

Mapping Human Health Care Content in Pakistan's Single National Curriculum
(2022): A Content Analysis of General Science Textbooks for Grades 6-8

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ABSTRACT

The present study aims to investigate the content coverage of human health care in the General Science textbooks of the 6th, 7th and 8th Grades of the Single National Curriculum (SNC, 2022) of Pakistan. While health literacy has come to be seen as a competency that should be developed in schools, especially at the science educational level, the extent to which this dimension is covered in the elementary science curriculum in Pakistan remains under researched. The study is conducted with qualitative content analysis design and a structured checklist is used to analyse content of textbooks in the following five categories: Personal Hygiene, Food and Healthy Diet, Human Body Systems, Disease Prevention and Health and Lifestyle Practices. Purposeful selection is done for the three officially approved textbooks of General Science (Science Textbook Board Khyber Pakhtunkhwa) and examined for the coverage, depth and grade wise progression of content related to health. The findings show that overall coverage is moderate at 64 percent (across the three grades) and varies in coverage, with a low coverage in grade 7 because there is no Food and Healthy Diet content. The category with the most consistent and comprehensive coverage is Human Body Systems, and the weakest is Personal Hygiene and Health, which often is covered only as a side issue and not in a dedicated topic. The study indicates that the curriculum has an acceptable scientific basis for the study of health, but it does not offer a sequential, developmentally appropriate program that emphasizes the behavioral/lifestyle aspects of health. The study suggests that curriculum developers re-think the sequence, enrichment and level of health care content included in the curriculum so that students in elementary schools will have access to real life health-related information and healthy lifestyles.

Keywords: Content analysis, health care content, Single National Curriculum, General Science, elementary education, Pakistan.

INTRODUCTION

It is widely acknowledged that health is a fundamental determinant of a child's ability to learn, participate and thrive at school, and it is now common to find the incorporation of health-related topics in the national curricula in most countries, not as a separate subject but in other subjects such as mathematics, science, languages, and literacy (Vamos et al., 2020). Science education in particular is seen as a natural place for health content because of its evidence-based approach: in both science

education and health literacy, the learners should be able to interpret, assess and apply scientific reasoning to everyday decisions (Paakkari & Okan, 2020). Okan et al. (2021) highlight that, despite the continued impact of health challenges on school-aged populations in low- and middle-income countries, including communicable diseases, poor sanitation, and lifestyle-related illness, health knowledge is introduced and sequenced in the curriculum with a great deal of interest.

Comparative curriculum research reveals that countries have varying perspectives on the inclusion of health and hygiene in the science curriculum rather than in other learning areas, as well as differing levels of systematic progression of health and hygiene content across grade levels. Science curricula appear to have a common disciplinary structure across nations, but the content related to health is much more localized and varies based on local disease burdens, cultural norms and policy agendas rather than a single model of progression (Morrish & Neesam, 2021). These differences highlight the value of looking at the health content coverage at the national level, not to simply generalise to international trends. Additional health literacy evidence also indicates that fragmented or inconsistent health literacy instruction across the school building decreases the likelihood of establishing enduring skills that will equip students with the ability to access, understand and apply health literacy in their everyday lives (Okan et al., 2021; Nash et al., 2018).

The Single National Curriculum (SNC) is a major development in Pakistan's education system since its introduction in 2022, which replaced the existing system that resulted in unequal learning outcomes and produced a situation where boys out-performed girls in learning due to their exposure to different curricula and teachers in government, private and religious (Deeni Madaris) schools (Farooq et al., 2022). SNC's General Science content for grades 6-8 was developed around strands, standards, benchmarks, and student learning outcomes that were designed to encourage activity-based, competency-oriented learning rather than rote learning. While a few studies have focused on the SNC's structural design, how it relates to assessment frameworks, and how religious and social content is addressed, comparatively little attention has been paid to the comprehensiveness and cohesiveness of the curriculum in terms of human health care content specifically (Vamos et al., 2020) when it should be seen as a broad, well-sequenced exposure of this content across the school years.

