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Associated with Delhi Pharmaceutical Sciences & Research University
Copyright© 2013-20 IJDRA**Research Article****Perception, sources and consumption pattern of health supplements in Bhutan****Kunzang Dorji*^a, Gyelwa Kuenzom^a, Dawa Tshering^a, Tashi Dhendrup^a, Kinley Penjor Tshomo^a, Kinga Jamphel^b**^a Drug Regulatory Authority, Royal Government of Bhutan, Thimphu, Bhutan^b Bhutan Medical and Health Council, Royal Government of Bhutan, Thimphu, Bhutan**Abstract**

Though health supplements are purported to supplement diet, they are associated with risk to health. The regulatory authorities restrict marketing of health supplements for the treatment or prevention of disease. However, aggressive marketing fueled by the increased quest for improving overall health and availability has led to increased use of health supplements. To analyze the risk and design effective regulatory strategies, this study was conducted. This study reports the prevalence, source, consumption pattern and public perception of health supplements in Bhutan. A cross-sectional quantitative study was carried out from 2018 to 2019 covering major towns of all the 20 districts of Bhutan. The sample sites were selected based on convenience. A total of 463 participants were randomly selected and interviewed using a structured survey questionnaire. The data collected was analyzed using Microsoft Excel. The study revealed that 58.7% (n=272) of the respondents knew about the health supplements while 31.3% (n=145) of respondents used health supplements in the last 12 months prior to the survey. It was reported to be used mostly by the younger age group (21-30 years) and they were mostly influenced by friends 61.4% (n=89). 77.2% (n=112) of the users perceived that the health supplements they used were effective and only 18.6% of the users reported consulting health professionals prior to use. This study concludes that most of the users are driven by aggressive marketing strategies, thereby prompting regulatory agencies to demystify wrong beliefs and create awareness on the health risks with support of the health professionals targeting the young population through various platforms.

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E-mail address: kunzang46@gmail.com (Kunzang Dorji).**1. Introduction**

Health supplements are products used to supplement diet but are not to be used as medicines for prevention, diagnosis, treatment, or mitigation of diseases. (1) Health supplements are marketed in many forms such as tablets, capsules, juices, pills, syrups, powders, tea, etc., and they generally contain amino acids, enzymes, vitamins and minerals. They are also known as dietary supplements or natural products.

Few fiber rich dietary supplements when consumed at recommended levels have health benefits though it cannot be equated with the fiber from the whole food. (2) Health supplements because of vitamin D are also marketed to reduce colon, breast, pancreas, and prostate cancers though now there are now evidences to support increased risk of cancers. (3)

Many health supplements come from natural sources, but Knudsen-Gerber (4) warns buyers that natural does

not always mean safe. They are associated with risk to health besides financial implications. Many supplements contain active ingredients that have strong biological effects in the body. They may also interact with other medications and result in complicated health outcomes. (5) For these reasons, regulatory authorities restrict marketing of health supplements for the treatment or prevention of disease. However, they are aggressively marketed as products that address symptoms of illness as well as maintain or improve overall health. They can also be purchased online besides being easily available from grocery shops, pharmacies and supermarkets and it is used by all age groups irrespective of socioeconomic status. Thus, aggressive marketing fueled by the increased quest for improving overall health and wide availability has led to increased use of health supplements all over the world. (6,7)

There is a lack of global consensus on the definition of health supplements with wide variations in regulatory

frameworks in different countries. (8) In Bhutan, until 2018, health supplements were not regulated, and they were widely promoted through pyramid and Ponzi business schemes resulting in increased use including reports of some patients replacing prescription medicines with supplements. There were few anecdotal evidences of adverse drug reactions following use of health supplements. Considering such risks and concerns, the policy makers directed the Drug Regulatory Authority to regulate health supplements. (9-11) The Guideline for Regulating Health Supplements, which was developed in 2018 defines health supplements and outlines procedures for regulation in Bhutan.

With the increased use of health supplements, it is important to understand the types, sources, and consumption trends to analyze the risks and accordingly design effective regulatory strategies. This study reports the prevalence, source, consumption pattern and public perception of health supplements in Bhutan.

