PARENTAL NUTRITION KNOWLEDGE, ATTITUDE AND PRACTICE AND THEIR ASSOCIATIONS WITH CHILDREN'S NUTRITIONAL SUPPLEMENTS INTAKE.

MUHAMAD ZAI MIRZA BIN ZAINI

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Supervisor's Signature

The project entitled "Parental nutrition knowledge, attitude and practice and their associations with children's nutritional supplements intake" was prepared by Muhamad Zai Mirza bin Zaini and submitted to Faculty of Medicine and Health Sciences as a partial fulfilment of the requirement for the Master in Nutritional Science from the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

Received and examined by:

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(Assoc. Prof. Dr Geeta Appannah)

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ABSTRACT

PARENTAL NUTRITION KNOWLEDGE, ATTITUDE AND PRACTICE AND THEIR ASSOCIATIONS WITH CHILDREN'S NUTRITIONAL SUPPLEMENTS INTAKE

Muhamad Zai Mirza Bin Zaini

The prevalence of nutritional supplement (NS) use in children is increasing globally, driven by factors such as parental concerns about dietary deficiencies, the influence of marketing, and the desire to boost immunity and support growth. The objective of this study was to determine the parental nutrition knowledge, attitudes, and practice (NKAP) on the nutritional supplement intake in their children in Malaysia. The study also assessed the socioeconomic status (SES) of the parents and children's dietary habits. The study involved 126 parents of children aged 2-12 years old from Malaysia. An online self-administered questionnaire was used to collect data on parental NKAP, SES, children's dietary habits, and NS use. The study found that 66% of the children were taking at least one type of NS for the past three months. The most used NS were Vitamin C (45.8%) and multivitamin/multimineral (41.0%). The mean NKAP score was 41.0 (SD 3.8) (maximum score 57), which was considered moderate. The mean frequency intake of fruits, vegetables, and snacks among children were 0.89, 1.02, and 0.66 serving per day, respectively. The logistic regression analysis showed that gender was the only factor significantly associated with NS use (OR 2.73, 95% CI 1.17, 6.35, p=0.020) whereby female were 2.73 times more likely to give supplements to their children as compared to the male.

The study concludes that the prevalence of NS use in Malaysian children is high, aligning with global trends and previous findings in Malaysia. The popularity of Vitamin C and multivitamins reflects a focus on immunity and overall well-being. The moderate mean NKAP score suggests that while parents possess decent nutritional knowledge, there's room for improvement in translating this knowledge into practice. The low intake of fruits and vegetables among children, despite their parents' moderate NKAP scores, underscores the challenges in promoting healthy dietary habits. The significant association between female gender and increased likelihood of giving supplements to children highlights the influential role of mothers in shaping children's health behaviors. The study recommends further research to explore the reasons for NS use among Malaysian children, including parental beliefs andattitudes, sources of information, and perceived benefits and risks. Additionally, investigating the actual impact of NS use on children's health and nutritional status, as well as potential interactions with dietary intake and other medications, is crucial. The study alsoemphasizes the need for targeted interventions that bridge the gap between parental NKAP and children's dietary practices, promoting healthy eating habits and reducing inappropriate supplement intake. Addressing the gendered nature of supplement intake decisions and exploringthe broader sociocultural context of child nutrition can inform the development of effectiveand culturally relevant interventions. By addressing these research gaps and implementingevidence-based interventions, we can work towards creating a healthier future for Malaysianchildren.

ABSTRAK

KAJIAN TENTANG PENGETAHUAN, SIKAP DAN AMALAN PEMAKANANIBU BAPA TERHADAP PENGGUNAAN SUPLEMEN PEMAKANAN DALAMKALANGAN ANAK- ANAK MEREKA DI MALAYSIA