There is a specific gap in this area that is significant at the elementary level (Grades 6–8), when adolescents are creating health behaviors that will last a lifetime and are more likely to understand more complex health-related concepts, including disease prevention, nutrition, and body systems (Okan et al., 2021). If health care content is not known to be distributed, sequenced, and emphasized in the General Science curriculum, it is hard to know whether students are getting enough chances to develop their health literacy in addition to scientific literacy, and this is difficult to determine by curriculum developers, textbook writers, and teacher educators. This study thus systematically analyzes the Single National Curriculum (2022) for General Science grade 6-8 for the extent and nature of content coverage of human health care. The aim of the study is to identify strengths, gaps and areas to be improved in the science curriculum by comparing this content with the known health domains, which can be useful for the further development of the international literature on health content in science curricula and for context-specific evidence to guide future revision of the national curriculum in Pakistan.

Objective of the study

To examine the human health care content coverage in the Single National Curriculum (2022) for Grade 6, 7, and 8 General Science

Research Question

What is the extent of human health care content coverage in the Single National Curriculum (2022) for Grade 6, 7, and 8 General Science?

Health Literacy and Curriculum Integration: A Global Perspective

Increasingly, health literacy has been identified as a skill that is not only the responsibility of health systems, but also schools, as the cognitive and social skills that underlie the ability to access, understand, and act upon health information (Vamos et al., 2020). The literature from around the world supports the notion that health literacy is a cumulative process (Okan et al., 2021), meaning that it is constructed through ongoing and well-ordered experiences in health concepts across multiple grade levels, rather than in single lessons or through single subject exposure. The developmental perspective has implications for curriculum design because if a health topic is introduced and never discussed again, or even made more complex, then there is little opportunity for meaningful literacy to be planted in the curriculum. This has been operationalized in programs like HealthLit4Kids in Australia, where the concept of embedding health literacy in the whole-school environment has been implemented, rather than only in one subject, with health literacy being reinforced throughout the school to produce more lasting and lasting effects than fragmented coverage (Nash et al., 2018).

Science education has become a field of particular interest for this integration since it has a similar epistemological, methodical, and learning process-based orientation as health literacy; learners need to be able to think critically about information in science and apply reasoning to real-world decisions (Paakkari & Okan, 2020). But comparative curriculum research warns that content does not always easily fit into science curriculum frameworks. A cross-national exploration of the five national curriculum frameworks (Ghana, Kenya, Kuwait, Estonia and Australia) identified a shared disciplinary structure where science curricula had broadly similar disciplinary structures across countries, yet health-related content was located, sequenced and focused in ways that significantly varied in relation to local disease burdens and policy agendas (Morrish & Neesam, 2021). The finding is important for the current study as it indicates that the extent of coverage of health content should not be taken for granted based on a country's science standards but should be examined empirically at the level of the curriculum.

Content Analysis as a Methodological Approach to Curriculum and Textbook Research

Content analysis has been a proven technique for systematically investigating the level and distribution of attention to specific themes within curricula and textbooks across grade or chapters, or content strands. Recent uses of the approach to health-related themes demonstrate its versatility and ability to uncover curricular imbalances which are not apparent from a superficial examination of standards documents. A large scale systematic content analysis of officially approved textbooks in secondary schools, for example, identified over 1,400 nutrition-related references in 164 textbooks, which were distributed unevenly across grade bands with meaningfully fewer references in upper secondary level textbooks than in lower secondary level textbooks. A content analysis of grade 9 science textbooks from China and Egypt was conducted using a structured coding system, with a comparison of structural and content differences that had direct implications for the ability of each curriculum to facilitate conceptual understanding (Metwally et al., 2024). These studies clearly demonstrate that content analysis is not just descriptive; judicious use of content analysis can reveal systematic deficiencies, such as a lack of content from all grades, a lack of content on a certain topic, and the lack of content in accord with the stated curriculum objectives.

Comparative content analysis has also been deployed, in a specific context, to make comparisons between countries in respect to health content in science and biology textbooks. In this study, the concepts of health education presented in biology textbooks in the United States and Singapore were compared, and both countries made more emphasis on diseases and epidemics than other health-related topics, which indicated the international tendency to focus on disease-oriented information, rather than preventive and lifestyle-oriented health information, in textbooks (Aldossari, 2021). The fact that this pattern is instructive to the present study, raises the question of whether a similar imbalance is found in the General Science curriculum in Pakistan, and whether this imbalance is Pakistan-specific or if it is related to the general trend of science curricula worldwide.

