

PRESCRIPTION PATTERN OF NUTRACEUTICALS IN PATIENTS VISITING A TERTIARY CARE HOSPITAL, KATHMANDU, NEPAL

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ABSTRACT

Objectives: This study aims to provide a comprehensive analysis of the prescription pattern of nutraceuticals in patients visiting a tertiary care hospital in Kathmandu which includes identification of commonly prescribed nutraceuticals, analysis of co-prescribed drug classes, identification of major nutraceutical compositions, analysis of patient expenditure on nutraceuticals, and quantification of nutraceutical availability.

Methods: A purposive sampling method was used to conduct a descriptive cross-sectional study involving 304 patients from the outpatient departments of a tertiary care hospital, Nepal. Data on patients' sociodemographic characteristics, co-prescribed drugs, nutraceutical details, and supplement expenses were collected using a structured questionnaire and form. Patient cards provided the necessary information, which was then analyzed with SPSS-16 and Microsoft Excel.

Results: Out of 304 prescriptions analyzed, 64% were prescribed to females and 26% to patients aged 31–45 years. The general medicine department accounted for 44% of nutraceutical prescriptions, with multivitamins being the most common (91%). Tablets were the preferred dosage form 56%, and gastrointestinal disorder medicine was commonly co-prescribed with nutraceuticals. Nutraceuticals alone accounted for approximately 52% of the total medicine cost.

Conclusion: Nutraceuticals are being continuously used in the treatment of various diseases. The future of nutraceuticals is bright and can transform health care. More studies need to be taken up on the prescription of nutraceuticals in health care.

Keywords: Prescribing pattern, Nutraceuticals, Dietary supplements, Functional food.

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INTRODUCTION

Nutraceuticals are growing in interest among individuals all over the world. Although people have used functional foods since the Ayurvedic era, the word "Nutraceutical" is relatively new. Dr. Stephan Detelice (founder and chairman of the Foundation for Innovation in Medicine) coined the term nutraceuticals from the words "Nutrition" and "Pharmaceutical," thus can be defined as food or part of food that provides medical or health benefits, including the prevention and/or treatment of diseases. The meaning was later modified by the Health Ministry of Canada, which defines nutraceutical as a product isolated or purified from food, generally sold in medicinal form not usually associated with food, and demonstrated to have a physiological benefit or provide protection against chronic disease [1].

Nutraceuticals are natural bioactive supplements that offer nutritional benefits and potential treatments for various ailments. They include functional foods, medical foods, and dietary supplements like botanicals. These specifically formulated foods are rich in vitamins, minerals, proteins, and other nutrients to improve health and reduce the risk of chronic diseases [2]. They are also known as functional foods, delivering health benefits beyond basic nourishment, according to the International Food Information Council. A special class of therapeutic agents known as medical foods or medicinal foods is taken into consideration for the nutritional treatment of a certain ailment. For instance, medicinal foods are intended to treat cancer, hyperhomocysteinemia, pancreatic exocrine insufficiency, inflammatory disorders, and other ailments. They also significantly contribute to the prevention of several age-related or chronic disorders [3,4].

Nutraceuticals contain bioactive compounds that support bodily functions, address nutrient deficiencies, and complement traditional

treatments with fewer side effects. They offer personalized health-care options and contribute to research, innovation, and economic growth. Benefits include improved nutrition, extended lifespan, prevention of medical issues, and perceived naturalness with fewer side effects compared to conventional medication [5,6]. Price Waterhouse Copper says that the increase in growth in sales of vitamins and dietary supplements in the global market was 6.3% (2014–2018) and the market size was valued at USD \$382.51 billion in 2019 and is expected to expand by 8.3% (2016–2027), whereas the global pharmaceutical market was valued at USD \$324.42 billion in 2019 and is expected to expand by 13.74% from 2020 to 2027. Despite the huge market for the nutraceutical sector, these products are not strictly regulated [7,8].

While the upfront cost of nutraceuticals may seem higher, their emphasis on preventive measures and long-term health benefits may prove to be cost-effective by preventing disease progression and reducing the need for more expensive interventions and hospitalizations [9]. However, further research and studies are necessary to comprehensively assess the economic impact and cost-effectiveness of nutraceutical interventions in various healthcare settings. It is advisable for individuals to consult health-care professionals, explore insurance coverage options, and weigh the potential long-term benefits and savings when considering the cost of nutraceuticals [10].

METHODS

A descriptive cross-sectional study was carried out in a tertiary care hospital in Kathmandu, Nepal, attending the outpatient department (OPD). All age groups of patients were included who were interested in giving information related to this research. A total of 304 patients are involved in this research. Data on patients' sociodemographic

characteristics, co-prescribed drugs, nutraceutical details, and supplement expenses were collected using a structured questionnaire and form. Patient cards provided the necessary information, which was then analyzed with SPSS-16 and Microsoft Excel.