Muhamad Zai Mirza Bin Zaini

Penggunaan suplemen pemakanan dalam kalangan kanak-kanak semakin meningkat di seluruh dunia, didorong oleh faktor-faktor seperti kebimbangan ibu bapa tentang kekurangan diet, pengaruh pemasaran, dan keinginan untuk meningkatkan imuniti dan menyokong pertumbuhan. Objektif kajian ini adalah untuk menentukan pengetahuan, sikap, dan amalan pemakanan ibu bapa terhadap pengambilan suplemen pemakanan pada anak-anak mereka di Malaysia. Kajian ini juga menilai status sosioekonomi ibu bapa dan tabiat pemakanan kanak-kanak. Kajian ini melibatkan 126 ibu bapa yang mempunyai anak berumur 2-12 tahun dari Malaysia. Soal selidik dalam talian telah digunakan untuk mengumpul data tentang pengetahuan, sikap, dan amalan pemakanan ibu bapa, status sosioekonomi, tabiat pemakanan kanak-kanak, dan penggunaan suplemen pemakanan. Kajian ini mendapati bahawa 66% kanak-kanak mengambil sekurang-kurangnya satu jenis suplemen pemakanan sejak tiga bulan lepas. Suplemen pemakanan yang paling banyak digunakan ialah Vitamin C (45.8%) dan multivitamin/multimineral (41.0%). Skor min pengetahuan, sikap, dan amalan pemakanan ibu bapa adalah 41.0 (SD 3.8) (skor maksimum 57), yang dianggap sederhana. Purata kekerapan pengambilan buah-buahan, sayur-sayuran, dan snek dalam kalangan kanak-kanak adalah masing-masing 0.89, 1.02, dan 0.66 hidangan sehari. Analisis regresi logistik menunjukkan bahawa jantina adalah satu-satunya faktor yang dikaitkan secara signifikan dengan penggunaan suplemen pemakanan (OR 2.73, 95% CI 1.17, 6.35,

p=0.020) di mana wanita adalah 2.73 kali lebih cenderung untuk memberi suplemen pemakanan kepada anak mereka berbanding lelaki. Kajian ini menyimpulkan bahawa kelaziman penggunaan suplemen pemakanan dalam kalangan kanak-kanak Malaysia adalah tinggi, selaras dengan trend global dan penemuan sebelumnya di Malaysia. Popularity Vitamin C dan multivitamin mencerminkan tumpuan kepada imuniti dan kesejahteraan keseluruhan. Skor min pengetahuan, sikap, dan amalan pemakanan ibu bapa yang sederhana menunjukkan bahawa walaupun ibu bapa mempunyai pengetahuan nutrisi yang baik, terdapat ruang untuk penambahbaikan dalam menterjemahkan pengetahuan ini kepada amalan. Pengambilan buah-buahan dan sayur-sayuran yang rendah dalam kalangan kanak-kanak, walaupun skor pengetahuan, sikap, dan amalan pemakanan ibu bapa ibu bapa mereka sederhana, menekankan cabaran dalam mempromosikan tabiat pemakanan yang sihat.. Kajian ini mengesyorkan penyelidikan lanjut untuk meneroka faktor lain penggunaan suplemen pemakanan dalam kalangan kanak-kanak Malaysia, termasuk kepercayaan dan sikap ibu bapa, sumber maklumat, dan manfaat sertarisiko yang dirasakan. Selain itu, adalah penting untuk menyiasat kesan sebenar penggunaansuplemen pemakanan terhadap kesihatan dan status pemakanan kanak-kanak, serta potensi interaksi dengan pengambilan makanan dan ubat-ubatan. Kajian ini juga menekankan keperluan untuk intervensi yang disasarkan yang merapatkan jurang antara pengetahuan, sikap, dan amalan pemakanan ibu bapa dan amalan pemakanan kanak-kanak, mempromosikan tabiat pemakanan yang sihat dan mengurangkan penggunaan suplemen pemakanan yang tidak sesuai. Memahami sifat keputusan penggunaan suplemen pemakanan berdasarkan jantina dan meneroka konteks sosiobudaya yang lebih luas tentang pemakanan kanak-kanak boleh memberi maklumat untuk pembangunan intervensi yang berkesan. Dengan menangani jurang penyelidikan ini dan melaksanakan intervensi berasaskan bukti, kita boleh berusaha ke arah mewujudkan masa depan yang lebih sihat untuk kanak-kanak Malaysia.