The Single National Curriculum and the Pakistani Context

The Single National Curriculum (SNC) was introduced in Pakistan in 2022, which is an ambitious step to unifying the education system that has been fragmented for centuries across the public, private, and religious (Deeni Madaris) streams of schooling, under one and the same strands, standards, benchmarks and student learning outcomes (SLC) (Farooq et al., 2022). Presently, the SNC has been evaluated in terms of its structural coherence, its correlation with national assessment tools, along with its coverage of religious and social aspects of the curriculum; for instance, a content-based study revealed that the SNC was well-structured, appropriately distributed by subject across grade levels, and adequately weighted by assessment according to the medium of instruction (Farooq et al., 2022), and a cross-curricular study of Grade 5 textbooks analyzed the representation and distribution of religious content in the curriculum (Tayyab et al., 2022). These studies show that the SNC has received some form of scholarly attention since its implementation, but they also show that there is a gap because no evaluation has explicitly and systematically studied the distribution, sequencing, and emphasis on the human health care content in the General Science curriculum at the elementary level.

This is a hard-sell in the health environment in which the schooling of Pakistan's school-going children is taking place. National education statistics also show that a significant percentage of children under 5 in Pakistan are stunted due to malnutrition, which has direct implications for their cognitive development and school readiness (Pakistan Institute of Education, 2024), and that recent intervention research in Pakistan reveals a lack of awareness in adolescents regarding adopting protective health behaviours around non-communicable disease risk (Khan et al., 2025). Programs like the School eHealth Education Program Pakistan (eSHEPP) have been designed because health education in the classroom was seen as inadequate, and these programs have been conducted thus far, outside of the formal science curriculum (Khan et al., 2025). These findings collectively point to both well documented health vulnerabilities among Pakistani adolescents and a formal education system that does not have documented health content that has not yet been independently verified through systematic curriculum analysis.

Research Gap

The literature reviewed herein makes three points clear: Health literacy is best promoted when the content is purposefully organized, presented, and reinforced over grade levels, instead of presented as stand-alone topics (Okan et al., 2021; Vamos et al., 2020). Second, content analysis is a methodologically sound and widely adopted tool for assessing whether curricula and textbooks are meeting the stated health-related objectives and such an analysis often highlights the very well documented imbalances in the curriculum, such as too much focus on disease and not enough on prevention (Aldossari, 2021; Metwally et al., 2024). Third, the structure, assessment alignment of SNC (2022) and religious content have already garnered scholarly interest, however there has been no study that systematically applies a content analytic lens specifically to human health care coverage when reading the General Science curriculum of Grades 6–8 in the context of Pakistan (Farooq et al., 2022; Tayyab et al., 2022). This is a sensible and timely gap, as documented child health vulnerabilities in Pakistan and the limitations in the delivery of school-based health education education acknowledge is an area that requires attention. The current study tackles this challenge directly by systematically analyzing the content of the SNC (2022) General Science curriculum to identify the extent to which human health care content is represented and sequenced in the elementary grades.

Research Design

This study is a qualitative research, using the content analysis method. Content analysis is highly appropriate for the study of curriculum and textbooks as it helps to identify, classify and explain specific content in instructional materials systematically (Krippendorff, 2018). A content analysis is a research method used to draw inferences from texts that are replicable and valid to the context of their use, as

described by Krippendorff (2018). The technique is used to identify the level, type and presence of human health care in the General Science textbooks of Grades 6, 7 and 8 based on the Single National Curriculum (SNC, 2022) of Pakistan.

Population of the Study

The population of the study is all the teaching models of general science in elementary grade (6th to 8th) developed under the single national curriculum (2022) for general science textbook in Pakistan. The books are officially approved by the concerned curriculum and textbook boards and prescribed in public, private and Deeni Madaris schools throughout the country.

