

RESEARCH

Open Access



Content analysis of health-related subjects in the K12 school curricula of Japan, Indonesia, Philippines, Guam, Micronesia, Marshall Islands, Palau, and Fiji

Akihiro Nishio^{1,2,3*} , Fumiko Shibuya^{2,3}, Calvin S. de los Reyes^{2,4}, Crystal Amiel M. Estrada^{5,6}, Ernesto R. Gregorio Jr^{6,7}, Dian Puspita Sari⁸, Cut Warnaini⁸, Hamsu Kadriyan⁸, Maria Sandra M. Cruz⁹, Margaret Hattori-Uchima⁹, Paul Dacanay¹⁰, Rudelyn Dacanay¹⁰, Hillia Langrine Enos¹¹, Tarmau Terry Ngirmang¹², Mohamed Khalif¹³, Saula Golea Volavola¹⁴, Sachi Tomokawa¹⁵, Mika Kigawa¹⁶ and Jun Kobayashi^{2,3}

Abstract

Background As a component of health promoting school, a school curriculum for health education was considered a fundamental. This survey aimed to identify the components of health-related topics and in which subjects were they taught.

Methods Four topics were chosen: (i) hygiene, (ii) mental health, (iii) nutrition-oral Health, and (iv) environmental education related to global warming in Education for Sustainable Development (ESD). Before gathering the curricula from partner countries, school health specialists were gathered to discuss the appropriate components of a curriculum that required evaluation. The survey sheet was distributed to and answered by our partner in each country.

Results About hygiene, individual practices or items that improve health-related were widely covered. However, items that imparted health-related education from an environmental perspective were not widely covered. About mental health, two types of country groups were identified. The first group included countries that taught mental health topics mainly as part of morals or religion; the second group included countries that imparted mental health topics mainly as part of health. The first group focused mainly on communication skills or coping methods. The second group focused not only on communication and coping skill but also on basic knowledge of mental health. About nutrition-oral education, three types of country groups were identified. One group imparted nutrition-oral education mainly in terms of health or nutrition. Another group imparted this topic mainly in terms of morals, home economics, and social science. The third group was the intermediate group. About ESD, a solid structure for this topic was not identified in any country. Many items were taught as part of science, while some were taught as part of social studies. Climate change was the most commonly taught item across all countries. The items related to environment were relatively limited compared to those related to natural disasters.

*Correspondence:

Akihiro Nishio

akio13e@yahoo.co.jp

Full list of author information is available at the end of the article



© The Author(s) 2023. **Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

Conclusions Overall, two different approaches were identified: the cultural-based approach, which promotes healthy behaviors as moral codes or community-friendly behaviors and the science-based approach, which promotes children's health through scientific perspectives. Policymakers should initially consider the findings of this study while making decisions on which approach should be taken.

Keywords Health education, Curricula, School, Hygiene, Mental health, Nutrition, Education for sustainable development (ESD)

Background

Children and adolescents spend most of their time in schools. Thus, promoting healthy behavior from early childhood through the school setting can directly benefit children. The World Health Organization (WHO) defines a health promoting school as “a school that is constantly strengthening its capacity as a healthy setting for living, learning and working.” Health promoting schools (HPS) have been recognized as strategic vehicles to not only promote positive development and healthy behaviors such as physical activity, physical fitness, recreation, play, and balanced nutrition but also prevent tobacco use, bullying, and aggressive behavior [1]. The systematic survey assessed the impacts of HPS among low- and middle-income countries in Western Pacific Region and stated that all eight identified studies showed significant knowledge and attitudes changes [2]. Nowadays, HPS is considered a fundamental value to promote children's health. To enhance HPS, the WHO launched eight Global Standards on Health Promoting Schools in 2021 [3]. These eight global standards aim at the progressive realization of HPS and cover (i) government policies and resources, (ii) school policies and resources, (iii) school governance and leadership, (iv) school and community partnerships, (v) school curriculum, (vi) school social environment, (vii) school physical environment, and (viii) school health services. Among these eight standards, a school curriculum for health education was considered a fundamental part of an overall school health program. It provides young people with the knowledge and skills they need to become successful learners and healthy and productive adults. Choosing or developing a well-structured health education curriculum which covers widely essentials components is a critical step in ensuring that health education effectively promotes healthy behaviors. The curriculum selection or development process, however, can lack structure and focus, which can result in choosing or developing curricula that are inadequate or ineffective.