CHAPTER 1

INTRODUCTION

1.1 Background

According to Ministry of Health Malaysia, supplement can be categorized into food supplement and health supplement. Both types are regulated under different agency, for food supplement Food Safety and Quality Division (FSQD) is responsible for the regulation, while health supplement are regulated under National Pharmaceutical Regulation Agency (NPRA). NPRA defines health supplement as a product that can be used to supplement a diet while also maintaining, enhancing, and improving the health functions of the human body. It can be presented in tiny unit dose forms (to be delivered), such as capsules, pills, powders, and liquids, but it must not contain any sterile preparations, such as injectables or eyedrops (Drug Registration Guidance Document, 2022). While FSQD defines anything that is more than 80% food ingredient as food products, thus products such as honey, herbal product, alfafa, pegaga tablets are all classified under food thus categorised as food supplement (Fadhilah et al., 2020).

In this study, the term nutritional supplement (NS) was used to refer as the products defined by NPRA, as health supplement. They include vitamins, minerals, and other less familiar substances, as amino acids, and enzymes. They often contain 100% or more of the daily need of one or more nutrients (Mishra et al., 2020). However, supplements should not replace the varietyof foods that are important to a healthful diet unless it was clinically diagnosed

and recommended usage by doctors or registered nutritionist and dietitian. Unlike drugs, supplements are not intended to treat, diagnose, prevent, or cure diseases (Thakkar et al., 2020). They are also used to complement the diet of people who are at elevated risk of deficiency or who have morbid diseases that limit their bioavailability. They comprise single or mixed macro and micronutrients, bioactive compounds, enzymes, and probiotics (Barretto et al., 2024).

Many supplements contain active ingredients that have strong biological effects in the body. Nutritional supplements are more likely to cause negative effects if taken in large dosages, instead of prescribed medications, or with a variety of other supplements. Some studies have shown the potential toxicity of supplement in children, a review in highlighted the dangers of accidental iron overdose in young children, leading to serious health complications and even death. A study on Vitamin D also examined the association between high doses of vitamin D supplements and hypercalcemia (elevated calcium levels) in infants (Vogiatzi et al., 2014). Supplements can also interact with some medications, potentially causing issues. For example, vitamin K can impair warfarin's effectiveness to prevent blood clots (Linkins, 2013). This could make them unsafe in some situations and hurt or complicate health.

Additionally, while supplements can be beneficial in supporting overall health andaddressing specific nutrient deficiencies, it is essential to be aware of their potential risks. Taking excessive dosages, combining multiple supplements, or using them without medical guidance can lead to unintended and potentially severe consequences. To ensure safe and effective supplement intake, it is advisable to consult with a healthcare

professional who can assess individual needs, recommend appropriate dosages, and monitor for any adverse effects. Additionally, choosing reputable brands, following label instructions, and reporting any unusual symptoms to a doctor are crucial steps in minimizing the risks associated with supplement intake.

There are several compelling reasons to investigate the prevalence and use of nutritional supplements in Malaysia. The high prevalence of obesity, diabetes, and other chronic diseases in Malaysia raises concerns about the nutritional status of the population (C. T. Chong et al., 2023). Understanding the use of supplements can shed light on potential gaps in dietary intake and inform public health interventions. Even dietary supplement market in Malaysia is regulated, the lack of enforcement often leads to concerns about product quality, safety, and efficacy. Research can help identify potential risks and inform regulatory policies. Modern lifestyles and dietary changes and nutrition transition may lead to nutrient deficiencies or imbalances (Pingali et al., 2019). Studying supplement intake can help assess whether supplements are being used appropriately to address these issues.

Understanding the reason people use supplements, their sources of information, and their beliefs about efficacy can help tailor educational campaigns and improve consumer awareness (Sirico et al., 2018). The supplement industry is a significant contributor to the Malaysian economy. Research can provide insights into market trends, consumer preferences, and potential areas for growth. Many supplements can interact with medications, and this is a particular concern in Malaysia due to the high prevalence of chronic disease and polypharmacy (Lim et al., 2017). Research can help identify potential risks and educate both consumers and healthcare providers. Certain nutrient deficiencies, such as vitamin D

deficiency, are prevalent in Malaysia due to limited sun exposure and dietary habits (Isa et al., 2022). Studying supplement intake can help assess whether supplementation is effectively addressing these deficiencies.

The growing popularity of sports and fitness in Malaysia has led to increased interest in supplements for performance enhancement and recovery (Latif et al., 2021). Research can help evaluate the safety and effectiveness of these products. By conducting research on the prevalence and use of nutritional supplements in Malaysia, policymakers, healthcare providers, and consumers can make informed decisions about their use, ensuring that supplements are used safely and effectively to promote health and well-being.

