



## Validation of the Book on Updates in Chronic Diseases

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**ABSTRACT:** Noncommunicable chronic diseases are long-term conditions characterized by complexity and multifactorial etiologies. The objective of this study was to validate the book *Updates on Noncommunicable Chronic Diseases: Applicability of Nutrition, Physical Exercise, Phytotherapy, and Medicinal Plants*. The study was approved by the local ethics committee and followed a methodological design focused on the validation of instructional material. Content validation was conducted by 30 physicians representing different medical specialties. Eligibility criteria for expert judges included at least two years of professional practice following medical graduation and a specialist medical degree. Non-eligibility criteria included being a non-medical health professional or failure to sign the Informed Consent Form. Additionally, judges who did not complete the evaluation instruments within 15 days were excluded. Judges received, via WhatsApp, a digital version of the book (PDF) and a link providing access to the Invitation Letter, the Informed Consent Form, and the evaluation questionnaires. Data from the validation instrument were analyzed using Cronbach's alpha coefficient and the Content Validity Index (CVI). All 30 judges completed the evaluations; of these, 53.3% were male, and 50% were between 51 and 60 years of age. The internal consistency of the instrument was high (Cronbach's alpha = 0.8554), and all evaluated items achieved a global CVI of 1.00, with judges rating every item as fully adequate or adequate. The book was validated as an effective and comprehensive educational resource capable of supporting health professionals, students, and other stakeholders involved in the prevention and management of noncommunicable chronic diseases.

**KEYWORDS:** Textbook, Noncommunicable Diseases, Validation Study, Exercise, Plants, Medicinal.

## INTRODUCTION

Noncommunicable chronic diseases (NCDs) are long-term conditions of multifactorial origin, involving genetic, physiological, environmental, and behavioral factors. The main NCDs include thrombotic events or infarctions (such as myocardial infarction and stroke), which account for 17.9 million deaths annually; cancer, responsible for 9.3 million deaths; chronic respiratory diseases (such as chronic obstructive pulmonary disease and asthma), responsible for 4.3 million deaths; and diabetes, which causes 2 million deaths per year (WORLD HEALTH ORGANIZATION, 2023).

Each year, 41 million people die from NCDs, representing 74% of all global deaths, and 77% of these occur in low- and middle-income countries. Regarding premature deaths, 17 million occur annually, with 86% affecting low- and middle-income nations (WORLD HEALTH ORGANIZATION, 2023). In Brazil, NCDs accounted for 41.8% of premature deaths (ages 30–69 years) in 2019, and overall, 54.7% of all deaths recorded were attributed to NCDs, with an additional 11.5% resulting from NCD-related complications (BRASIL, 2021; BRASIL, 2023).

NCDs often begin silently and may take years to be diagnosed. Their clinical course may change over time, with the occurrence of acute symptoms, discomfort, pain, and disability. Management requires multiprofessional interventions combined with lifestyle and dietary modifications—an ongoing process that may lead to cure or symptom reduction (STRINGHINI et al., 2017).

This high burden is associated with growing exposure to modifiable risk factors—tobacco use, alcohol consumption, obesity, physical inactivity, unhealthy diets, and air pollution—which can be changed without major cost or difficulty (WORLD HEALTH ORGANIZATION, 2023). Modern lifestyles contribute significantly to the development of NCDs: daily stress, limited time for self-care, unfavorable social determinants, low socioeconomic status, inadequate health guidance, and insufficient public policies

focused on prevention all serve as predictors of morbidity and premature mortality (HATEFI et al., 2018; PAES-SOUSA et al., 2018; STRINGHINI et al., 2017).

Health promotion strategies—especially lifestyle modification and regular physical activity—are essential for prevention. In 2011, the Brazilian Ministry of Health launched a Strategic Action Plan for confronting NCDs, aimed at implementing effective, integrated, sustainable, evidence-based public policies (BRASIL, 2021). A new plan, the Strategic Action Plan for Tackling Chronic Diseases and Noncommunicable Health Conditions (Plano DANT), was created for 2021–2030, strengthening national, state, and municipal efforts to reduce NCDs, violence, and injuries, while promoting health across sectors (BRASIL, 2021).