2. Materials and Methods

This was a cross-sectional quantitative study carried out from 2018 to 2019 covering major towns of all the **Table 1.** Dzongkhag-wise respondents (Male/Female)

Name of Dzongkhag	No. of respondents	Male	Female
Western Region			
Thimphu	143 (30.9%)	72	71
Punakha	59 (12.7%)	25	34
Chukha	36 (7.8%)	16	20
Paro	31 (6.7%)	18	13
Haa	2 (0.4%)	1	1
Gasa	2 (0.4%)	2	0
Samtse	10 (2.2%)	5	5
Eastern Region			
Monggar	13 (2.8%)	10	3
Samdrup Jongkar	14 (3%)	9	5
Trashigang	10 (2.2%)	5	5
Trashiyangtse	4 (0.9%)	3	1
Pemagatshel	6 (1.3%)	5	1
Lhuntse	4 (0.9%)	3	1
Central Region			
Wangduephodrang	81 (17.5%)	30	51
Bumthang	4 (0.9%)	2	2
Sarpang	14 (3%)	13	1
Trongsa	5 (1.1%)	3	2
Dagana	11 (2.4%)	11	0
Tsirang	8 (1.7%)	7	1
Zhemgang	6 (1.3%)	6	0
Total	463	250	213

Oriens' products 54% (n=250) were perceived to be the most popular followed by products of Patanjali 46.7% (n=216), MagneSSa 35.4% (n=164), and Herbalife Nutrition 14.3% (n=66). Products from companies such as K-Link Healthcare Pvt. Ltd., DNX Health and Herbal Products, Oriflame and Himalaya were less popular. Oriens and MagneSSa products were also reported to be widely used compared with others.

20 districts of Bhutan. The sample sites were selected based on convenience and wide availability of health supplements. Data were collected through face-to-face interviews using a structured survey questionnaire. In a few cases the interview questionnaires were shared through email. A total of 463 participants were randomly selected and interviewed. The data collected were analyzed using Microsoft Excel and interpretation was done through focus group discussions and comparison of findings of other similar studies in other countries.

3. Results

Out of 463 respondents, 46.01% (n=213) were female and 53.99% (n=250) were male (*Table 1*). The youngest respondent was 15 years old while the oldest was 68 years. 58.7% (n=272) of the respondents were very aware of health supplements while the rest were only partially aware or not aware at all. Majority of the respondents had formal education, 39.5% (n=183) had a bachelor's degree followed by Class XII (29.5%, n=135).

However, as per the internal records of the Drug Regulatory Authority, tea products with health claims were found to be rampant in the market followed by products indicated for weight loss.

Most respondents obtained their information on health supplements from friends and social media or the internet. In addition, marketers, health professionals,

family members and colleagues also were the source of information (Figure 1).

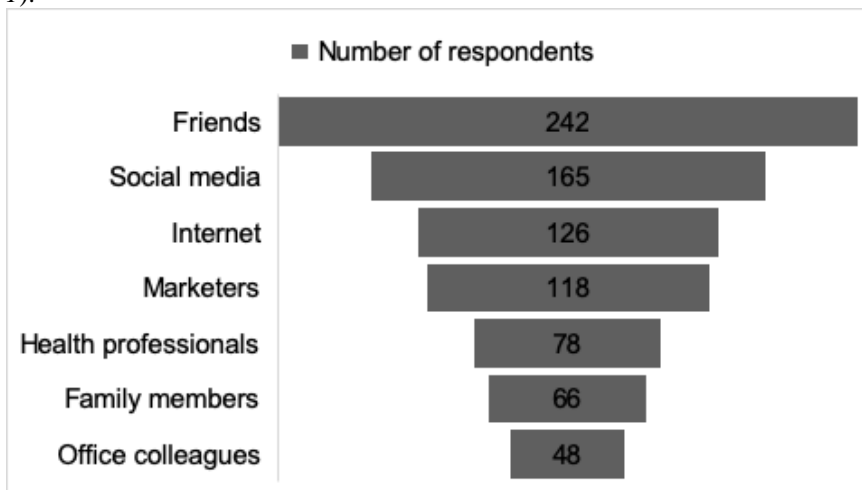


Figure 1. Source of Information of health supplements

Only 31.3% (n=145) of respondents used health supplements in the last 12 months prior to the survey and these were mostly influenced by friends 61.4% (n=89) followed by family members 25.5% (n=37), healthcare professionals 20.7% (n=30), office colleagues 10.3% (n=15) and manufacturers 9% (n=13). Products were obtained from marketing agents 43.4% (n=63), friends 36.6% (n=53), family members 14.5% (n=21), health professionals 12.4% (n=18) and the rest were imported personally directly or through online sources. One-third of those who use health supplements are regular users while more than one-fourth used at least once a week (Table 2).

