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Sustainability and Food Systems Concepts in Dietetic Training Standards in Speaking Spanish Countries

Conceptos de Sostenibilidad y Sistemas Alimentarios en los Estándares de Formación Dietética en Países de Habla Hispana

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ABSTRACT

Introduction: Global calls for action to support sustainable development through food systems and nutrition provide context to examine to what degree nutrition and dietetics professionals are equipped for this challenge. The purpose of this research is to investigate content related to sustainable food systems in training standards from Spanish-speaking countries and examine what level of knowledge is required.

Methods: Researchers conducted a content analysis of documents informing nutrition and dietetics training standards for content related to sustainable food systems, including dimensions of these complex topics. Relevant content was then analyzed according to the level of cognitive complexity per Bloom's Revised Taxonomy.

Results: Of 21 eligible countries, documents describing competencies, standards or codes of ethics were found for six, four of which included relevant standards: Colombia, Mexico, Paraguay, and Peru. Overall, there was minimal comprehensive inclusion of sustainable food systems, but partial inclusion of one or more important sustainability dimensions. These were required at a mix of levels of cognitive complexity.

Conclusions: This research adds to a small body of evidence documenting the state of readiness of nutrition and dietetics professionals to contribute to sustainable development. It highlights a moderate level of readiness in four Spanish-speaking countries, and opportunities for increased emphasis on comprehensive sustainability-informed education and training standards, which can help prepare practitioners for effective practice.

Funding: MITACS Global Research Internship.

Keywords: Education, Professional; Dietetics; Sustainable Development; Sustainable Food System; Competency-Based Education; Professional Competence.

TiAb. Dietetics education; Dietetics standards.

RESUMEN

Introducción. Los llamados mundiales a la acción para apoyar el desarrollo sostenible a través de los sistemas alimentarios y la nutrición brindan un contexto para examinar el nivel de competencias de los profesionales de la nutrición y la dietética para este desafío. El objetivo de esta investigación es investigar contenidos relacionados con sistemas alimentarios sostenibles en planes de estudio universitarios en nutrición y dietética humana de países de habla hispana y examinar qué nivel de conocimiento se requiere.

Metodología. Se realizó análisis de contenido de documentos y planes de estudios universitarios en nutrición y dietética humana relacionados con sistemas alimentarios sostenibles, incluyendo las dimensiones estudiadas en estos temas complejos. El contenido relevante se analizó según el nivel de complejidad cognitiva según la Taxonomía Revisada de Bloom.

Resultados. De 21 países elegibles, se encontraron documentos que describen competencias, estándares o códigos de ética en seis, cuatro de los cuales incluían estándares relevantes: Colombia, México, Paraguay y Perú. En general, hubo una inclusión integral mínima de sistemas alimentarios sostenibles, pero una inclusión parcial de una o más dimensiones importantes de sostenibilidad. Estos fueron necesarios en una combinación de niveles de complejidad cognitiva.

Conclusión. Esta investigación se suma a un pequeño conjunto de evidencia que documenta el estado de preparación de los profesionales de la nutrición y la dietética para contribuir al desarrollo sostenible. Destaca un nivel moderado de preparación en cuatro países de habla hispana y oportunidades para un mayor énfasis en estándares integrales de educación y capacitación informados sobre la sostenibilidad, que pueden ayudar a preparar a los profesionales para una práctica eficaz.

Financiamiento: MITACS Global Research Internship.

Palabras clave. Educación Profesional; Dietética; Desarrollo Sostenible; Sistema Alimentario Sostenible; Educación Basada en Competencias.

TiAb. Educación profesional en nutrición; Estándares dietéticos.

HIGHLIGHTS

- Four Spanish-speaking nations include at least partial coverage of sustainable food systems dimensions in their dietetic training and practice standards: Colombia, Mexico, Paraguay and Peru. This is 66% of those for which standards exist, and similar to international content.
- Mexican and Peruvian standards require robust commitment to social and environmental sustainability in practice (values). Mexican education is guided by relatively low level of cognitive complexity (knowledge of, “understand”); Peruvian practice standards required a higher level (up to “create”).
- The standards in Paraguay and Colombia contribute to food systems sustainability competence through primarily food and nutrition security-related standards, concepts inseparable from sustainable food systems. Colombia explicitly recognizes the purview of nutritionists as throughout food systems (production to consumption).
- Opportunities exist for increasing the focus on food systems sustainability as a guiding paradigm for food and nutrition work, in the context of urgent global priorities to climate change and sustainable development.