The World Health Organization also developed a set of 16 cost-effective “best buy” interventions to reduce NCD deaths—actions considered practical, affordable, and feasible worldwide. These include increasing tobacco taxes, restricting alcohol advertising, reformulating foods to reduce salt, sugar, and fat, vaccinating women against cervical cancer, and treating hypertension and diabetes. Implemented globally, these measures could save 10 million lives by 2025 and prevent 17 million strokes and heart attacks by 2030 (WORLD HEALTH ORGANIZATION, 2020).

To monitor progress toward these goals, Brazil integrated structured NCD surveillance systems, including the Surveillance System for Risk and Protective Factors for Chronic Diseases by Telephone Survey (Vigitel), the National Health Survey (PNS), and the National School Health Survey (PeNSE). These systems track trends and monitor target achievement through historical analyses (MALTA et al., 2017).

Obesity is one of the most prevalent NCDs. Poor dietary quality, physical inactivity, consumption of processed and ultra-processed foods, and emotional, social, and genetic factors contribute to its development. Obesity is considered a global epidemic, and the WHO prioritizes its treatment because it increases the risk of hypertension, type 2 diabetes, cardiovascular diseases, and other conditions (SANTOS, 2023). In Brazil, 6.7 million people are affected. In 2022, 863,086 individuals presented morbid obesity (BMI  $\geq 40$  kg/m<sup>2</sup>) (SOCIEDADE BRASILEIRA DE CIRURGIA BARIÁTRICA E METABÓLICA, 2023).

Eating disorders (EDs) represent another relevant NCD. They involve persistent disturbances in eating behavior and food intake that impair physical health and psychosocial functioning. Distorted body image and compromised self-esteem are common clinical features (RODGERS et al., 2023). A metaanalysis estimated that among individuals over 10 years old, 0.1% have anorexia nervosa, 1.16% bulimia nervosa, and 3.53% binge eating disorder (TRINDADE et al., 2019).

Inflammatory bowel diseases (IBD)—Crohn’s disease and ulcerative colitis—are also important NCDs. They are chronic inflammatory conditions of the gastrointestinal tract marked by alternating periods of remission and disease activity (FLYNN & EISENSTEIN, 2019). Acute-phase symptoms include weight loss and deficiencies in proteins, vitamins, and minerals. During remission, nutritional status may normalize in Crohn’s disease, while ulcerative colitis may still present specific deficiencies, such as iron-deficiency or megaloblastic anemia. Nutritional care is therefore essential for preventing and treating malnutrition and specific nutrient deficiencies (DANPANICKUL et al., 2023). Hypertension (HTN) is a major global NCD and is characterized by persistent blood pressure levels  $\geq 140/90$  mmHg. Its prevalence increases with age, and its asymptomatic nature leads to inadequate control. In Brazil, hypertension prevalence rose from 22.6% in 2006 to 26.3% in 2021, with higher rates among men. From 2010 to 2020, 551,262 deaths from hypertensive diseases were recorded, including 292,339 among women and 258,871 among men (BARROSO et al., 2021; BRASIL, 2022a; JULIÃO & GUIMARÃES, 2021; WORLD HEALTH ORGANIZATION, 2021).

Atherosclerosis is another multifactorial NCD characterized by lipid accumulation and vessel wall inflammation, leading to calcified plaque formation. This results in arterial obstruction, reduced blood flow, and organ damage. It is a systemic disease that can affect multiple vascular territories simultaneously (BRASIL, 2022b).

