematic bias resulting from the same methods used when collecting data through questionnaires or self-reports. This bias may affect the validity of the findings of the study. The study was susceptible to common methodological bias because the survey involved self-reporting (both the independent and dependent variables were taken from the same respondents). Therefore VIF analysis was conducted using the PLS-SEM model in Smart PLS4 for

common method detection. According to Kock, N[29] the VIF in the internal model derived from the standard fruit full covariance test is equal to or less than 3.3, the model is considered to be free of CMB. The results analyzed in the study showed (Table 3) that all the VIFs were in the range of 2.117-3.135, therefore there was no issue of CMB in this study.

	SNP	TH	PBC	CI	CA	SI	PE
SNP		2.128					
TH							
PBC	2.492	2.283					2.117
CI	2.673	2.596			2.530		
CA							
SI	3.135				2.795		2.117
PE	2.808	2.698			2.663		

Table 3. Internal Model Matrix Of Collinearity Statistics (VIF)

5.2. Measurement model evaluation

Referring to the measures in OJ Aburumman[30], the model data were tested the results of reliability and validity in Table 4. The first part of the internal consistency reliability test mainly includes both Cronbach's alpha (CA) and composite reliability (CR). According to CG Forero[31] and MT Kalkbrenner[32], it is concluded that in general testing studies, it is considered that usually, values between 0.70 and 0.95 for CA and CR are widely accepted values. As shown in Table 4, Cronbach's alpha values for all dimensions ranged from 0.871 to 0.945 and the composite reliability values ranged from 0.872 to 0.948. Thus the model of this study has reliability.

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	Cronbach's alpha	Composite Reliability	Average variance extracted (AVE)
TH	0.945	0.948	0.901
PBC	0.923	0.923	0.886
CI	0.900	0.901	0.770
SI	0.890	0.890	0.752
PE	0.889	0.894	0.751
SNP	0.883	0.883	0.741
CA	0.871	0.872	0.722

Table 4. Construct reliability and validity

The second part of the convergent validity test. In the usual sense of validated factor analysis, convergent validity is analyzed by the two indicators[33][34]., AVE and CR, and if the AVE value for each factor is greater than 0.5 and the CR value is greater than 0.7, it indicates good convergent validity. As shown in Table 4 AVE values are all between 0.741 to 0.901 and CR values are all between 0.872 to 0.948. Therefore the convergent validity of the model in this study is acceptable. The structure is valid.

5.3. Assessment of model structure

In structural model evaluation, this study refers to the steps mentioned in Marko Sarstedt et al.'s study on advances in the application of PLS-SEM in market research[35]. To validate the hypothetical model proposed in this study, an analytical study was conducted through path coefficients (B), standardized path values (β), and labeled differences (SE). The study validates the effect of factors including perceived behavioral control (PBC), performance expectation (PE), social influence (SI), comparative advantage (CA), threat (TH), and subjective negative perception (SNP) on consumption intention (CI) for further observational assessment of the model data showed in table 5

In general, the four factors of perceived behavioral control, performance expectation, social influence, and subjective negative perception showed a positive correlation tendency to consumption intention,

specifically the effect of perceived behavioral control on consumption intention (B=0.216, T=2.321, p≤0.050) H1 reached a significant level and showed a positive correlation, which indicated that the stronger the perceived behavioral control was, the stronger the consumption of fitness medication was among the fitness individuals. The effect of performance expectation on consumption intention (B=0.234, T=3.450, p≤0.001) H2 reaches a significant level and presents a positive correlation, indicating that fitness people's expectation of fitness medication and dissatisfaction with their own body influences the level of consumption of fitness medication. The effect of social influence on consumption intention (B=0.270, T=4.284, p≤0.001) H4 reaches a significant level and shows a positive correlation, which supports the hypothesis that fitness individuals influenced by self-media, celebrities, and people around them will increase the consumption intention of fitness supplements. The effect of negative subjective perception on consumption intention (B=0.193, T=2.801, p≤0.005) H5 reached a significant level and showed a positive correlation, indicating the hypothesis that negative subjective perception will intensify the increase in consumption intention of fitness people. In subjective negative perception on perceived behavior control (B=0.443, T=8.587, p≤0.001), H6 was verified and subjective negative perception showed a positive correlation on perceived behavior control. The threat on perceived behavioral control (B=0.425, T=10.482, p≤0.001) showed a positive correlation, which is not in line with the hypothesis that threat shows a negative correlation on perceived behavioral control, and may be considered as a factor of the law, as well as other threat factors that reduce the desire of fitness people for fitness supplements. The effect of threat on consumption intention in (B=-0.088, T=2.150, p≤0.05) threat on consumption intention is not significant; the factors considered are psychological effects of fitness individuals and limitations of gender, age, and other factors. The p-value of Relative Advantage on Consumer Intention is greater than 0.05 and hypothesis H3 has not been supported. H8 is against the hypothesis and the H7 hypothesis is not significant. The H3 hypothesis is not supported. Table 5 shows the results.