Research on the prevalence and use of nutritional supplements in Malaysia can help address this consumer misconception by providing evidence-based information about the safety and efficacy of these products. By understanding how consumers perceive and use NS, policymakers and healthcare providers can develop targeted educational campaigns and regulatory measures to ensure that consumers make informed decisions about their use. This can ultimately contribute to the safe and effective use of NS for promoting health and well-being in Malaysia.

Understanding the prevalence and use of NS in Malaysia is particularly important considering the growing evidence that family environments influence children's eating habits and weight status (Rathuan et al., 2020). Parents play a key role in shaping their children's nutritional intake, including the use of supplements (Arora et al., 2021). Research can provide insights into parental perceptions and practices regarding NS, informing

strategies to encourage healthy eating habits in children. For instance, if research shows a trend of parents over-supplementing their children's diets due to misconceptions, targeted educational campaigns could focus on clarifying the appropriate use of NS and emphasizing the importance of a balanced diet.

Additionally, understanding parental feeding patterns can reveal the extent to which NS are used in conjunction with other food-related strategies, such as restricting unhealthy snacks. This information could guide the development of comprehensive interventions that address both dietary patterns and NS use, promoting a holistic approach to children's health and well-being in Malaysia. Furthermore, comprehending parental feeding patterns can shed light on how frequently NS are employed alongside other food-related strategies, such as limiting access to unhealthy snacks. This insight is invaluable for crafting holistic interventions that simultaneously address both dietary patterns and the utilization of NS, fostering a comprehensive approach to children's health and well-being in Malaysia.

By understanding the interplay between NS and other feeding practices, healthcare professionals and policymakers can develop nuanced interventions that not only target the reduction of NS but also encourage the adoption of healthier dietary habits in Malaysian families. Such comprehensive programs could empower parents to make informed choices about their children's nutrition, fostering a positive food environment that supports long- term health and well-being. In addition to empowering parents, these programs can also play a vital role in educating children about healthy eating habits from a young age.

By incorporating interactive and engaging activities that promote nutritious food choices and discourage the reliance on NS, these interventions can instill lifelong healthy behaviors in the next generation.

Furthermore, integrating these programs within the broader healthcare system and educational institutions in Malaysia can ensure their accessibility and sustainability. Collaboration between healthcare professionals, educators, and policymakers is essential for creating a supportive network that reinforces healthy messages and empowers families to make positive changes.

Ultimately, by addressing the complex interplay between NS, parental feeding practices, and cultural influences, Malaysia has the opportunity to implement innovative and effective strategies that not only combat childhood obesity but also nurture a generation of health-conscious individuals. These efforts will undoubtedly contribute to a healthier and happier future for Malaysian children and their families.

Moreover, acknowledging the influence of cultural and socio-economic factors on parental feeding practices in Malaysia is crucial for tailoring interventions that resonate with the diverse population. This culturally sensitive approach enhances the effectiveness of interventions and promotes their widespread adoption, ultimately contributing to the reduction of childhood obesity and its associated health risks. A growing body of evidence suggests that the family environment plays a significant role in shaping children's eating habits and weight status. This includes factors such as parental feeding practices, dietary patterns within the household, and the availability and accessibility of healthy food options (Mahmood et al., 2021; Scaglioni et al., 2018a).

Parental feeding practices, such as restrictive feeding or pressure to eat, have been associated with increased risk of childhood obesity and disordered eating behaviors (Hazzard et al., 2020). On the other hand, responsive feeding practices, which involve providing a variety of healthy foods and allowing children to self-regulate their intake, are linked to healthier eating habits and weight outcomes. The dietary patterns within the household also play a crucial role (Tang et al., 2020). Children who grow up in environments where healthy foods are readily available and regularly consumed are more likely to develop healthy eating habits themselves. Conversely, households with limited access to healthy foods or where unhealthy snacks and processed foods are prevalent may contribute to unhealthy eating patterns in children.