Polycystic ovary syndrome (PCOS), affecting 15–20% of women of reproductive age, is also considered a significant NCD. It has reproductive, endocrine, dermatological, cardiovascular, and psychological consequences, including infertility, menstrual irregularities, and androgenic symptoms. Obesity is a major contributing factor, with most women with PCOS presenting excess weight. Worldwide, approximately 105 million women aged 15–49 years—4 million in the United States—are affected (SANTOS & ÁLVARES, 2018).

These NCDs illustrate the strong influence of lifestyle on disease onset and progression. Smoking, excessive alcohol intake, poor dietary habits, physical inactivity, and stress contribute to the global NCD epidemic. This scenario reinforces the need for effective prevention and treatment strategies focused on diet and lifestyle (NILSON et al., 2020).

Nutritional needs refer to the amount of nutrients and energy a healthy individual must consume to maintain physiological balance and prevent deficiencies. Nutritional recommendations indicate the optimal intake required to ensure health and prevent diet-related complications (CUPPARI, 2018).

To support NCD control, many countries have developed dietary guidelines to translate nutritional recommendations into practical messages for the population. In addition to guidelines, individualized nutritional counseling provided by qualified nutritionists remains essential (BRASIL, 2014). Such strategies facilitate dietary improvements, reduce difficulties related to eating behavior, and promote personal autonomy in self-care (BRASIL, 2014).

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Physical inactivity is also a modifiable risk factor strongly associated with NCD development (DHAWAN & SHARMA, 2020). Moderate physical activity is widely recognized as a prerequisite for health, offering benefits to nervous, cardiovascular, endocrine, respiratory, renal, digestive, and immune systems (DUTRA et al., 2022).

The use of biologically active compounds derived from medicinal plants—known as phytotherapeutics—is an emerging strategy. These compounds are considered safe and promising tools for developing low-cost treatments with fewer adverse effects and for supporting disease prevention (NADAF et al., 2019). Approximately 30% of the pharmaceutical market and 11% of essential medicines originate from plants (SOUSA et al., 2018). The traditional use of native medicinal plants by Indigenous, rural, and ancient populations contributed to the development of contemporary phytotherapeutic practices, which are globally encouraged by the WHO (SAIFULAZMI et al., 2022).

In Brazil, the National Policy on Integrative and Complementary Practices (PNPIC), launched in 2006, introduced phytotherapy within the National Health System (SUS), particularly in Primary Health Care (BRASIL, 2015).

The objective of this study was to validate the book “Update on Noncommunicable Chronic Diseases: Applicability of Nutrition, Physical Exercise, Phytotherapy, and Medicinal Plants”.

## METHODS

This research was approved by the local ethics committee under protocol number 6,974,057. This is a study of the instructional material validation type. The book validation was conducted by 30 physicians from different medical specialties. According to Alexandre and Coluci (2011), the ideal number of judges for content validity studies ranges from six to twenty. The inclusion criteria for judges were: having at least two years of graduation in medicine and holding a specialist medical degree. Non-inclusion criteria were: other health professionals and failure to sign the Informed Consent Form. Exclusion criteria were: failure to complete the questionnaires within a maximum period of 15 days.

The recruitment of judges was carried out using a personal list compiled by the principal investigator, containing the names of 50 physicians, their private practice addresses, and professional and/or personal phone numbers. The lists were numbered from 1 to 50, and participants were selected using the website <https://www.random.org/>.

The judges invited to validate the book were initially contacted by phone. Those who agreed to participate received, via the WhatsApp mobile application or email, a PDF file of the book and a link to access Google Forms, which included the invitation letter, the Informed Consent Form (ICF), and the research questionnaire.

To enroll in the study, judges clicked the acceptance tab in Google Forms and were then directed to the section containing questions about their personal characteristics and the book. At the end of the questionnaire, judges clicked the submit tab, and the completed Google Forms document was forwarded to the researchers' email.

The judges who verbally accepted the invitation by phone but did not respond to Google Forms within 15 days were excluded from the study.

Responses submitted through Google Forms were exported to Microsoft Excel for subsequent statistical analysis.