EDU-Port Japan, supported by the Ministry of Education, Culture, Sports, Science and Technology, Japan, is a “public-private, nationwide” initiative to provide a platform in which the public and private sectors collaborate to achieve global education projects. The “Research Project for promoting Japanese-style Education Amidst the COVID-19 Pandemic (EDU-Port Japan 2.0)” began in 2021. The EDU-Port Japan

project, organized by the University of the Ryukyus, held an online consultation workshop on healthy and safe schools for the post-COVID-19 era in the Asia-Pacific Islands on January 26, 2022, in cooperation with WHO, Western Pacific Regional Office. The University of the Ryukyus had a partnership with the University of the Philippines-Manila, Mataram University from Indonesia, and the University of Guam. This survey was a part of multiple surveys of the Eduport projects. Other surveys focused on COVID-19 managements at schools, and several countries reports about school health. This study aims to provide basic information on school health among the targeted countries.

The COVID-19 pandemic has had a major impact on children's health and education in the Asia-Pacific region after the SARS-CoV-2 delta variants began spreading globally. This has resulted in an increased risk of infection in schools and adverse mental health among children due to abuse not only at home but also online as a result of the prolonged school closures and the economic impact on families and communities. In addition, the risk of life-style-related diseases has also increased due to decreased physical activity. The importance of education regarding proper mental health and nutrition may be reconfirmed among educational and health experts in the region [4]. The increase in the incidence of emerging infectious diseases may be due, in part, to the rapid expansion of human settlements in recent years, which has resulted in greater instances of human-wildlife conflict. Because this is also related to the issue of global warming, it is necessary to systematically study the relationship between the environment and health [5]. Therefore, in this study, we will focus on hygiene, mental health, nutrition-oral health, and environmental education related to global warming. Since the curricula are not so flexible to be changed during the pandemic. Thus, this survey is considered as a baseline survey. By identifying the similarities and differences in the content of the curricula, we hope to make recommendations on how to improve the curriculum in each country.

Methods

Development of questionnaires

Before gathering the curricula from partner countries, school health specialists were gathered to discuss the

appropriate components of a curriculum that required evaluation. All five specialists belonged to the Japanese school health consortium and worked in their own field for school health implementation. The following four topics were chosen: (i) hygiene, (ii) mental health, (iii) nutrition-oral Health, and (iv) environmental education related to global warming in Education for Sustainable Development (ESD). To develop the items of the curriculum survey, global guidelines were considered, if available. Other items were added by the specialists. Since we could not find a global standard of mental health curriculum, the “Guideline of African School Mental Health Curriculum” [6] and “Mental Health and High School Curriculum Guide (Version 3)” [7] were referred to as standards of the mental health curriculum. The agenda of “UN food Systems Summit in 2021” [8] and the article of “Health-promoting schools: an opportunity for oral health promotion” which was published in Bulletin of the World Health Organization [9] were used as global standards of the nutrition-oral health curriculum. A global standard of hygiene education could not be found. Since ESD is a concept that can be integrated into any subject, only components related to natural disasters and the environment were selected for this survey. The items were modified each time after initial meetings with partner countries. The subjects that contained these items were determined for primary, secondary, and high school curricula. The survey sheet was distributed to and answered by our partners in each country. Online meetings were repeatedly held and some items were revised in this step.

Since the names of subjects varied, they were classified into the following large categories: language (foreign language and local language), science, social studies, health, morals, religion, nutrition, home economics, physical education (PE), and integrated study. The definition of each item was elaborated to be understood clearly by participants during the survey. Table 1 depicts the final version of the items of this survey that was conducted from October 2021 to October 2022. This survey analyzed the published curricula of the countries. Table 2 shows the data sources of curricula of each country. The approval of ethical committee was not required.

Targeted countries

Initially, the curricula of Japan, Indonesia, the Philippines, and Guam were analyzed in 2021. The result was shown in the online consultation workshop “Healthy and Safe Schools for the Post-COVID-19 Era in the Asia-Pacific Islands” which was held on January 26, 2022. The invitation letters for this workshop were sent to all Western Pacific Islands. The further expansion of the targeted countries was discussed at the workshop. Finally,

the participants who belonged to the Federated States of Micronesia (FSM), Marshall Islands, Palau, and Fiji agreed to join in our survey. Thus, this survey was conducted for Japan, Indonesia, Philippines, and Guam in 2021 and for Micronesia, Marshall Islands, Palau, and Fiji in 2022.

Results

Hygiene

Overall, individual practices or items that improve health-related were widely covered. However, items that imparted health-related education from an environmental perspective were not widely covered.

The results are depicted in Table 3. Only FSM did not have a hygiene-related curriculum. Palau’s hygiene-related curriculum comprised just one page and was thus, very limited. Apart from these two countries, hygiene-related curricula were widely covered in primary school. In Fiji, hygiene-related topics were taught as part of moral studies in early primary school before transitioning to topics related to health in later primary school. Hygiene-related topics were more likely to be taught in primary schools than in high schools in all countries. Individual practices such as “handwashing with soap,” “maintaining physical cleanliness,” and “maintaining the cleanliness of clothes” or items that improve health-related knowledge such as “prevention of injury,” “first-aid treatment,” “the concept of health and the causes of disease,” and “infectious diseases” were widely covered in all countries, except FSM and Palau. However, items that imparted health-related education from an environmental perspective such as “clean water,” “garbage problem,” and “pollution of the air, land, water, etc.” were not widely covered.