Table 2. Frequency of usage of health supplements

Frequency of use	Number of people	Percentage
Daily	57	39.3%
Sometimes (once or twice a week)	40	27.6%
Occasionally (at least once in last 12 month)	48	33.1%

Only 83.5% (n=111) of the respondents reported remembering correctly on how to use health supplements. 14.5% (n=21) of the users reported replacing prescription medications with health supplements while 28.3% (n=41) of the users reported using health supplements concomitantly with other medicines. The medicines replaced by supplements included cough and cold remedies, antihypertensives, antidepressants, analgesics, gastrointestinal medicines, and antidiabetics. Health supplements were reported to be used mostly by the younger age group between 21-30 years (Figure 2)

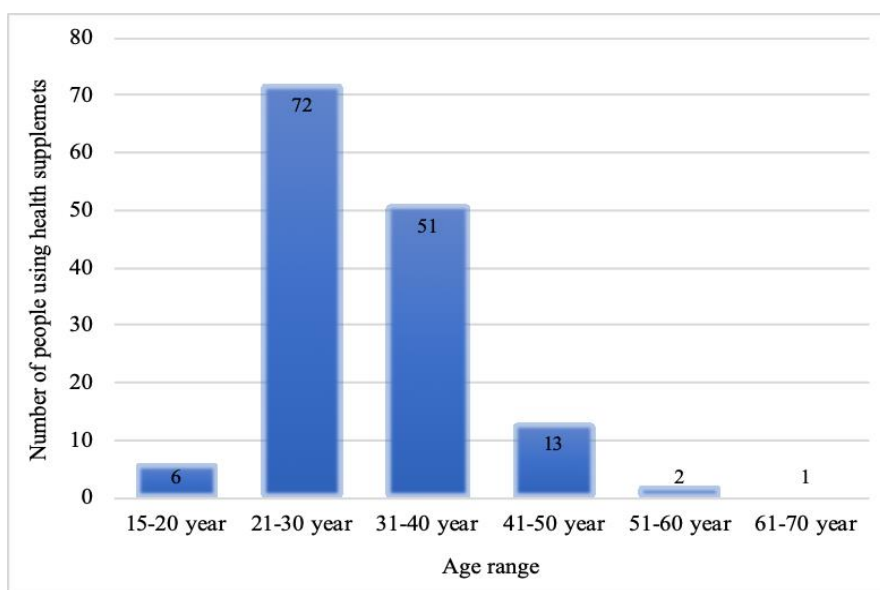


Figure 2. Usage of health supplements according to age range

77.2% (n=112) of the users perceived that the health supplements they used were effective while 22.8%

(n=33) perceived they did not get benefits or drawbacks. Three respondents (2.1%) who used health supplements

reported complications after its use. Only 18.6% of the users reported consulting health professionals prior to use of health supplements stating that the products were of natural origin, effective, safe without any side effects and certified by international companies. Lack of awareness was found as one of the reasons for not consulting health professionals before taking any health supplements.

Table 3. Satisfaction level of the respondents

Queries related to Health Supplements	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very dissatisfied
Benefits	71 (15.30%)	130 (28.08%)	240 (51.84%)	17 (3.67%)	5 (1.08%)
Role played by DRA in advocating safety	109 (23.54%)	161 (34.77%)	143 (30.88%)	35 (7.56%)	15 (3.24%)
Information received	57 (12.31%)	164 (35.42%)	190(41.04%)	40 (8.64%)	12 (2.59%)
Availability	43 (9.29%)	160 (34.56%)	217(46.87%)	36 (7.78%)	7 (1.51%)
Prices	37 (7.99%)	103 (22.25%)	221(47.73%)	62 (13.39%)	40 (8.64%)

4. Summary and Discussions

Health supplements were reported to be used mostly by the younger age group (21-30 years). This finding matches with a finding of another study where the majority of young adults (25–34 years) reported using supplements while lowest use was reported by people aged ≥ 60 years. (12) This is further substantiated by the evidence wherein it was found that College-going students were more likely to use health supplements than the rest of the population. (13) Health, fitness and beauty conscious tendency amongst the young adults may be attributed to increased use of health supplements in this range of age. Thus, it can be deduced that education materials relating to use of health supplements must be targeted to university and college students who can act as champions in promoting safe use of health supplements.

Oriens' products 54% (n=250) were perceived to be the most popular products. This could be probably due to the aggressive and strategic marketing scheme (pyramid) adopted by Oriens as reported by the Kuensel Corporation Limited. (14) Listing certificates issued by the Drug Regulatory Authority for some health supplements were reportedly misused for dissemination of promotional propagandas to gain competitive edge over other non-listed products. However, as per the internal records of the Drug Regulatory Authority, Oriens and MagneSSa products were not found widely in the market, thus confirming the fact that Oriens and MagneSSa products are predominantly distributed informally via pyramid and Ponzi scheme or informal trade. Therefore, regulation must aim at preventing aggressive marketing through such schemes.

Taking undue advantage of rapidly evolving social media usage, companies used social media platforms to reach their clients. Most respondents obtained their information on health supplements from friends and social media or the Internet. The DRA needs to target social media platforms and develop strategies to create awareness on health supplements.

Majority of the respondents were neutral in terms of satisfaction level of benefits, information, availability, and prices of health supplements. 58.31% (n=270) of the respondents were satisfied with the role played by the DRA in advocating on safety of health supplements (Table 3).