Sample and Sampling Technique

The sample used in this study was purposive sampling technique. The purpose of the research was to locate documents most representative of the population of interest, and not to sample a random subset, making it appropriate for this study to be conducted using purposive sampling (Palinkas et al., 2015). Therefore, the sample was purposively selected, which included the officially approved General Science textbooks for Grade 6, Grade 7 and Grade 8 published under SNC (2022). The selection was based on two criteria: (a) the textbooks cover the entire science curriculum for the elementary grades, and (b) the textbooks are the present, officially adopted editions in use during the time the data was collected, so that the results represent the actual curricula in use and not a superseded version.

Research Instrument

The main instrument in this study was content analysis checklist developed by the researcher based on the relevant literature and SNC (2022) curriculum guidelines. Content analysis is a systematic and objective approach to the analysis and interpretation of the content of documents and educational materials (Berelson, 1952; Krippendorff, 2018). The checklist was broken down into five categories of content for human health care, which were predetermined:

- Personal hygiene
- Food and healthy diet
- Disease prevention
- Human body systems
- Health and lifestyle practices

These categories were used to analyze each textbook to identify content, amount and level of coverage for human health care. The checklist was pretested with [subject/curriculum] experts before the data collection to enhance the content validity of the instrument and the changes were made in the instrument according to their suggestions.

Data Collection Procedure

The researcher conducted the systematic review of the selected General Science textbooks from Grades 6, 7, and 8, and analysed chapter-wise and topic-wise in the textbooks for the content of human health care. Content that was relevant was highlighted, coded and recorded on the checklist under the relevant thematic category. To ensure accuracy and consistency, textbooks were re-read during a second coding pass and the identified content was cross-checked with the first coding pass.

Data Analysis Technique

Thematic content analysis was used to analyse the data. The content on health was grouped into the five pre-determined themes and examined in terms of breadth (range of sub-topics covered), depth (level of detail and conceptual complexity), and developmental progression across grade levels. A comparison of the coverage within the grades (6, 7, and 8) was also completed to find similarities/differences and to determine continuity (or discontinuity) across each grade level. This strategy allowed patterns, gaps and vertical progression to be identified in human health care content across the general science curriculum in the elementary grades.

RESULTS

Human Health Care Content Coverage in SNC (2022) General Science Textbooks (Grades 6–8)

The General Science textbooks used in grades 6 to 8 in SNC cover 4.1 Human Health Care. The profile of three official textbooks of General Science (Khyber Pakhtunkhwa Textbook Board) analyzed under the Single National Curriculum (2022) is given in Table 1.

Table 1

Profile of Analyzed Textbooks

Grade	Total Pages	Total Chapters	Publisher
6	173	12	Khyber Pakhtunkhwa Textbook Board, Peshawar
7	186	12	Khyber Pakhtunkhwa Textbook Board, Peshawar
8	209	12	Khyber Pakhtunkhwa Textbook Board, Peshawar

Content analysis was carried out in five predefined categories of content in human health care; Personal Hygiene, Food and Healthy Diet, Human Body Systems, Disease Prevention, and Health and Lifestyle Practices, with each category receiving a score of 0-3 per grade. The coverage scores of the categories and grades are summarized in Table 2.

Table 2

Category-wise Coverage of Human Health Care Content across Grades 6-8

Category	Grade 6	Grade 7	Grade 8	Total (/9)	%
Personal Hygiene	1	1	2	4	44
Food and Healthy Diet	3	0	2	5	56

Human Body Systems	3	3	3	9	100
Disease Prevention	2	3	2	7	78
Health and Lifestyle Practices	1	1	2	4	44
Grade Total (/15)	10	8	11	29/45	64
Grade %	67%	53%	73%	—	—

The overall human health care content coverage in the elementary General Science curriculum was moderate with an average of 64% for the three grades. There was not a linear, but rather an uneven trend across the elementary grades as coverage was highest in Grade 8 (73%) and lowest in Grade 7 (53%).