Mental health

The results are depicted in Table 4. Two types of country groups were identified. The first group included countries that taught mental health topics mainly as part of morals or religion; the second group included countries that imparted mental health topics mainly as part of health. Japan and Indonesia belonged to the first group, while the remaining countries belonged to the second group. Only FSM did not have a subject that widely covered mental health-related topics. The first group focused mainly on communication skills such as “mutual understanding among peers,” “communication with family members,” “seeking help and finding support,” and “managing conflict” or coping methods such as “self-awareness,” “management of emotions,” “stress management and coping,” and “positive mental health.” The second group focused not only on communication and coping skill but also on basic knowledge of mental health such as

Table 1 Items of the school health curriculum survey

Hygiene	Mental health	Nutrition-oral health	Education for sustainable development (ESD)
Handwashing with soap	Basic understanding of mental health or mental illness (described mentally good/bad status and reasons that lead to bad mental status)	Safety of foods	Climate change/global warming
Maintaining physical cleanliness (shower, haircut, etc)	More specific knowledge of mental illness (mental illness are clearly mentioned and explained)	Food supply system	A rise in sea level
Maintaining cleanliness of clothes	Understanding mental developmental stage (basic knowledge of mental developmental stage of human being. Just development of body is excluded)	Healthy eating	Glacial retreat
Ensuring environmental hygiene (house, room, toilet, etc)	Mutual understanding among peers	No sugar	Heatwaves
Ventilation of rooms	Communication with family members (the relationship between health and family is clearly mentioned)	No alcohol	Droughts
Hygienic management of food and cooking utensils	Seeking help and finding support	No smoking	Flooding
Prevention of injury	Self-awareness (personality or sense of value is mentioned. Self assessment for educational goal is excluded)	Oral health education	Winter storms
First-aid treatment	Management of emotions (in the meaning of avoiding conflicts. Concentration on learning is excluded)	Basic cooking skills	Hurricanes
The concept of health and the causes of disease	Stress management and coping	Handling of cooking facilities, cooking utensils and tableware	Wildfires
Infectious diseases	Managing conflict	Food culture (relationship between local food, local society, and natural condition)	
Menstrual hygiene	Positive mental health (ways for boosting good mental health are clearly mentioned. Simple exercise or physical activity is excluded)	Respect to life of animals and plants	
Clean water	Stigma toward mental illness		
Garbage problem			
Pollution of the air, land, water, etc			

This table describes the items and their definition of the health-related components of curricula

Table 2 Data sources of curricula of each country

Country	Curriculum	Curriculum from online database
Japan	Ministry of education, culture, sports, science and technology— Japan curriculum	https://www.mext.go.jp/a_menu/shotou/new-cs/1384661.htm
Indonesia	Indonesian curriculum	https://www.futureschool.com/indonesia-curriculum/
Philippines	K to 12 Basic education curriculum	https://www.deped.gov.ph/k-to-12/about/k-to-12-basic-education-curriculum/
Guam	Curriculum and Instruction	http://guam.cyberschool.com/District/Department/5-Curriculum-Instruction/Portal/resource-page
Palau	Ministry of Education Syllabus	Not available online
FSM	Pnhnpei department of education curriculum frameworks 2009	https://national.doe.fm/index.php/ndoe-public/education-documents/education-curriculum-and-slo/496-science-curriculum
	National curriculum standards and benchmarks DOE 2008	https://national.doe.fm/index.php/ndoe-public/education-documents/education-curriculum-and-slo/
	National curriculum standards and benchmarks DOE 2008 (CHUUK EDUCATION REFORM)	https://national.doe.fm/PublicDocuments/Education%20Strategic%20Plans/ChuukDOE-Reform-Plan-2011-to-2015-Final.pdf
Marshall Islands	MOE Curriculum (K-12)	http://katakcenter.org/moe_docs.html#
Fiji	The Fiji Islands National Curriculum Framework	http://www.paddle.usp.ac.fj/collect/paddle/index/assoc/fj33.dir/doc.pdf
	Ministry of Education Heritage and Arts	https://www.futureschool.com/fiji-curriculum/#top

This table shows the online sources of curricula of each country. The online source was not available only in Palau

“basic understanding of mental health or mental illness” and “understanding of mental developmental stage.” Although the stigma toward mental illness may be one important component, this aspect was not independently elaborated by any country. “More specific knowledge of mental illness” was imparted only to middle-school students in the Philippines. In Indonesia, some items were taught as part of the language. Moreover, the timing and components of mental health-related items depended on students’ religions. In the Philippines, mental health-related items shifted from health subjects in primary and middle schools to moral subjects in high schools.