One-fifth of the users were influenced by health professionals 20.7% (n=30). This indicates that some health professionals were engaged in marketing health supplements by involving in the pyramid and similar schemes. The companies are probably targeting the health professionals as consumers are more likely to listen and believe the health professionals. There is a need to work with the Ministry of Health and Bhutan Medical and Health Council to prevent the involvement of health professionals and disseminate information related to risks of health supplements.

Health supplements were mostly obtained from marketing agents 43.4% (n=63), friends 36.6% (n=53), family members 14.5% (n=21), health professionals 12.4% (n=18). There were also reports of marketing agents visiting houses to sell health supplements. The marketing agents must be the target while regulating the sale of health supplements.

One-third of those who use health supplements were regular users while respondents reported using at least one health supplement regularly while more than one-fourth used at least once a week (Table 2).

An increased replacement of prescription medications with vitamin and mineral supplements as well as medicinal herbs were reported. (15) We found that 14.5% (n=21) of the users reported replacing prescription medications with health supplements while 28.3% (n=41) of the users also reported using health supplements concomitantly with other medicines. The medicines replaced by supplements included antihypertensives, antidepressants, analgesics, and antidiabetics. Williamson (16) argues that although there is limited evidence of supplement-drug interactions at the moment, the fact remains that such interactions could be serious and life threatening. In a systematic review conducted by Marik and Flemmer in 2012 (17), it was shown that with the possible exceptions of Vitamin D and omega-3 fatty acids, there was no evidence to support the widespread use of health supplements in western countries; on the contrary, they found that many

of these supplements may be harmful. There is a high possibility of adverse drug reactions due to concomitant use and medical complications arising from the discontinuation of medications. The regulatory strategies should strengthen pharmacovigilance and prescribers should be advised to educate the patients not to discontinue medications and discourage concomitant use of medications.

77.2% (n=112) of the users perceived that the health supplements they used were effective. This finding resonates with other findings where it was found that health supplements were believed to be useful in prevention of disease although use of health supplements in treatment of diseases is not ascertained. (18) However, in most instances, potential risk associated with use of health supplements such as food-drug interaction, drug-drug interaction and lower adherence to drug therapy due to self-medications are overlooked. (19) Contradictory to the perception of the respondents, there is limited evidence to demonstrate the efficacy of health supplements for disease prevention, management, or treatment in nutrient-replete populations. (20) It was found that health supplements resulted in an estimated 23,000 emergency room visits every year. (21) Numerous FDA-conducted GMP inspections found that the private specifications set by the manufacturers are often insufficient to ensure adequate quality of dietary ingredients and health supplements. (22) In addition, GMP inspection conducted by the Drug Regulatory Authority found that the efficacies of these products were chiefly based on anecdotal evidence over scientific evidence. Therefore, it prompts the befitting agencies to sensitize the general public on the use of health supplements and caution the risk-benefit associated with it.

Many people who take health supplements take them before seeking any medical advice. (23) Only 18.6% of the users reported consulting health professionals prior to use of health supplements. The products were believed to be natural, effective, and safe without any side effects and certified by international companies. Reports indicated that almost 50% of users and non-users mistakenly believed that health supplements are approved for safety and efficacy before being marketed.

5. Limitations/ challenges

The survey was conducted using an untested questionnaire to assess the situation of health supplements at a time when Pyramid and Ponzi schemes were reportedly rampant in the country. The sample size was not representative of the population and respondents were selected randomly leading to unequal distribution of gender, age and education level of respondents.

Two different methods were used to collect the data, sharing the survey questionnaire in popular social media platforms through Google-Form and conducting face-to-face interviews. The surveys were conducted mostly in the towns and this has missed out the proper representation of the illiterate rural population.

6. Recommendations

Strategies to educate the public on the risk and benefits of health supplements need to be developed and implemented. Targeted interventions to younger groups and health professionals need to be prioritized as these cohorts of the population were found to be most influential in using or promoting the use of health supplements. Further studies with a representative sample to assess the prevalence, expenditure, adverse drug reactions, pre-existing health conditions of the users, specific types used etc. are required to have a more comprehensive idea on this issue.

7. Conclusion

The findings of this study concur with other studies - most people believe that health supplements are safe and effective; most of the users are in the younger age group; users take health supplements without the advice of the health professionals and use is driven by aggressive marketing strategies. Therefore, regulation of health supplements must aim at demystifying the wrong beliefs and create awareness on the health risks with support of the health professionals targeting the young population through social media platforms. Further study needs to be done to understand the types of health supplements and their consumption trends to adopt a risk-based regulatory approach.

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Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

Ethical Considerations

Administrative clearance and ethical approval was obtained from the REBH, Ministry of Health vide letter no. REBH/Approval/2020/003 dated 12 February 2020.

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