	Assumption Path	B	β	SE	T	P	Supported Or not
H1	PBC→CI	0.216	0.211	0.093	2.321	0.020	Yes
H2	PE→ CI	0.234	0.238	0.068	3.450	0.001	Yes
H3	CA→ CI	0.054	0.047	0.088	0.609	0.542	No
H4	SI→ CI	0.270	0.272	0.063	4.284	0.000	Yes
H5	SNP→ CI	0.193	0.197	0.069	2.801	0.005	Yes
H6	SNP→	0.443	0.442	0.052	8.587	0.000	Yes
H7	TH→ CI	-0.088	-0.084	0.041	2.150	0.032	Yes
H8	TH→ PBC	0.425	0.427	0.041	10.482	0.000	Yes

Table 5. Hypotheses Testing

6. Discussion

In the study, by extending the UTAUT2 model, the consumption intentions of fitness individuals towards fitness medicines in the Chinese context are investigated and the key factors are analyzed. Many conclusions were drawn.

Perceived Behavioral Control showed a positive correlation with Consumption Intent, which indicates that Chinese bodybuilders' self-efficacy gradually increased with the readily availability of fitness medication and the readily learning of the use program. Coupled with the influence of the international bodybuilding culture, which is gradually taking hold in people's minds, the desire for bigger and stronger muscles is reinforced, and the frequency and regularity of the use of fitness medication is quantified, and controllability is enhanced. The increased self-efficacy and controllability argue for a progressively stronger link to consumption intentions in the Chinese context. Further arguments are made for the research of Rezapur-Shahkolai et al. on perceived behavioral control affecting bodybuilders' use of AAS[18] and Hagger, Martin S et al. on the moderating role of perceived behavioral control in the theory of planned behavior[36].

Performance Expectation demonstrates a positive correlation with Consumption Intent. This finding suggests that influenced by a specialized training atmosphere and the proliferation of professional events, fitness enthusiasts are increasingly transforming fitness from a casual hobby into a lifestyle and, in many cases, a profession. This transition from personal freedom to professional discipline reflects a significant shift in priorities and attitudes toward fitness. In Victoria Torres and Pablo's framework of social cohesion in bodybuilding, the gym environment is described as having a "negative energy framework"[37]. Within this context, a lone-wolf mentality often prevails, contributing to a dreary and competitive atmosphere. This environment fosters arrogance and jealousy while simultaneously heightening feelings of inferiority among gym-goers and intensifying their desire to become stronger. Additionally, exposure to external information amplifies both self-negativity and the negativity of others, further fueling the need for "aesthetic stimulants," such as anabolic-androgenic steroids (AAS). These observations align with the findings of previous studies[19] [20], which validate the hypothesis.

Social Impact demonstrates a positive correlation with Consumption Intent. Based on the assumption that this hypothesis is valid, it can be concluded that the Chinese sociocultural context significantly influences fitness enthusiasts, particularly those exposed to bodybuilding-related media. These individuals are increasingly drawn to the ideal of the "behemoth body," resulting in a growing demand for fitness medications. As the fitness culture and atmosphere in China align more closely with international standards, many fitness enthusiasts encounter natural physical limitations that hinder their ability to achieve sustained progress. Faced with these barriers, their fitness concepts and aspirations continue to evolve, and their desire to push past these limitations leads them to embrace elements of international bodybuilding culture, including the use of fitness medications. This phenomenon aligns with Leon Festinger's 1954 theory of social comparison[38], which suggests that individuals evaluate their current level of self-assessment by comparing themselves to others, particularly those portrayed in media or within their social circles. However, when their abilities or achievements fall short in these upward comparisons, feelings of inferiority emerge. These feelings, in turn, drive the formation of higher personal standards and an increased pursuit of rapid physical transformation. In this context, fitness medications, including anabolic-androgenic steroids (AAS), become a perceived solution to these psychological pressures and physical aspirations. Over time, bodybuilding within this framework begins to resemble a form of religiosity. Fitness enthusiasts adopt a near-devout dedication to their routines, treating gym equipment as sacred objects in a daily

pilgrimage and viewing medications like AAS as tools of worship. For these individuals, the "God of Steroids" becomes a symbol of their longing for strength and muscular perfection, with the use of medications seen as a means to achieve blessings in the form of enhanced physical capabilities.

Under the conditions that the hypotheses are valid, fitness individuals' personal subjective negative perception of fitness drugs presents a positive correlation with consumption intention and perceived behavioral control. As stated in the above factors, subjective negative perceptions mainly come from fitness individuals' own perspectives, and fitness individuals may be influenced by social factors in the process of developing fitness addiction. Mia Beck Lichtenstein et al. highlight that obsessive passion is a significant driver of exercise addiction, noting a 7.7% prevalence of high-risk individuals among fitness participants. Those at greater risk tend to use medications more frequently and engage in competitive workouts[39]. Exercise addiction increases the likelihood of supplement intake, as supported by Çınaroğlu M.[40], who argues that neurotransmitter fluctuations, particularly in response to anabolic steroids and performance-enhancing drugs (PEDs), are linked to addictive behaviors. These substances can temporarily enhance confidence and stamina by elevating dopamine and serotonin levels, fostering a rewarding experience that promotes continued use. Conversely, abstaining from these substances often leads to anxiety and a feeling of loss, reinforcing the addictive cycle. This cycle supports Dr. Alex K. Bonnecaze's assertion that fitness users struggle to escape the temptation of medications[25], thereby enhancing their perceived behavioral control and diminishing negative perceptions, which ultimately increases their intent to consume these products.