The availability and accessibility of healthy food options within the family environment are also important (Haines et al., 2019). This includes having healthy snacks readily available, preparing meals at home using fresh ingredients, and limiting the consumption of fast food and sugary drinks. Creating a supportive and encouraging environment for healthy eating can have a lasting impact on children's food choices and overall health. Food-related parenting strategies, such as encouraging children to consume nutrition supplements while restricting palatable snack food intake such as high fat and high sugar content food and drinks have also been found as potentially major drivers of children's eating pattern and weight status (Scaglioni et al., 2018b). One review critically summarized prior studies on parental feeding patterns and concluded that parental role models can have a significant impact in shaping children's eating habits (Mahmood et al., 2021).

Numerous studies have investigated the relationship between nutritional supplement (NS) use and lifestyle factors, revealing intriguing associations. A consistent finding across various surveys and studies is that individuals who use NS are more likely to engage in several positive health-related behaviors. NS users tend to have healthier dietary patterns compared to non-users. This includes consuming more fruits, vegetables, and whole grains, while limiting their intake of processed foods, sugary drinks, and unhealthy fats.

A study of users in three European countries supports this observation, highlighting the positive association between NS use and adherence to a healthy dietary pattern (Iłowiecka et al., 2022a). Additionally, individuals who use NS are also more likely to engage in regular physical activity. Exercise is known to have numerous health benefits, including weight management, cardiovascular health, and improved mental well-being. Studies have shown a significant correlation between NS use and increased physical activity levels, suggesting that NS users may be more conscious of their overall health and wellness (Alowais & Selim, 2019; Iłowiecka et al., 2022a).

While these studies highlight the positive association between NS use and various health- related behaviors, it is important to consider that correlation does not necessarily imply causation. It is possible that individuals who are already inclined towards a healthy lifestyle are more likely to use NS, rather than NS use directly causing healthier habits. However, these findings still suggest that NS users may represent a health-conscious population segment who actively seek ways to improve their overall health and well- being.

Thus, this study will be focusing on parental nutrition knowledge, attitudes, and practices (NKAP) on NS and the intake of NS on their children. The rationale for studying parental nutrition Knowledge, Attitudes, and Practices (KAP) is rooted in the understanding that parents play a pivotal role in shaping their children's development and well-being, particularly in areas particularly health and nutrition. Understanding parental KAP provides valuable insights that can inform interventions, policies, and programs aimed at improving child health outcomes.

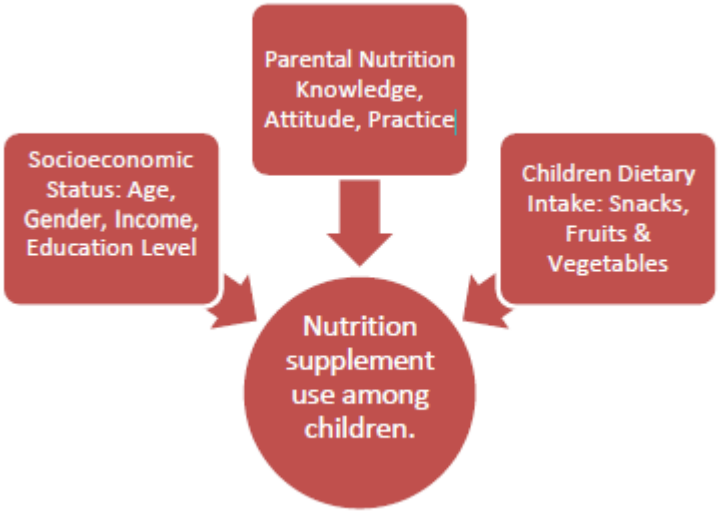
Assessing parental knowledge helps identify misconceptions or gaps in understanding about child health, nutrition, and development. This information can be used to develop targeted educational programs to empower parents with accurate and up-to-date information. Parental attitudes and beliefs significantly influence their behaviors and choices related to their children's health. By understanding these attitudes, interventions can be designed to address potential barriers and promote positive health behaviors. Examining parental practices provides insights into the actual behaviors' parents engage in regarding their children's health. This information can help identify effective practices that should be encouraged and harmful practices that need to be modified.

Studies in KAP can also provide evidence-based data to inform the development of effective interventions, policies, and programs. These initiatives can be tailored to address the specific needs and challenges identified in the target population. KAP studies can also be used to evaluate the effectiveness of existing interventions and programs. By assessing changes in KAP over time, researchers can determine the impact of these initiatives and identify areas for improvement.