INTRODUCTION

Sustainability is a complex of three fundamental and interconnected pillars: social, economic, and environmental, each of which is directly influenced by the other. It reflects the optimal conditions of the present where it is guaranteed that resources are not used at a rate greater than that which is available, that all people have equal access to such optimal conditions, and in ways that will not prevent such conditions in the future.

Unsustainable conditions create risks to the health (physical or emotional) of the population¹. For example, currently we use ecosystem resources and services at rates far exceeding what is known to be available and this negatively impacts our ability to produce food². Globally, our access to food is inequitable and exacerbated when community members are not involved in food systems decision-making and not empowered in relation to their health³. Sustainable food systems would ensure that *“food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition of future generations are not compromised”*⁴. In this definition, the United Nations High Level Panel of

Experts on Food Security and Nutrition recognize the idea that there will be no food systems sustainability without food and nutrition security and human health, and vice versa, that these too are dependent on sustainable food systems⁵.

Professionals from the field of nutrition and dietetics have long been actively involved in addressing food and nutrition security⁶ and increasingly the participation of this group in leadership and action related to sustainability, food systems and dietary patterns is deemed relevant⁷⁻⁹; they are trusted members of the health community, and advocates for individual and population health. For example, a dietitian is in a critical position to communicate to the public the ways in which personal food purchasing decisions affect the sustainability of the food system, in the same way, they must have the ability to articulate this knowledge in a clear, concise, and understandable way for clients of diverse cultural, economic, and educational levels¹⁰.

To maximize their potential, acquiring sustainability and food systems knowledge and skills during their dietetic-academic training is necessary and these topics have been identified as core competencies in dietetics¹¹. However, a recent international review of training standards available in English showed that of 23 dietetic training standards, only 16 included sustainable food systems-related content¹², and 59% required learning at a shallow level of cognitive complexity. Like English, Spanish is the professional language spoken in many nations, and therefore an obvious choice to help understand the international context more broadly. The purpose of this research is to investigate content related to sustainable food systems in training standards from Spanish-speaking countries and examine what level of knowledge is required.

METHODS

Guided by Drisko and Maschi¹³, researchers conducted a descriptive, content analysis of relevant documents informing standards that govern or influence what is taught in nutrition and dietetics curricula in Spanish-speaking countries. Twenty-one countries where Spanish is the dominant language in education were included: 19 South and Central American and Caribbean countries, 1 European country and 1 African country (Figure 1).

country where no competency documents were found, emails were sent to representatives of the NDA in each country inquiring about such documents. Due to the difficulty of finding associations or representatives of some countries, an email was sent to the International Confederation of Dietetics Association requesting a list of representatives for Spanish-speaking countries; through which contacts for Mexico, Argentina, and Brazil were obtained. Reminders were sent after seven days. This strategy did not result in additional included documents.

Data Extraction. Two independent researchers with Spanish fluency conducted a content analysis of each document using the Spanish search terms for concepts related to sustainable food systems and diets. Table 1 includes a list of search terms in Spanish, with English translations. This includes the search terms to locate association websites, key documents within those websites, and key search terms for the content analysis. Researchers extracted and documented the country, document title, a brief description, verbatim content related to sustainable food systems content, and any explanatory notes. A cloud-based spreadsheet was used to document and store data. A third researcher with expertise in sustainable food systems and dietetic education facilitated a discussion to ensure agreement on relevant content. There were no disagreements about which content was relevant for inclusion between the two researchers.

Data Analysis. Researchers used descriptive statistics and qualitative, open coding to analyze and characterize how concepts related to sustainable food systems were included.

Two researchers independently coded each document; there were no conflicting interpretations related to coding. Codes were then categorized using the a priori themes internationally recognized as dimensions of sustainability: environmental, social, and economic (4). A “transversal” theme was created to include any competence that did not fall directly in the social, environmental, or economic dimension, or that fell in more than one dimension, but that was relevant to the research project.