Nutrition-oral education

The results are depicted in Table 5. The items related to nutrition-oral education were taught mainly as part of health, home economics, and social studies. “Healthy eating” was the most common item and was taught in all countries, except FSM. “Food culture” was also common and was taught mainly as part of health or social studies in all countries, except Indonesia and Palau. “Oral health education” was taught in all countries, except FSM and Palau. In general, this topic was more likely to be taught in primary schools than in high schools. Three types of country groups regarding nutrition-oral education were identified. One group, which included the Philippines, the Marshall Islands, and Fiji, imparted nutrition-oral education mainly in terms of health or nutrition. Another group, comprising Japan and FSM, imparted this topic mainly in terms of morals, home economics, and social science. The third group was the intermediate group

comprising Indonesia, Guam, and Palau. “Healthy eating” was the most commonly discussed item, followed by “food culture.”

Environmental education related to global warming in education for sustainable development (ESD)

The results are depicted in Table 6. “Climate change” was the most common item and was taught to middle-school students in all countries mainly as part of science or social studies. Fiji taught all of the contents of ESD as part of health. The items related to the environment were relatively limited compared to those related to natural disasters. As with other topics, some of the items were taught as part of language in Indonesia.

Discussion

Overall, basic components that enhanced individual hygienic practices and knowledge of hygiene were generally taught in partner countries, except FSM and Palau. However, environmental-related items such as “clean water,” “garbage problem,” and “pollution of the air, land, etc.” were not widely taught. Hygienic actions being promoted at schools are shifting from individual behaviors to environmental activities these days [10–12]. The hygiene-related topics may be elaborated again from the environmental perspective.

About the subjects related to mental health, two trends were identified. One was that while some countries (Japan and Indonesia) taught this topic in terms of morals or religion (However, Japan introduced a new curriculum on mental health in 2022. Since this survey was

Table 3 Hygiene-related items in the curricula

Target	Subcategory	Items of curricula	Japan	Indonesia	Philippines	Guam	FSM	Marshall Islands	Palau	Fiji
Primary School	Individual practices	Handwashing with soap	Health	Language Social studies	Health	Health	Health	Health	Health	Health
		Maintaining physical cleanliness (shower, haircut, etc.)	Health	Health and PE Religion (Is, Ca, Ko)	Health Home economics	Health	Health	Health	Health	Health
Housing		Maintaining cleanliness of clothes	Home economics	Health and PE Language	Home economics Health	Health	Health	Health	Health	Health
		Keeping environmental hygiene (house, room, toilet, etc.)	Science Home economics	Religion (Is, Ca) Health and PE	Health Health	Health	Social studies	Social studies	Moral	Moral
		Ventilation of rooms	Home economics	Language Social studies	Home economics	Health	Health	Health	Health	Health
		Hygienic management of food and cooking utensils	Home economics	Home economics	Home economics	Home economics	Home economics	Home economics	Home economics	Home economics
Knowledge of hygiene		Prevention of injury	Science	Health and PE	Health	Health	Health	Health	Health	Morals Health
		First-aid treatment	Health	Health and PE	Health	Health	Health	Health	Health	Health
		The concept of health and the causes of disease	Science Health	Language Science	Health Health	Health	Health	Health	Health	Morals Health
Environment		Infectious diseases	Health	Health and PE	Health	Health	Health	Health	Health	Health
		Menstrual hygiene		Health and PE	Health	Health	Science	Science	Health	Health
		Clean water		Health and PE	Health	Health	Science	Science	Morals	Morals
		Garbage problem		Language Social Studies	Health	Health	Health	Health	Health	Health
		Pollution of the air, land, water, etc			Health Home economics	Science	Science	Health	Health	

Table 3 (continued)

Target	Subcategory	Items of curricula	Japan	Indonesia	Philippines	Guam	FSM	Marshall Islands	Palau	Fiji
Middle School	Individual practice	Handwashing with soap				Home economics				Health
		Maintaining physical cleanliness (shower, haircut, etc.)		Religion (Is, Bu)		Health			Health	Health
	Housing	Maintaining cleanliness of clothes	Home economics	Religion (Is, Bu)		Health		Health		
		Keeping environmental hygiene (house, room, toilet, etc.)	Home economics	Social studies		Health		Health		Health
		Ventilation of rooms								Health
		Hygienic management of food and cooking utensils	Home economics			Home economics		Nutrition		
	Knowledge of hygiene	Prevention of injury	Home economics	Health and PE	Health				Health	Health
		First-aid treatment	Health		Home economics					Health
			Health	Health and PE	Health					
		The concept of health and the causes of disease	Health	Health and PE	Health			Health	Health	Health
		Infectious diseases	Health		Health			Health		Health
		Menstrual hygiene								Health
	Environment	Clean water			Health			Health		Health
		Garbage problem			Health			Health		Health
		Pollution of the air, land, water, etc			Health			Health		Health
								Science		