The research questionnaire contained questions regarding judges' personal characteristics, such as sex, age, years since medical graduation, and specialty. The questionnaire for book validation addressed the following aspects: sequence of chapter information, ease of understanding, language used, relevance of content, and scientific content of the chapters. Each question included a space for comments and suggestions. Responses were measured using a Likert scale with the following options: “fully adequate,” “adequate,” “partially adequate,” and “inadequate”. For data analysis, responses marked as “adequate” or “fully adequate” were considered indicators of validation.

Statistical analysis was performed using the Statistical Package for the Social Sciences, Inc. (SPSS), Chicago, USA, version 22.0. Measures of central tendency were used to analyze quantitative variables, whereas absolute and relative frequencies were used for categorical variables.

To assess the internal consistency of the research instrument, Cronbach's alpha ( $\alpha$ ) coefficient was used. This coefficient estimates the reliability of a questionnaire administered in research and it was defined by Lee J. Cronbach in 1951. It measures the correlation between responses by analyzing the average inter-item correlation. Cronbach's alpha is calculated based on the variance of individual items and the variance of the sum of items for each evaluator in instruments using the same measurement scale (Bland & Altman, 1997). For this study, a minimum acceptable value of 0.61 was adopted to consider the instrument reliable (Landis & Koch, 1977).

To quantify the degree of agreement among respondents regarding specific aspects of the instrument and its items, the Content Validity Index (CVI) was used. This index allows for the analysis of each item individually and the instrument as a whole. Responses may vary, for example, from relevant to non-representative or from clear to unclear (Wynd et al., 2003). The CVI for questionnaire validation must be greater than or equal to 0.78 when six or more judges participate (Wynd et al., 2003).

## RESULTS

Personal characteristics of the physicians who validated the book “Updates in Noncommunicable Chronic Diseases: Applicability of Nutrition, Physical Exercise, Phytotherapy, and Medicinal Plants” are presented in Table 1.

**Table 1 - Personal characteristics of the physicians (n=30) who validated the book “Updates in Noncommunicable Chronic Diseases: Applicability of Nutrition, Physical Exercise, Phytotherapy, and Medicinal Plants”.**

Personal characteristics		%
Gender	Female	46,7
	Male	53,3
Age Group (years)	20 to 30	3,3
	31 to 40	26,7
	41 to 50	16,7
	51 to 60	50
	> 60	3,3
Medical degree (years)	2 to 10	30
	11 to 15	3,3
	16 to 20	6,7
	21 to 25	26,7
	26 to 30	16,7
Medical specialty	Clinical	55
	Surgical	45

Table 2 and 3 presents the Cronbach’s Alpha and Content Validity Index (CVI), respectively, values for the domains of the validation questionnaire for the book “*Updates in Noncommunicable Chronic Diseases: Applicability of Nutrition, Physical Exercise, Phytotherapy, and Medicinal Plants.*”

**Table 2 - Cronbach’s Alpha for the questionnaire domains used in the validation of the book “Updates in Noncommunicable Chronic Diseases: Applicability of Nutrition, Physical Exercise, Phytotherapy, and Medicinal Plants” (n=30).**

QUESTIONS	Mean	Standard Deviation	Cronbach’s Alpha
Cover layout	22,467	2,013	0,8547
Image quality	22,5	1,996	0,8554
Information sequence	22,633	1,847	0,8205
Comprehensibility of the chapters	22,533	1,907	0,8291
Chapter language	22,6	1,886	0,8318
Relevance of the content	22,5	1,943	0,8365
Scientific content	22,567	1,851	0,8123
Global Cronbach’s Alpha			0,8554

**Table 3 – Content Validity Index (CVI) for the questionnaire domains used in the validation of the book “Updates in Noncommunicable Chronic Diseases: Applicability of Nutrition, Physical Exercise, Phytotherapy, and Medicinal Plants” (n=30).**

QUESTIONS	I	PA	A	FA	CVI (%)
Cover layout	0	0	5	25	1,00
Image quality	0	0	6	24	1,00
Information sequence	0	0	10	20	1,00
Comprehensibility of the chapters	0	0	7	23	1,00
Chapter language	0	0	9	21	1,00
Relevance of the content	0	0	6	24	1,00
Scientific content	0	0	8	22	1,00
Global CVI					1,00

I: inadequately. PA: partially adequate. A: adequate. FA: fully adequate.