RESULT AND DISCUSSION

Demographic details

The consumption pattern of nutraceuticals in developing countries like Nepal is influenced by a variety of factors. These include economic status, level of literacy, occupation, access to primary healthcare, and religious and cultural practices. These factors may include low socioeconomic status, nutritional deficiencies, and limited access to health-care facilities. Table 1 shows the demographic details of the study.

As depicted in Table 1, 36% (n=108) of male patients received prescriptions that contained nutraceuticals of one or more types. However, 64% (n=196) of female patients received prescriptions that contained nutraceuticals. The maximum number of patients getting nutraceuticals was in the age range of 31–45 years and was 26% (n=78), followed by 25% (n=76) patients in the 46–60-year-old category and 22% (n=67) patients in the 61–75-year-old category. The maximum number of patients, 68% (n=207) consuming nutraceuticals were Hindu, followed by Buddhist (16%, n=49); similarly, maximum number 48% (n=145) of the patients prescribed nutraceutical were housewives, whereas patients involved in any type of service covered 27% (n=82), followed by business (13%). The study is slightly different than the similar study carried by Shrestha R., Shrestha S. et al (2021) Where nutraceutical prescribed male was 47.25% and Female were 52.75%. but the result was found to be similar with maximum number of patients getting nutraceutical were of age group 30-44 in same study [7].

Prescription pattern of nutraceuticals

As depicted in Table 2, the prescribing patterns of nutraceuticals were maximum in the general medicine department (44%, n=135), followed by the orthopedics department (36%, n=109) and the gynecology and obstetrics departments. Also prescribed

Table 1: Sociodemographic characteristics

Demographic details	Percentage	Frequency (n=304)
Sex/gender		
Male	36	108
Female	64	196
Age group		
<15	2	5
16–30	16	50
31–45	26	78
46–60	25	76
61–75	22	67
>75	9	28
Religion		
Hindu	68	207
Buddhist	16	49
Christian	10	30
Others	6	18
Literate level		
Illiterate	42	128
Secondary	25	76
Higher secondary and above	22	66
Primary	6	18
Just read and write	5	16
Marital status		
Married	87	264
Unmarried	13	40
Occupation		
Housewife	48	145
Service	27	82
Business	13	41
Others	12	36

nutraceuticals were in the combination form of pre/probiotics and/or vitamins and/or minerals and/or enzymes and/or proteins and/or herbs. Among the prescribed nutraceuticals, vitamins were in maximum of them occupying 91% (n=278) of the nutraceuticals, followed by minerals (82%, n=248), pre/probiotics (12%, n=36), enzymes (20%), herbals (11%), and proteins (11%). According to a study carried in a tertiary care hospital in Pakistan by Nasri et al., it was found that medicine department prescribed nutraceuticals most and accounts to 30%, followed by surgery and gynecology department and accounts to 16.3% each [3].

Dosage form of nutraceutical prescribed

Table 3 shows the different dosage forms of nutraceuticals prescribed to patients visiting OPD. Among the various dosage forms, tablets were prescribed the most, occupying 56% (n=170), followed by capsules at 45% (n=136), whereas liquid and injection dosage forms were not prescribed at all. A similar Study conducted by Ragesh et al. in a hospital in India show that the tablets were the most prescribed dosage form followed by powder and injection respectively [2].

Category of medicine co-prescribed with nutraceuticals

Different types of medicines are generally co-prescribed with nutraceuticals. Table 4 showed that the maximum number of drugs that were prescribed with nutraceuticals were drugs used in GI disorders at 70% (n=213), which was followed by drugs used in musculoskeletal and joint disorders, which accounted for 38.49% (n=117). Similarly, drugs used in endocrine disorders were 25.33% (n=77), followed by vitamins and minerals, and drugs used in infections were 17.76% (n=54).

Table 2: Prescribing pattern of nutraceutical

Prescribing Pattern	Percentage	Frequency
Departments		
General medicine	44	135
Orthopedics	36	109
Surgical	8	24
Gynecology and obstetrics	8	24
Others	4	12
Category of nutraceuticals		
Vitamins	91	278
Minerals	82	248
Enzymes	20	61
Pre/probiotics	12	36
Proteins	11	33
Herbals	11	33

Table 3: Dosage form of nutraceuticals prescribed

Dosage form	Percentage	Frequency
Tablet	56	170
Capsule	45	136
Powder/sachet	2	6
liquid	0	0
Injection	0	0

Table 4: Category of medicines co-prescribed with nutraceutical

Category of drugs co-prescribed	Percentage	Frequency
GI disorders	70.07	213
Musculoskeletal and joint disorders	38.49	117
Endocrine disorders	25.33	77
Blood disorders	17.76	54
Vitamins and minerals	17.76	54
infections	17.76	54
Respiratory disorders	12.83	39
Neurological and psychiatric disorder	11.84	36
Cardiovascular disorder	8.88	27
Others	8.22	25