Table 3 (continued)

Target	Subcategory	Items of curricula	Japan	Indonesia	Philippines	Guam	FSM	Marshall Islands	Palau	Fiji
High School	Individual practice	Handwashing with soap		Health and PE		Home economics				
		Maintaining physical cleanliness (shower, haircut, etc.)		Health and PE		Health		Nutrition		
	Housing	Maintaining cleanliness of clothes	Home economics							
		Keeping environmental hygiene (house, room, toilet, etc.)	Home economics	Health and PE				Health		
		Ventilation of rooms								
		Hygienic management of food and cooking utensils	Home economics		Home economics	Home economics				
	Knowledge of hygiene	Prevention of injury	Health	Health and PE	PE	Health				
		First-aid treatment	Health		Home economics			Health		
		The concept of health and the causes of disease	Health	Health and PE				Health		
		Infectious diseases	Science	Science		Health		Health		
		Menstrual hygiene	Health							
	Environment	Clean water								
		Garbage problem		Science	Home economics					
		Pollution of the air, land, water, etc		Science						
				Social studies						

FSM did not have any curriculum which educated hygiene-related items. Individual practices and health-related knowledge were widely covered in many countries. However, environmental items were not widely covered

Is Islam, Cr Catholicism, Cr Christianity, H/ Hinduism, Ko Confucianism, Bu Buddhism

Table 4 Mental health-related items in the curricula

Target	Subcategory	Items of curricula	Japan	Indonesia	Philippines	Guam	FSM	Marshall Islands	Palau	Fiji	
Primary school	Knowledge of mental health	Basic understanding of mental health or mental illness			Health	Health		Health			
	Communication skill	More specific knowledge of mental illness		Religion (Ch)	Health					Health	
		Understanding mental developmental stage		Science	Home economics						
Coping method	Communication with family members	Mutual understanding with peers	Integrated studies	Religion (Is, Ch, Ca, Hi)	Health	Health		Language	Health	Morals	
		Communication with family members	Morals	Social studies	Health						
	Seeking help and finding support		Morals	Language		Social studies			PE	Health	
			Morals	Religion (Is, Hi, Ko)	Health	Health			Health	Morals	
	Management of emotions			Language			Social studies				Health
				Social studies							
						Health	Health		Health	Health	Morals
				Integrated studies	Religion (Is, Ch, Ca)	Health	Health				
				Integrated studies	Religion (Is)	Health	Health				Health
				Integrated studies							Health
Other	Managing conflict		Integrated studies	Religion (Is, Ch)	Health	Health		Social studies	Social studies	Health	
	Positive mental health		Integrated studies		Health	Health				Health	
	Stigma toward mental illness		Integrated studies								

Table 4 (continued)

Target	Subcategory	Items of curricula	Japan	Indonesia	Philippines	Guam	FSM	Marshall Islands	Palau	Fiji
Middle school	Knowledge of mental health	Basic understanding of mental health or mental illness			Health	Health		Health		Health
		More specific knowledge of mental illness			Health					
Communication skill		Understanding developmental stage	Integrated studies		Health					Health
		Mutual understanding with peers	Integrated studies	Religion (Is, Ch, Hi)	Health			Language	Health	Health
		Communication with family members	Morals	Social studies	Health			Language	Health	Health
		Seeking help and finding support			Health					Health
Coping method		Self-awareness	Integrated studies	Social studies	Health	Health		Language	Health	Health
		Management of emotions		Religion (Is, Ch, Hi, Bu)	Morals	Health				Health
Other		Stress management and coping			Health			Health		Health
		Managing conflict					Social studies	Health		Health
		Positive mental health						Social studies	Health	
		Stigma toward mental illness							Social studies	
Other		Other (violence, bullying)		Health and PE	Morals					Health
		Other (child protection)			Morals					

Table 4 (continued)