Table 3

Location and Nature of Coverage by Category and Grade

Category	Grade 6	Grade 7	Grade 8
Personal Hygiene	Ch. 3 (pp. 23-36); Ch. 4 (pp. 37-44) embedded within clean water/food safety discussion; not a distinct topic	Ch. 3 (p. 36) minimal, lacks practical application	Ch. 7 (p. 102); Ch. 11 (pp. 170-171) tooth care, use of soap/toothpaste, with simple activities
Food and Healthy Diet	Ch. 3 (pp. 23-6) nutrients and balanced diet explained in detail	Not addressed	Ch. 1 (p. 8); Ch. 4 (pp. 46-49) healthy food, digestive bacteria, and biotechnology in nutrition briefly introduced
Human Body Systems	Ch. 4 (pp. 37-44) digestive system, supported by diagrams	Ch. 2 (pp. 15-28) clear conceptual coverage	Ch. 2 (pp. 17-30) nervous system, detailed with diagrams and activities
Disease Prevention	Ch. 4 (pp. 37-44) via digestive disorders; limited depth	Ch. 3 (pp. 29-40) causes, prevention, vaccination, first aid, hygiene explained in detail	Ch. 4 (pp. 51-52); Ch. 6 (pp. 86-91); Ch. 7 (pp. 102-106) vaccines, insulin, basic first-aid examples

Health and Lifestyle Practices	Ch. 3 (pp. 23-36) limited to healthy eating and fitness	Not addressed, despite curricular relevance	Ch. 2 (p. 27); Ch. 10 (p. 159) exercise, stress reduction, electrical safety
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Pattern of Coverage

All 3 grades were covered in every category with Human Body Systems being the most consistently covered theme from the curriculum. The coverage for Disease Prevention was relatively high overall with almost all of the coverage in Grade 7 and lighter treatment in Grade 6 and 8. Personal Hygiene and Health and Lifestyle Practices exhibited the lowest levels of achievement in all three grades (4/9 at each grade level), and neither theme achieved a full score, suggesting that they do not receive a strong focus in the curriculum but are treated as a side issue. The only pattern that was not fully consistent was for Food and Healthy Diet where there was no content covered in Grade 7 and then full coverage in Grade 8, a discontinuity that disrupts the vertical flow of content through the elementary sequence.

DISCUSSION

The results show that, although human health care content was present in the SNC (2022) General Science textbooks for Grades 6-8, it is not evenly distributed and averaged 64 percent overall with scores fluctuating but not moving in a linear pattern across the grades (67 percent at Grade 6, 53 percent at Grade 7, and 73 percent at Grade 8). The lack of a logical sequence, especially the complete lack of Food and Healthy Diet content in Grade 7, indicates that health themes are included in an ad hoc manner, instead of following a specific developmental sequence, as found internationally where health messages are often placed in non-cumulative, albeit in a variety of ways (Morrish & Neesam, 2021; Okan et al., 2021; Vamos et al., 2020). The robust and solid treatment of Human Body Systems (100% in all grades) is striking compared to the treatment of Personal Hygiene and Health and Lifestyle Practices, which received weak and peripheral treatment in every grade, as noted by Aldossari (2021), where anatomy-oriented content is easily incorporated into conventional science pedagogy, but behavior-oriented health themes, such as hygiene, mental health, sleep, and screen time, demand a different pedagogical approach that is often not integrated into the science curriculum in science textbooks. The tendency of the SNC to embed hygiene within unrelated topics and not to be a standalone strand also reflects how the organizational choices in textbooks influence the conceptual depth of medicine as a whole (Metwally et al., 2024). Disease Prevention was comparatively well covered, particularly in Grade 7, which is similar to the common international approach of embedding disease-related content throughout science lessons, as it is linked to biological processes (Morrish & Neesam, 2021); however, the focus on a single grade level and not as a consistent theme throughout the three grades indicates that the exposure of this topic is not as sustained as expected and recommended for long-term health literacy (Nash et al., 2018). In the Pakistani context, the possibility of these gaps is a consequence of documented child health vulnerabilities like malnutrition linked stunting (Pakistan Institute of Education, 2024) and acknowledged gaps of didactic curriculum-external health education efforts (Khan et al., 2025) indicating that the General Science curriculum is yet to become the main vehicle for health literacy development as envisioned in international frameworks (Paakkari & Okan, 2020). Despite the moderate-to-strong performance in the Human Body Systems and Disease Prevention standards, the science dimensions of the human body (currently well represented under these standards) are not being connected to the behavioral and lifestyle aspects of health that these standards do not currently cover, which is the primary gap.