Table 5: Major composition of nutraceuticals prescribed

Constituents	Frequency	Percentage
Zinc	177	58
Vitamin D3/cholecalciferol	170	56
Vitamin B12	160	53
Calcium	153	50
Folic acid	118	39
Vitamin B6/pyridoxine	121	40
Vitamin C	93	31
Vitamin E	89	29
Vitamin B2	79	26
Vitamin B1	69	23
Vitamin K2-7	71	23
Ferrous fumarate	60	24
Vitamin A	56	22
Potassium	54	22
Manganese	54	22
Vitamin B3/niacinamide	52	21
Copper	52	21
Vitamin B5	51	20
Magnesium	49	20
Ginseng extract powder	35	14
Streptococcus faecalis	35	14
Lactobacillus acidophilus	35	14
Clostridium butyrium	35	14
Phosphorous	32	13
Iodine	31	12
Chromium	25	10
Omega-3,6,9	22	9
Biotin	18	7
Glucosamine sulfate	12	5
Co-enzyme Q10	12	5
DHA	10	4
Collagen peptide type 2	9	4
Chondroitin sulfate	9	4
Amino acid	9	4
Alpha linolic acid	8	3
Lycopene	8	3
Sodium hyaluronate	7	3

Table 6: Comparing costs of prescribed nutraceuticals on various departments

Departments	Average cost of nutraceuticals in USD	Average cost of nutraceuticals in NRs
Surgical	9.535526	1238.38
Gynecology and obstetrics	9.4248	1224
Orthopedics	8.819503	1145.39
Others	8.778	1140
General medicine	6.841296	888.48

Major composition of nutraceuticals prescribed

Nutraceuticals as a marketed formulation consist of more than one chemical composition. A list of the major chemical compositions of nutraceuticals prescribed is shown in Table 5. Among the various compounds, the maximum number of nutraceuticals consists of zinc at 58.8% (n=177), followed by vitamin D3/cholecalciferol at 56% (n=170) and vitamin B12 at 53% (n=160). Calcium was present in 50% of the total nutraceuticals prescribed, and similarly, vitamin B6 was present in 40% of the total prescribed nutraceuticals.

Comparing cost of prescribed nutraceutical

In this study, patients spent an average of NRs. 1017.884 (7.83 USD) per nutraceutical prescription, with the highest cost in orthopedics that amounts to NRs. 5040 (38.80 USD) and the lowest in general medicine OPD that amounts to NRs. 64 (0.49 USD) only. The cost of nutraceuticals varied significantly among different OPDs. As Shown in Table 6, the average cost of total medicine per prescription was NRs. 1950.36 (15.01

USD) with the highest of NRs. 5325 (41.00 USD) in orthopedics OPD. It was found that 52.18% of the total cost of a prescription was consumed by nutraceuticals of one or many types. The similar study was carried by Shrestha R., Shrestha S. et al which showed that the average amount that a patient spent on nutraceutical was 4.43 only which is almost half the amount by our study [7].

CONCLUSION

In summary, the overwhelming majority of patients who were prescribed nutraceuticals were female. Among the different departments in the health-care facility, the general medicine department had the highest number of patients who were prescribed nutraceuticals. When it came to specific categories of nutraceuticals, vitamins were the most commonly prescribed, closely followed by drugs used in gastrointestinal disorders.

Interestingly, a significant trend emerged regarding the inclusion of zinc in the prescribed nutraceuticals. It was found that a majority of the prescribed nutraceuticals contained zinc, indicating its potential importance in patient treatment plans. In addition, it was observed that the average cost incurred on nutraceuticals was higher in the surgical department compared to other departments.

A notable finding was that nutraceuticals accounted for more than half of the total prescription cost, emphasizing their significant role in patient health-care expenditure. This indicates the increasing popularity of nutraceuticals as they are increasingly integrated into treatment strategies. Patients and health-care professionals recognize the perceived health benefits offered by nutraceuticals and their potential.

Recommendations

This study suggests the need for the development and implementation of regulations and guidelines for the prescription of nutraceuticals. Nutraceuticals should be regulated by the DDA, and their quality, efficacy, and safety must be checked, as they are prescribed with medicines and occupy half of the cost of treatment or medicines.

AUTHORS CONTRIBUTION

The study design and conception were equally contributed to by the author and coauthor. Pharsuram Adhikari and Amod Kumar Yadav were responsible for material preparation, data collection, analysis, result interpretation, and manuscript drafting. The final manuscript has been read and approved by both the author and coauthor.

CONFLICT OF INTEREST

The author(s) assert that there are no potential conflicts of interest regarding the research, authorship, and publication of this article. The authors are committed to keeping things transparent and upholding ethical standards in how they conduct and share their research.

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