Target	Subcategory	Items of curricula	Japan	Indonesia	Philippines	Guam	FSM	Marshall Islands	Palau	Fiji
High school	Knowledge of mental health	Basic understanding of mental health or mental illness			Morals	Health				
		More specific knowledge of mental illness		Religion (Ch)	Morals	Home economics				
Communication skill		Understanding developmental stage		Religion (Ch)	Morals	Health				
		Mutual understanding with peers	Integrated studies	Religion (Ch)	Morals	Health				
		Communication with family members		Religion (Ch, Is)	Morals	Health			Health	
Coping method		Seeking help and finding support				Health				
		Self-awareness	Integrated studies	Religion (Is, Ch)	Morals	Health				
		Management of emotions		Religion (Ch)	Morals	Health				
		Stress management and coping			Morals	Health				
Other		Managing conflict		Religion (Ch)		Health	Social Studies	Social studies		
		Positive mental health							Health	
		Stigma toward mental illness				Morals	Health			
		Other (suicide prevention)		Religion (Ca)						

Japan and Indonesia taught mental health topics mainly as part of morals or religion. Other countries imparted mental health topics mainly as part of health. Only FSM did not have a subject that widely covered mental health-related topics

Is Islam, Ca Catholicism, Cr Christianity, Hf Hinduism, Ko Confucianism, Bu Buddhism

Table 5 Nutrition-oral education-related items in the curricula

Target	Items of curricula	Japan	Indonesia	Philippines	Guam	FSM	Marshall Islands	Palau	Fiji
Primary school	Food security	Morals		Health					Health
	Safety of foods	Home economics							
	Food supply	Social studies		Health		Social studies			Health
		Science		Home economics		Science			
	Healthy food	Home economics	Health and PE	Health	Health		Health	Health	Moral
	Healthy eating	Health and PE	Language	Home economics					Health
	Oral health			Health			Health		
	No sugar		Health and PE	Health			Health		
	No alcohol		Health and PE	Health			Health		
	No smoking		Health and PE	Health			Health		
	Oral health education		Language	Health	Health		Health		Morals
	Cooking skills	Health and PE		Health					
	Basic cooking	Home economics		Health			Social studies		
	Handling of cooking facilities, cooking utensils and tableware	Home economics		Health					Health
	Food culture	Science		Health	Health	Social studies	Social studies		Health
		Morals			Social studies				
		Home economics							
	Respect for food	Science	Social studies	Health					
		Morals							
	Other (avoiding substances abuse)				Health				

Table 5 (continued)

Target	Items of curricula	Japan	Indonesia	Philippines	Guam	FSM	Marshall Islands	Palau	Fiji
Middle school	Food security				Home economics				Health
	Safety of foods				Home economics				Health
	Food supply	Social studies			Home economics	Social studies	Social studies		Health
	Healthy food	Home economics	Science		Health	Science			Health
	Healthy eating		Health and PE		Home economics		Nutrition	Health	Health
	Oral health								Health
	No sugar								Health
	No alcohol			Health					Health
	No smoking			Health					Health
	Oral health education	PE			Health				Health
	Cooking skills	Home economics			Home economics				Health
	Basic cooking						Nutrition		Health
	Handling of cooking facilities, cooking utensils and tableware						Social studies		Health
	Food culture	Social studies			Home economics	Home economics			Health
	Food culture	Home economics					Social studies	Social studies	Health
	Respect for food	Moral education					Nutrition		Health
	Other (additive and addictive substances in food or beverages)		Science				Health		Health

Table 5 (continued)

Target	Items of curricula	Japan	Indonesia	Philippines	Guam	FSM	Marshall Islands	Palau	Fiji
High school	Food security			Home economics	Home economics				
	Safety of foods					Home economics	Nutrition		
	Food supply				Home economics	Social studies			
	Healthy food		Health and PE	Health and PE	Home economics	Science	Health		
	Healthy eating		Science		Health				
	Oral health		Health and PE		Health		Nutrition		
	No sugar		Health and PE		Health		Nutrition		
	No alcohol		Health and PE		Health		Nutrition		
	No smoking		Health and PE		Health				
	Oral health education		Science						
Cooking skills	Basic cooking				Health		Nutrition		
	Handling of cooking facilities, cooking utensils and tableware				Home economics	Home economics	Nutrition		
Food culture	Food culture			Home economics	Home economics	Home economics	Nutrition		
	Respect for food			Social studies		Social studies	Social studies		
Other	Other (substance abuse)		Science		Health				

The items related to nutrition-oral education were taught mainly as part of health, home economics, and social studies. "Healthy eating" was the most common item and was taught in all countries, except FSM

Table 6 (continued)

Target	Subcategory	Items of curriculum	Japan	Indonesia	Philippines	Guam	FSM	Marshall Island	Palau	Fiji
Middle school	Climate change	Climate change/global warming	Science	Science	Health	Science	Science	Science	Science	Health
			Home economics				Social studies	Social studies		
			Integrated studies							
	Natural disaster	A rise in sea level				Science	Science	Science	Science	Health
		Glacial retreat				Science				
		Heatwaves				Science				
		Droughts				Science	Science	Science	Science	Health
		Flooding				Science		Science		
		Winter storms				Science				
		Hurricanes				Science	Science	Science		
		Wildfires				Science		Social studies		
		Other (natural disasters in general)		Science						Health
	Environment	Other (emergency-related drills and training)			Home economics					
		Other (pollution)		Science			Social studies			
		Other (the impact of technology on environment)		Science						
		Other (the impact of population growth)		Science						
		Other (existing global health initiatives)			Health					
		Other (recycling)					Science	Home economics		Health