Following coding, the required depth of learning was then assessed using Bloom’s Revised Taxonomy¹⁴, which articulates domains in ascending order of cognitive complexity as follows: remember, understand, apply, analyze, evaluate, and create. Blooms revised taxonomy also articulates affective domains, also in ascending order, as: receive, respond, value, organize and characterize.

To determine the depth of knowledge, researchers examined the key verb or phrase meaning to establish which learning outcome (cognitive and/or affective) was the most appropriate, while recognizing that there may be variability in how educators interpret and teach each concept. Two independent researchers conducted the analysis. A third researcher with expertise in sustainable food systems and dietetic education verified the categorization of the codes and cognitive complexity; any adjustments were discussed and agreed upon by all three researchers.

Finally, researchers used descriptive statistics (frequencies) to provide additional insight into the nature of the content and level of cognitive complexity required of dietetic trainees in Spanish-speaking training programs.

Table 1. Key Search Terms in Spanish and English

Spanish	English
Search Terms to Find National Dietetics Associations	
<i>Asociaciones dietéticas</i>	<i>Dietetic Associations</i>
Search Terms to Find Professional Standards	
<i>Acreditación y competencias dietéticas</i>	<i>Accreditation and Dietary Competencies</i>
<i>Código deontológico de dietistas</i>	<i>Code of Ethics for Dieticians</i>
<i>Educación y prácticas dietéticas</i>	<i>Dietary education and practices</i>
<i>Estándares de Capacitación Dietética</i>	<i>Dietetic Training Standards</i>
Search Terms to Find Relevant Sustainability Content	
<i>Alimentación sostenibles</i>	<i>Sustainable Food</i>
<i>Desarrollo sostenible</i>	<i>Sustainable Development</i>
<i>Dietas Sostenibles</i>	<i>Sustainable Diets</i>
<i>Educación y prácticas dietéticas</i>	<i>Dietary Education and Practices</i>
<i>Entorno alimentario</i>	<i>Food Environment</i>
<i>Equidad nutricional</i>	<i>Nutritional Equity</i>
<i>Responsabilidad Social</i>	<i>Social Responsibility</i>
<i>Protección del medio ambiente</i>	<i>Environmental Protection</i>
<i>Seguridad Alimentaria y Nutricional</i>	<i>Food and Nutrition Security</i>
<i>Sistemas Alimentarios</i>	<i>Food Systems</i>
<i>Sistemas Alimentarios Sostenibles</i>	<i>Sustainable Food Systems</i>
<i>Sostenible</i>	<i>Sustainable</i>
<i>Sostenibilidad</i>	<i>Sustainability</i>
<i>Sostenibilidad social</i>	<i>Social Sustainability</i>

RESULTS

Of the 21 Spanish-speaking countries eligible, researchers were able to identify documents describing competencies, standards, or codes of ethics for six. In addition, one international set of standards from the International Confederation of Dietetics Associations were reviewed, but not included as there was no evidence, they were being used by any of the Spanish-speaking countries. The publication date of the included documents ranged from 2003 to 2022, and one did not include a publication date (Peru). Table 2 describes the country, the type and name of document found, if any, and whether there was relevant SFS content included.

Table 2. List of Documents Analyzed

Country	Document Type	Document Name	SFS
Colombia	Competency Profile for Dietitians	Perfil y Competencias del Profesional en Nutrición y Dietética ¹⁵	Yes
	Competency Profile for Health Professionals	Perfil y Competencias del Profesional en Salud ¹⁶	Yes
Mexico	Accreditation Standards	Marco de Referencia para el Proceso de Acreditación de los Programas Educativos en Nutriología por el Consejo Nacional Para la Calidad de Programas Educativos en Nutriología ¹⁷	Yes
Paraguay	Accreditation Standards	Modelo Nacional de Evaluación y Acreditación de la Educación Superior: Criterios de Calidad Para La Carrera de Nutrición ¹⁸	Yes
	Professional Profile	Perfil Profesional del Licenciado en Nutrición ¹⁹	Yes
Perú	Competency Profile	Perfil de Competencias Esenciales que Orientan la Formación de los Profesionales de la Salud ²⁰	Yes
Honduras	Code of Ethics	Ley Orgánica Del Colegio de Nutricionistas y Dietistas de Honduras ²¹	No
Spain	Competency Profile	Perfil de las Competencias del Titulado Universitario en Nutrición Humana y Dietética ²²	No
	Code of Ethics	Codigo Deontológico de la Profesión de Dietista-Nutricionista ²³	No