## DISCUSSION

The validation conducted by expert judges represents an essential stage in the development of educational health materials, particularly when addressing complex themes such as chronic noncommunicable diseases (NCDs). In the present study, 30 judges evaluated the book *Validation of the Book on Updates in Chronic Diseases*, contributing to a detailed examination of the clarity, relevance, and consistency of its content. The results revealed excellent psychometric indices, confirming the robustness of the methodological approach employed. The literature emphasizes that content validity ensures that an educational instrument adequately represents the construct of interest and remains comprehensible to the target audience, a principle highlighted in the methodological guidelines proposed by Alexandre and Coluci (2011).

The profile of the judges revealed a predominance of male participants (53.3%) and an age distribution concentrated between 51 and 60 years (50%). This suggests that the validation was carried out by highly experienced professionals, many with longstanding clinical and academic backgrounds, which strengthens the quality of the evaluative process. The involvement of senior specialists tends to enhance the credibility of educational instruments, especially those addressing complex issues such as cardiovascular risk factors, hypertension, and obesity—topics emphasized in the Brazilian Guidelines for Arterial Hypertension, which underscore the importance of disseminating updated knowledge about these conditions (Barroso et al., 2021).

The Cronbach's Alpha coefficient obtained (0.8554) demonstrates high internal consistency, reflecting strong agreement among evaluators and indicating that the items assessed effectively measured a common underlying construct. From a statistical perspective, values above 0.80 are considered very good, evidencing the reliability of the instrument used to validate the book. This interpretation aligns with the foundational concepts described by Bland and Altman (1997), who emphasize alpha as an indispensable measure for assessing the homogeneity of scales and questionnaires.

Additionally, the Content Validity Index (CVI) reached 100% agreement among judges, who classified all evaluated items as either “Fully Adequate” or “Adequate.” This type of unanimous agreement is rarely observed in validation studies and strongly suggests that the material possesses scientific relevance, thematic precision, and appropriate didactic structure. Achieving such a high CVI is consistent with classical psychometric standards, including those articulated by Cronbach (1951), who underscores the centrality of validity within the structure of any measurement instrument.

The unanimity observed in the global CVI reinforces the overall adequacy of the content addressed in the book, which aims to present updates on chronic diseases relevant to public health. Ensuring alignment with national policies and recommendations is essential, particularly given the impact of NCDs as leading causes of morbidity and mortality in Brazil. Official documents such as the *Strategic Action Plan for Tackling Chronic Noncommunicable Diseases in Brazil 2021–2030* highlight the urgency of disseminating evidence-based educational materials intended for both health professionals and the general population (Brazil, 2021).

The inclusion of expert judges in the validation process enhances the precision with which the relevance and pertinence of the topics addressed are assessed. NCDs demand constant updates due to their multifactorial nature and strong association with behavioral, environmental, and socioeconomic determinants. For instance, conditions such as hypertension, diabetes, and obesity—extensively discussed in the book—remain central challenges recognized by epidemiological surveillance systems. Data from the VIGITEL report (Brazil, 2022a) indicate a 3.7% increase in adults with hypertension over the past 15 years, highlighting the relevance of producing educational materials that support prevention and disease management.

The content evaluated by experts includes contemporary discussions on pathophysiology, preventive strategies, and therapeutic updates, integrating nutritional, behavioral, and pharmacological considerations. Addressing adequate dietary patterns, for example, is crucial given the established relationship between diet and NCD risk. The *Dietary Guidelines for the Brazilian Population* emphasize the influence of eating patterns on health outcomes (Brazil, 2014). Thus, the inclusion of updated and evidence-based nutritional guidance within the book significantly contributes to its educational value.