CONCLUSION

The purpose of this study was to explore the coverage of human health care knowledge in the General Science textbooks of Grades 6 to 8 as provided in the Single National Curriculum (2022) of Pakistan,

which revealed that the coverage is moderate to moderate, not consistently at a higher level as the learners advance to the elementary level of schooling, but rather varies from 67% in Grade 6 to as low as 53% in Grade 7 and then rises to 73% in Grade 8. Human Body Systems was the most consistently and extensively addressed category, earning full marks from all grade levels, indicating that the health curriculum is well suited to address health content that closely resembles the traditional scientific model of explanation, structure, and diagrams. By contrast, the categories of Personal Hygiene and Health and Lifestyle Practices were the weakest and most poorly developed across all three grades, often present only in passing in topics that seemed to have nothing to do with them, and Food and Healthy Diet showed a disturbing discontinuity: it was well covered in Grade 6, but was absent in Grade 7 and only semi-reappeared in Grade 8. Overall, Disease Prevention was well covered, but it was overrepresented in just one grade and not strengthened as learning proceeded. The findings as a whole indicate that the SNC (2022) General Science curriculum for Grades 6-8 is adequate in providing a scientific foundation for health-related learning, but is inadequate in its ability to provide a coherent, developmentally sequenced program of health education that covers the practical, behavioral, and lifestyle aspects of health that are most important for students' daily wellbeing. As the health risks faced by school children in Pakistan have been documented in the literature and the lack of consistency and balance observed in the study, curriculum developers are recommended to revisit the sequencing, depth and balance of the human health care content in the elementary General Science textbooks in order to ensure that a similar and systematic approach is given to hygiene, nutrition and lifestyle related themes, as is done for the content of body systems and diseases.

RECOMMENDATIONS

Based on the results of this study, the following suggestions are made for curriculum developers, textbook writers and education policy makers who are responsible for the General Science curriculum in the Single National Curriculum (2022):

- **Introduce self contained topic of Personal Hygiene.** Each grade level textbook should have a unit or sub-section that focuses on the importance of personal hygiene (handwashing, oral care, bathing and nail/hair care) with step-by-step pictures and activities relevant to the grade level.
- **Improve and standardize the Food and Healthy Diet content** for all three grades. Grade 7 has no trace of this theme; this is the end of the learning sequence developed in Grade 6, and only partially introduced again in Grade 8. Nutrition content should be included in every grade, building upon each as they go, so that it is reinforced throughout the year.
- **Develop Health and Lifestyle Practices to incorporate current issues.** Awareness of mental health issues, impact of screen time, sleep hygiene, and avoiding risky behaviors (e.g., substance use) will generally not be in the curriculum in all three grades and should be introduced with age-appropriate examples as these are directly related to students' wellbeing in their daily lives. Don't centralise
- **Reinforce Disease Prevention content across all grades.** Grade 7 offers good coverage of disease causes, prevention and first aid but this level of coverage should be carried over and deepened in Grades 6 and 8, with disease being revisited and reinforced as it is taught.

Future Research Recommendations

- Extend the analysis to secondary and higher secondary levels. Future studies should look at the content coverage of human health care in SNC textbooks in grades 9-12 to see if identified gaps continue, increase or are addressed in later grades.

- Include teacher or student points of view. Future research might also involve surveying or interviewing science teachers and students to determine the extent to which health-related content is taught, understood and implemented in classroom practice, in addition to being identified in written text.
- Compare curriculum materials at the provincial/regional level. As education boards have some provincial variations in their operations, future studies are required to compare the coverage of topics related to human health in books published by the Khyber Pakhtunkhwa Textbook Board with other provincial textbooks boards to find out if the patterns found in this study are specific to the Khyber Pakhtunkhwa Textbook Board or can be attributed to the national curriculum as a whole.
- Investigate the effects of gaps in the curriculum on student health behaviors and literacy outcomes. Future research could take either a quantitative or a mixed-methods approach to determine if the gaps in hygiene, nutrition, and lifestyle content is associated with a measurable gap in students' actual health literacy, knowledge, attitudes, or behaviors, thereby providing a stronger evidentiary link between curriculum content and real-world health literacy.

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