The distribution of SFS inclusion in the standards of Spanish-speaking countries is illustrated in Figure 1. Four countries included reference, at least in part, to sustainable food systems

and related concepts: Colombia, Mexico, Paraguay, and Peru; the details of the documents are found in Table 3. Of the remaining countries for which there were documents, the Honduran Code of Ethics, the Spanish Code of Ethics, and the Spanish competency documents did not refer to sustainable food systems concepts.

Table 3. Inclusion of Sustainable Food Systems in Standards Documents

Country	Category and Code	SFS Inclusion
Colombia Perfil y Competencias del Profesional en Nutrición y Dietética Perfil y Competencias del Profesional en Salud	SOCIAL Food and Nutrition (Health)	Specific Competences: Public Health: Periodically and systematically assess the problems related to the population's food and nutrition, its determining factors to seek improvement opportunities.
	TRANSVERSAL Food System	... works in the entire food process, from production, transportation, storage and marketing, to its industrial processing.
México Marco de Referencia para el Proceso de Acreditación de los Programas Educativos en Nutriología	SOCIAL Social Responsibility	The areas of knowledge, which should be located across the curriculum, such as: 1: Ethical commitment and social responsibility, and ... 2: Commitment to preserving the environment.
	ENVIRONMENTAL Environmental Preservation	
Paraguay Perfil del Profesional Licenciado en Nutrición	ECONOMIC Food and Nutrition (Security)	Design and develop a surveillance system for food and nutritional security at the local, district, regional and/or national level. Design, coordinate, implement and evaluate (f)ood (s)ecurity programs oriented towards the means of influence.
	SOCIAL Food and Nutrition (Policies)	Collaborate in the planning and development of policies in matters of food, nutrition and food security based on the needs of the population and the protection of health.
Peru Perfil de Competencias Esenciales Que Orientan la Formacion de los Profesionales de la Salud	SOCIAL Equity	... assuming a transforming role and facilitator of equitable access to health services...
	Human Right to Health	... recognizing health as an inalienable right and inherent to all human beings.
	ENVIRONMENTAL Environmentally Sustainable Diet	... defense of the population's right to a healthy diet, coming from an innocuous production and in harmony with the environment.

A document from Panama was found but not included: it is a government decree that describes in a general way the possible positions of the dietitian nutritionist and does not mention anything specific to sustainable food systems. No documents were found for the remaining Spanish-speaking countries in Figure 1.

The results indicate no mention of sustainable food systems or sustainable diets; however, several countries included partial inclusion through statements relating to one or more dimensions of sustainability and/or food systems. Five related to social sustainability, coded as Food and Nutrition (as it pertains to health), Food and Nutrition Policies, Social Responsibility, Equity and Human Right to Health. Two related to economic sustainability, both coded as Food and Nutrition Security (as food insecurity is primarily determined by income). Two related to environmental sustainability, coded as Environmental Preservation and Environmentally Sustainable Diet. Table 3 details the category (dimension of sustainability) and codes included, and the text from which it was drawn. Their inclusion is problematized in the discussion.

Table 4 summarizes the level of cognitive complexity with which dietetics students and nutrition and dietetics professionals (depending on how standards were articulated) are expected to demonstrate their understanding of sustainable food systems and related concepts. Three standards statements aligned with the “understand” level, and one aligned with the “evaluate” level, both relatively low levels of cognitive complexity. Four reflected a high level of cognitive complexity, requiring students to “create.” Three of the statements moved beyond the cognitive domain of learning, also representing “values” and captured in the affective domain of Bloom Revised Taxonomy.