Table 6 (continued)

Target	Subcategory	Items of curriculum	Japan	Indonesia	Philippines	Guam	FSM	Marshall island	Palau	Fiji	
High school	Climate change	Climate change/global warming	Social studies	Social studies	Science			Science			
			Science	Science			Social studies				
	Natural disaster	A rise in sea level Glacial retreat Heatwaves Droughts Flooding Winter storms Hurricanes Wildfires Other (emergency-related drills and training)	Home economics								
			Science	Science					Science		
						Science					
				Social studies	Science						
				Social studies	Social studies	Science					
				Social studies	Social studies	Science					
				Social studies	Social studies						
				Social studies	Social studies						
Environment	Other (food security and alternative source of energy) Other (environmental protection)			Social studies	Home economics						
				Social studies	Social studies			Health			

"Climate change" was the most common item and was taught to middle-school students in all countries mainly as part of science or social studies

conducted for Japan in 2021, the new curriculum was not assessed in this survey), others taught it in terms of health. The other trend was that communication skills were taught the most widely as mental health education in many countries. Whether the topic of mental health should be included as part of morals, religion, or health subjects may be noteworthy to establish a standardized mental health curriculum. This decision should be made before developing the curricula for the countries wanted to develop the curricula.

Regarding the subjects related to nutrition-oral education, three types of country groups were identified. One group imparted nutrition-oral education mainly in terms of health or nutrition. Another group imparted this topic mainly in terms of morals, home economics, and social science. The third group was the intermediate group. Although the Indonesian curriculum contained various health topics, “food culture” was not one of them. This might be because Indonesia has an enormous diversity of food culture. Indonesian food culture was shaped by the geographical characteristics of each region, various ethnicities, and religions, as well as the cultural assimilation that resulted from international trading and colonialism. Hence, every region has a different food culture depending on the natural, historical, and cultural uniqueness of the region [13]. The introduction of food culture in a national curriculum might be difficult due to the differences. Although other countries might have various cultures and ethnicities, only the Indonesian curriculum has lots of varieties depending on the religions to which students belonged. In addition, health-related topics were tried to educate children, associating with their culture. The match between individuals and their cultures confers benefits in many domains [14, 15]. People whose behavior aligns with their cultural norms tend to experience positive or pleasant feelings [16–18]. The decision regarding whether nutrition-oral education-related items would be taught as part of morals, home economics, social science, or health may help develop the curriculum of nutrition-oral education.

Since ESD remains a new topic in health education, a solid structure for this topic was not identified in any country. Many items were taught as part of science, while some were taught as part of social studies. Climate change was the most commonly taught item across all countries. The items related to the environment were relatively limited compared to those related to natural disasters. ESD was a new concept that was proposed at the World Summit on Sustainable Development in 2002, and it has been promoted internationally by UNESCO, as the lead agency, based on the “United Nations Decade of Education for Sustainable Development” framework [19] and the “UNESCO Global Action Program on Education

for Sustainable Development (ESD)” [20] adopted at the 37th UNESCO General Conference in 2013. Despite the efforts of UNESCO or other agencies, subjects related to ESD were not well developed in the targeted countries. This is an issue that needs to be addressed in the future. Moreover, ESD is a comprehensive topic and does not deal only with global warming. Thus, introducing ESD into the curriculum while maintaining consistency with Sustainable Development Goals-related education, which is currently being introduced in several countries, should be considered.

Although we tried to find the surveys which compared the health-related curricula of several countries, any similar survey was not identified. However, we found an article that focused only on food education and compared the curricula of 11 countries (Czech Republic, Denmark, England, Iceland, Ireland, Japan, Norway, Scotland, Slovenia, Sweden) [21]. This study revealed that only Norway had a unique food curriculum, where food is the central topic. In all other countries, food is only one part of the curriculum which has different central learning, such as general health subjects, science, and so on. This study also mentioned that food education is included within mandatory, primary academic curriculums and addresses food literacy. This differs from existing literature that examines food education as an “add-on” to the curriculum and begins to address the lack of research about food education within curriculums. The result of this study matched our study. Even in high-income countries, food education was added to existing subjects in many countries.

In Indonesia, several health-related components are included in the Indonesian language subject. In our opinion, this seems a well-elaborated strategy to overcome the differences of religions and promote children’s health. This may offer insights to policymakers who want to develop their own curriculum based on their culture.