Thus, with the gap of data on the prevalence and use of NS and parental nutrition knowledge, attitudes, and practices (NKAP) on NS in Malaysia, thus raise a need to conduct research on parental nutrition knowledge, attitudes, and practice (NKAP). The current study fills this literature gap by evaluating the parental healthy eating attitudes and nutritional knowledge on the nutritional supplement intake in their children in Malaysia.

1.2 Conceptual Framework

Figure 1.0 Conceptual Framework



The conceptual framework presented in figure 1.0 shows that nutrition supplement intake among children is influenced by a complex interplay of factors. Parental nutrition knowledge, attitudes, and practices are pivotal, suggesting that parental understanding and beliefs significantly impact supplement choices for their children. Socioeconomic factors, including age, gender, income and education level also play a role, potentially affecting access to and perceived need for supplements. Additionally, children's dietary intake, specifically their consumption of snacks, fruits, and vegetables, is likely to influence supplement intake. This framework highlights the complex nature of children's supplement intake and highlights the need for interventions that address parental education, socioeconomic disparities, and dietary habits to promote optimal nutrition in children.

1.3 Research Gap

Previous studies have revealed the importance of further research on the knowledge, attitudes, and practices (KAP) of parents regarding their child's nutritional supplement (NS) use. These studies have shown that parents often misunderstand the purpose and appropriate use of NS for their children and may seek information from unreliable or non-credible sources (Dorczok et al., 2024; Kang et al., 2015; Mohsen et al., 2022a). This can lead to suboptimal dietary choices, potentially decreasing the overall nutritional quality of a child's diet and overlooking the importance of obtaining essential nutrients from wholefoods.

This knowledge gap highlights the need for comprehensive research on parental nutrition KAP, specifically regarding NS use in children. The current study addresses this gap by evaluating parental healthy eating attitudes and nutritional knowledge in relation to their use of NS for their children in Malaysia. This research aims to provide valuable insights into the factors influencing parental decision-making around NS use, and ultimately contribute to the development of targeted interventions to improve child nutrition and health outcomes. Specifically, this study will explore the prevailing attitudes of Malaysian parents towards healthy eating and the use of NS for their children. It will also assess the level of nutritional knowledge among parents and identify the primary sources of information they rely on when making decisions about NS use for their children. The research will investigate potential associations between parental attitudes, knowledge, and practices regarding NS use, and examine the potential implications of these practices on the overall nutritional status and health outcomes of their children.

By addressing these aspects, this study contributed to a deeper understanding of the complex interplay between parental KAP and NS use in children. The findings of this study informed the development of evidence-based educational and intervention strategies to empower parents with the knowledge and skills necessary to make informed decisions about their child's nutrition, including the appropriate use of NS when necessary.

1.4 Objectives

General objective:

To determine the parental nutrition knowledge, attitudes, and practice on thenutritional supplement intake in their children in Malaysia.

Specific objectives:

1.4.1 To assess the SES factors such as education background and income level of the study respondents.

1.4.2 To assess the use of nutritional supplements amongchildren of the study respondents.

1.4.3 To assess parental nutrition knowledge, attitudes, and practice of the study respondents.

1.4.4 To analyze the fruit, vegetable, and snack intakes among children of the study respondents and the association on their nutritional supplement intake.

1.4.5 To determine associations between parental nutrition KAP, SES, dietary intake habits and children nutrition supplement intake among their children.

1.5 Research Questions

What is the level of nutritional supplement intake among children in this study?

What is the Malaysian parental nutrition knowledge, attitudes, and practice?

What is the parental SES status among study respondents in this study?

What are the dietary habits of children in this study?

How are parental nutrition knowledge, attitudes and practice, SES and children'sdietary habit associated with nutritional supplement intake in their children?

1.6 Hypotheses

H1: There is a significant relationship between parental nutrition knowledge, attitudes, practice, socioeconomic status (SES), and children's dietary habits and their children's intake of nutritional supplements.

H0: There is no significant relationship between parental nutrition knowledge, attitudes, practice, socioeconomic status (SES), and children's dietary habits and their children's intake of nutritional supplements.

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