Table 4. Bloom's Revised Taxonomy

Level	Total	
<i>Cognitive Domain</i>		
Apply	0	
Understand	3	<ul style="list-style-type: none"> The areas of <u>knowledge</u>, which should be located across the curriculum, such as: <ul style="list-style-type: none"> 1: Ethical commitment and social responsibility, and 2: Commitment to preserving the environment. <u>Recognize</u> health as an inalienable right
Evaluate	1	<ul style="list-style-type: none"> Periodically and systematically <u>evaluate</u> problems related to the population's food and nutrition.
Analyze	0	
Create	4	<ul style="list-style-type: none"> Collaborate in the <u>planning and development</u> of policies in matters of food, nutrition and food security. <u>Design and develop</u> a surveillance system for food and nutritional security at the local, district, regional and/or national level. <u>Design, coordinate, implement</u> and evaluate Food Security programs oriented towards the medium of influence. ... <u>assuming a transforming role</u> and facilitator of equitable access to health services...
<i>Affective Domain</i>		
Receive	0	
Respond	0	
Value	3	<ul style="list-style-type: none"> The areas of knowledge, which should be located across the curriculum, such as: <ul style="list-style-type: none"> 1: <u>Ethical commitment and social responsibility</u>, and 2: <u>Commitment</u> to preserving the environment. The <u>ethics</u> of the professional nutritionist acquires particular relevance in the defense of the population's <u>right to a</u> healthy diet, coming from an innocuous production and in harmony with the environment.
Organize	0	
Characterize	0	

DISCUSSION

Of the 21 Spanish-speaking countries (Figure 1), relevant documents about the standards in six countries were obtained, of which four countries (66.6%, Table 2) included sustainable food systems-related content (Table 3). All documents in this research capture important but

partial concepts that contribute to sustainability dimensions or food systems, such as “environmental preservation”; no documents used cross-cutting, or transversal concepts like “sustainable food systems,” nor described activities related to the full definition set out by the United Nations⁴. According to Bloom's Revised Taxonomy¹⁴ for assessing learning objectives, the documents indicated a mix of required complexity in the cognitive domain, ranging from low (understand, evaluate), to high (create), as well as including some from affective domain (values).

These results are comparable to a recent international review of training standards available in English, which turned up 23 standards, 16 of which (69.5%) included sustainable-food systems-related content¹². This international review found that more than 50% used transversal language, like “food systems” or “sustainable,” but unlike the Spanish-speaking countries, many with little detail about what that means.

The documents found represented a mix of competency profiles, accreditation standards, professional profiles, and codes of conduct. Therefore, they govern a mixture of education and training standards as well as practice expectations; however, practice expectations inform education and training. While imperfect, all of these documents inform an understanding of sustainable food systems content in nutrition and dietetic training in Spanish-speaking nations.

The accreditation standards in Mexico, updated in 2016, make explicit reference to social and environmental sustainability concepts, specifically naming ethical commitment, social responsibility, and commitment to preserving the environment. Interestingly, the standards from Mexico represented a low level of required cognitive complexity (understand) at the same time implying the topic requires the engagement of the affective domain (values). The affective domain did not emerge in a recent review of standards documents available in English¹².

The standards documents from Paraguay, updated in 2013, articulate economic and social sustainability concepts through recognition of dietitian-nutritionists' roles in monitoring and addressing food and nutrition security, including through policies. While food and nutrition insecurity almost always has its roots in economic disempowerment, programming and policy work (a common part of many dietitian-nutritionist roles globally) to address such social inequities has been suggested as an important role for dietitians in contributing to more

socially sustainable food systems²⁴. The level of cognitive complexity implied by all three relevant standards for Paraguay was “create” – or the highest in the cognitive domain of Bloom's Revised Taxonomy (Table 2). Expecting graduates or entry-level practitioners to have the skills to contribute to creating solutions for food and nutrition security, which are an inseparable part of sustainable food systems⁵, sets a high bar and is valuable to ensure that food and nutrition professionals in Paraguay are well-prepared to contribute to this multidisciplinary challenge alongside their colleagues from other fields.

In Colombia, the Competency Profiles for Health Professionals (2016) position dietitian-nutritionists as working within and throughout the food system, from production, transportation, processing, and storage to marketing. This is an important recognition in setting graduates up to understand the many leverage points in the system to which they can contribute²⁵. While the Competency Profiles for (Colombian) Dietitians (2015) does not make additional or explicit links to the sustainability of the food system they are working within, the document does indicate that dietitian-nutritionists have the purview to evaluate (relatively low level of complexity in the cognitive domain) factors that affect population food and nutrition and to seek opportunities to address them. This can, and often does, include food system factors related to social and environmental determinants¹. A food system that systematically undermines population food access and nutrition is not sustainable²⁶; as such, while the links to the sustainability of the food system appear indirect, they are important.