In this study, Threat has a negative correlation with Consumption Intentions, while showing a positive correlation with Perceived Behavioral Control. Relative Advantage does not significantly affect Consumption Intentions. Given that these results contradict previous hypotheses; this research aims to analyze the psychological reasons why fitness enthusiasts continue to use performance-enhancing substances despite facing physical threats and legal restrictions. First, from an internal perspective, according to Leon Festinger's Cognitive Dissonance Theory proposed in 1957[41], individuals experience psychological stress when engaging in behaviors that contradict their beliefs, values, or self-image. To alleviate this cognitive dissonance, individuals typically adjust their cognitions to achieve consistency. According to the review by AH Yahya et al[42]. on cognitive dissonance theory and its relevance to contemporary social issues, fitness enthusiasts seek to enhance muscle strength through the use of performance-enhancing substances. However, conflicts arising from legal constraints and negative publicity can trigger cognitive dissonance. In such cases, fitness

practitioners may rationalize their substance use by reassessing risks, consequently underestimating potential dangers or overestimating possible benefits. Self-Determination Theory (SDT) explained in the study of self-determination theory. This theory differentiates between intrinsic motivation, represented by Cognitive Evaluation Theory (CET), and extrinsic motivation, as proposed by Organismic Integration Theory (OIT)[43]. Together, these concepts illuminate the reasons behind fitness enthusiasts' obsession with Bodybuilding medications. The desire for performance-enhancing substances arises from a combination of intrinsic and extrinsic motivations. Initially, fitness enthusiasts develop curiosity about these substances due to an increase in fitness knowledge. Upon actively seeking information and using performance-enhancing drugs, they receive external rewards (such as increased muscle mass and improved physique) along with intrinsic rewards (including external praise and avoidance of perceived social exclusion). This self-identification reinforces their positive view of substance use, making it challenging to alter their perceptions under the influence of legal and other external factors, thus establishing cognitive inertia and enhancing perceived behavioral control.

Second, from an external perspective. The influence of Social Identity Theory suggests that fitness enthusiasts often pursue a positive social identity within their groups to gain recognition. According to research by Jake Harwood[44], individuals in the fitness community tend to enhance their muscle mass to receive praise from their peers. Meanwhile, ordinary individuals from the general population may experience self-dissatisfaction due to influences from social media, leading to self-marginalization and gradual integration into the fitness in-group. This cycle may explain the gradual increase in both the fitness population and the use of performance-enhancing substances in China.

Finally, the low impact of perceived threat on consumption intentions may be related to gender differences. Afroditi Zartaloudi and other scholars have shown that women are more likely to experience body image anxiety due to high BMI[45], contrasting with men who typically pursue muscle hypertrophy. Survey results reveal that women are more likely to oppose the use of performance-enhancing substances, while men exhibit either supportive or indifferent attitudes. Considering the balanced gender distribution in the survey, women's opposition offsets men's support, resulting in a diminished influence of perceived threat on consumption intentions.

7. Conclusions and future research

Based on the extended Unified Theory of Acceptance and Use of Technology (UTAUT2) model, this study provides insights into the key factors influencing the consumption intentions of fitness medications—both general and hormonal—among fitness enthusiasts in the Chinese social context. The study explores the impact of perceived behavioral control, subjective negative perception, performance expectation, and social influence on the choice of fitness medications. It also examines why some hypothesized factors deviate from expected results, attributing this deviation to psychological influences and poor gender differentiation in the study. These findings suggest that perceived behavioral control (e.g., self-efficacy), social cohesion frameworks, social comparison theory, exercise addiction and the AAS addictive cycle, cognitive dissonance theory, self-determination theory, social identity theory, and anxiety all play significant roles in influencing fitness enthusiasts to use fitness medications.

However, this study has certain limitations. It does not differentiate between male and female fitness enthusiasts in terms of their fitness goals and motivations, which results in the omission of gender-specific factors that could influence fitness supplement consumption intentions. Additionally, the research does not account for the number of years an individual has been involved in fitness, leading to discrepancies in perceptions between aggressive fitness participants with less experience and more conservative fitness participants with longer fitness histories. Differences in fitness methods and philosophies further contribute to unconfirmed relative advantages. Future research should explore trends in psychological changes among fitness enthusiasts as their experience increases and identify the factors that influence these changes.

Finally, the study suggests learning from the "soft persuasion" approach described by Daniel C. Mattingly et al.[46]. This approach involves utilizing self-media, official channels, and other continuous promotional efforts to propagate accurate and constructive ideas. Promote healthy fitness concepts more effectively.

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