Another essential point relates to the importance of regular physical activity in preventing and managing NCDs. The literature demonstrates the positive impact of exercise on immune modulation, chronic inflammation, and metabolic control—factors particularly relevant to cardiovascular diseases, obesity, and autoimmune conditions. Dutra et al. (2022) highlight the protective role of physical activity, which influences numerous physiological mechanisms. The appropriate integration of this subject matter into the book was positively received by judges, supporting the high scores awarded in the validation process.

The global epidemiology of NCDs also reinforces the need for updated educational materials capable of informing clinical practice and public policies. Studies show that population aging contributes significantly to the growing prevalence of inflammatory and metabolic diseases. Danpanichkul et al. (2023) report an increase in elderly-onset inflammatory bowel diseases, demonstrating the necessity for continuous updates on evolving epidemiological trends—an aspect well addressed in the evaluated material.

The validation criteria employed by the judges ensured that the book presented content aligned with the most current scientific evidence, encompassing not only epidemiological and clinical dimensions but also the socioeconomic determinants influencing NCDs. Multiple studies confirm that low income, limited education, and social inequalities intensify the risk of mortality from chronic diseases. In this context, Stringhini et al. (2017) demonstrate that socioeconomic status is directly associated with risk behaviors and adverse health outcomes, strengthening the importance of educational materials that incorporate these determinants.

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Additionally, the expert validation process ensured that the content was accessible and applicable to diverse health professionals. The literature indicates that practitioners frequently lack updated resources on NCDs because of the rapid development of new scientific evidence. Malta et al. (2017) emphasize the need to expand continuing education initiatives to improve NCD management and surveillance in Brazil, further reinforcing the social and academic relevance of the evaluated book.

Another positive aspect of the validation concerns the adequacy of content related to integrative and complementary therapeutic strategies, which have gained prominence in the context of NCDs. The National Policy on Integrative and Complementary Practices (PNPIC) recommends expanding access to practices such as herbal medicine, meditation, and acupuncture, which may complement conventional approaches (Brazil, 2015). The inclusion of such themes in the book was recognized as pertinent by the judges, demonstrating the multidimensional nature of the material.

Editorial quality and didactic organization were also highly rated, confirming that the book meets established criteria of clarity, coherence, and applicability. Logical structure, progressive topic development, and accessible language facilitate learning, contributing to the high scores assigned by experts. Wynd, Schmidt, and Schaefer (2003) note that instruments with high content validity tend to achieve greater acceptance and practical applicability, particularly when developed systematically and rigorously.

In summary, the validation process demonstrated that the book *Validation of the Book on Updates in Chronic Diseases* possesses scientific and pedagogical excellence, offering updated, relevant, and guideline-aligned information consistent with national and international recommendations. The results—Cronbach's Alpha of 0.8554 and a CVI of 100%—indicate high reliability, conceptual clarity, and thematic consistency. The strong agreement among judges reflects the methodological rigor of the study, supporting the suitability of the book as a resource for professionals, students, and researchers in the health field. This aligns with the World Health Organization's recommendations (2020), which emphasize the importance of disseminating evidence-based information to advance global NCD prevention and control efforts.

## CONCLUSION

The findings of this study demonstrate that the book *Updates on Chronic Noncommunicable Diseases: Applicability of Nutrition, Physical Exercise, Phytotherapy, and Medicinal Plants* achieved excellent scientific and pedagogical validation. The high internal consistency (Cronbach's Alpha = 0.8554) and the unanimous agreement among expert judges regarding the adequacy of all items (CVI = 100%) confirm that the material is reliable, relevant, and aligned with current evidence and public health guidelines. Therefore, the book is validated as an effective and comprehensive educational tool, capable of supporting health professionals, students, and stakeholders involved in the prevention and management of chronic noncommunicable diseases.

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