The professional competencies from Peru, for which there was no date, positioned access to a healthy, environmentally sustainable diet as a human right and the nutritionist as a facilitator of equitable access to that right. This emphasizes social and environmental dimensions of sustainability, and indirectly economic dimensions as economic barriers are the primary drivers of inequity in food access. The standards required a high level of cognitive complexity (up to “create”), per Paraguay, and were values-oriented, per Mexico. As such, Peru’s standards offered some of the most comprehensive in their approach to incorporating sustainable food systems dimensions into the dietetics professional standards. This document describes the competency profiles for health professionals, including nutritionists and therefore does not guarantee what is being taught in training programs.

In the context of urgent global commitments on climate change and sustainable development, the opportunities for food, nutrition and dietetics professionals to contribute

have been recognized²⁷. This research adds to a small body of evidence documenting the state of readiness of nutrition and dietetics professionals to contribute to sustainable development. It points to the likelihood that nutrition and dietetics professionals in these countries are equipped to address some aspects of sustainable food systems and are encouraged to value them. However, like other standards internationally¹², these results indicate partial coverage of the concepts and highlight opportunities for increased emphasis on comprehensive sustainability-informed education and training standards which prepare practitioners for effective practice.

Sustainability and food systems concepts have been identified as core dietetics competencies yet mentioned infrequently relative to other core competencies¹¹. This indicates that in most training standards the topic is showing up as an additional topic to learn about. New paradigms underpinned by sustainability and food systems thinking have been called for to guide this work^{28,29} and this approach suggests that adding *more detailed* content to education standards may not be the needed approach; situating all competencies within a framework, like Planetary Health³⁰, may support integrated and effective learning.

Limitations. That only 6 of the 21 countries searched had standards documents available may not indicate a lack of educational standards, but rather be a limitation of the study design, which made assumptions based on how other nations standardized knowledge requirements. No individuals contacted indicated another format or process was needed, but this does not preclude the existence of standards not available. Other potential issues affecting the availability of standards-related documents include the absence of national dietetics associations or organizations governing education standards, few schools of nutrition and dietetics, and whether standards are digitized and available on the internet.

Only 4 countries included reference to sustainability may have related to publication dates and global priority trends. The document publication dates, which ranged from 2003 to 2022, may have influenced the inclusion of SFS related content, as well as the vocabulary, which evolves with language over time. Sustainable food systems related discourse on an international scale was amplified by the release of the High-Level Panel of Experts report on Food and Nutrition Security in 2014⁴, and so the age of several of the documents may reflect a natural delay in concept uptake. The standards from Mexico and Colombia were published in 2016 and make explicit reference to sustainability-related dimensions and/or food systems

concepts. The standards from Paraguay, on the other hand, published in 2013, refer to food and nutrition security, a related topic that emerged in the nutrition and dietetics field much earlier. For example, references to food and nutrition security had entered the language used by the American Dietetic Association (later named the Academy of Nutrition and Dietetics) in the 1990s⁶. Its connection to sustainable food systems entered the global health dialogue much later, in 2017⁵.

CONCLUSIONS

Overall, very little comprehensive inclusion of sustainable food systems was included in the available documents, but partial inclusion of one or more important sustainability dimensions was found. Colombia, Mexico, Paraguay, and Peru, are unique in Latin America in including one or more of the social, ecological or economic dimensions of sustainability (e.g., ethical commitments to social responsibility and environmental preservation, equitable access to healthy diets from environmentally sustainable production systems) as part of their nutrition and dietetics education curricula or professional competencies. Colombia is unique in explicitly naming the purview of health professionals as spanning food systems sectors from production to consumption. This research highlights opportunities to include more comprehensive coverage of sustainable food systems dimensions and related concepts to prepare nutrition and dietetics professionals to contribute more effectively to sustainable development.

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COMPETING INTERESTS

The authors declare that there has been no funding to carry out this study.

AUTHORS' CONTRIBUTIONS

LC was involved in conceptualization of the research question and methods, supervision of the data collection, and revising the manuscript. NR and KU led the data collection, analysis, and writing the initial draft of the manuscript.

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