There may be two approaches to developing health-related curricula. One is the culture-based approach, followed by Japan and Indonesia. These countries attempt to promote healthy behaviors, enhancing them as moral codes or community-friendly behaviors. The other is a science-based approach, followed by the Philippines, the Marshall Islands, and Fiji. These countries attempt to promote children’s health through scientific perspectives. Guam may belong to the intermediate state. Relatively, FSM and Palau had not developed a health-related curriculum. The culture-based approach may have a bigger impact than the science-based approach in enhancing healthy behaviors among children. Moreover, it is easy to involve the community. The disadvantage of this approach is the complexity of its development and the difficulties of adapting to not

only various ethnic/religious groups but also rapid social change. On the other hand, the advantage of the scientific approach is the ease of catching up with global trends and new academic findings and developing the curriculum. In our opinion, the culture-based approach may be attractive to policy-makers who want to retain their tradition. Thus, Japanese and Indonesian approaches should be further scrutinized in future research. As we know, there were not any similar studies that compared health-related curricula among certain countries. For this meaning, this survey might bring new insights to policy makers.

Conclusion

The topic of hygiene was mainly taught based on individual practice or by enhancing knowledge of hygiene in several countries. The environmental perspective toward hygiene was not sufficiently imparted in some countries. Regarding the mental health topic, two trends were identified: while some imparted this topic mainly in terms of morals or religion, others imparted this topic in terms of health. Regarding nutrition-oral health, three groups were identified: one group imparted education on this topic in terms of health or nutrition; another in terms of morals, home economics, or social science; and the third was the intermediate group. ESD remains a new topic in health education, with no evidence of a solid structure in any country. Related knowledge was imparted as a part of science in many cases and social studies in some cases. Overall, two different approaches were identified: the cultural-based approach, which promotes healthy behaviors as moral codes or community-friendly behaviors and the science-based approach, which promotes children's health through scientific perspectives. Policymakers should initially consider the findings of this study while making decisions on which approach should be taken.

Limitation

This survey focused only on the national curricula to identify the basic structure of health education. Even if some topics were taught in moral or religion, it is not clear that they are taught not in scientific way. In addition, this survey was not aimed to reveal how deeply and widely the health-related topics were taught in the textbook level.

Abbreviations

ESD	Education for sustainable development
FSM	Federated States of Micronesia
HPS	Health promoting schools
PE	Physical education
WHO	World Health Organization

Acknowledgements

This work was supported by the Grant from the Ministry of Education, sports and culture, Japan as Eduport Project and by the Grants-in-aid for Scientific Research Japan.

Author contributions

AN, MK, ST, and JK contributed to the design of the study. AN, FS and CR performed the analysis whole data and interpreted them. AN wrote the manuscript. Other authors (CE, EG, DS, CW, HK, MC, MU, PD, RD, HE, TN, MK, and SV) contributed to analyzing the data of each country that they belong to. All authors read and approved the final manuscript.

Funding

This survey was financed by the Eduport project "School Health Policy implementation in the Small Islands Developing States in the Western-Pacific Islands for the Post-COVID-19 Era: A Multiple Case Study" (Japan, 2021–2022) and by the Grants-in-aid for Scientific Research Japan "Research on Employment Support and Training for School Managers in Special Needs Education in ASEAN Countries" (19H01701).

Availability of data and materials

OK.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

All authors approved the final version of the manuscript and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Competing interests

The authors declare that they do not have any competing interests.

Author details

¹Health Administration Center, Gifu University, Gifu, Japan. ²Department of Global Health, Graduate School of Health Sciences, University of the Ryukyus, Semburu, Japan. ³Japanese Consortium for Global School Health Research, Semburu, Japan. ⁴Department of Behavioral Sciences, College of Arts and Sciences, University of the Philippines Manila, Manila, Philippines. ⁵Departments of Environmental and Occupational Health, College of Public Health, University of the Philippines Manila, Manila, Philippines. ⁶SEAMEO TROPED Regional Centre for Public Health, Mataram, Philippines. ⁷Department of Health, Promotion and Education, College of Public Health, University of the Philippines Manila, Manila, Philippines. ⁸Faculty of Medicine, University of Mataram, Pohnpei, Indonesia. ⁹School of Health, University of Guam, Mangilao, USA. ¹⁰College of Micronesia-FSM, Pohnpei, Federated States of Micronesia. ¹¹Ministry of Health and Human Service of the Marshall Islands, Majuro, Marshall Islands. ¹²Palau Community College, Koror, Palau. ¹³Ministry of Education, Heritage and Arts of Fiji, Suva, Fiji. ¹⁴World Health Organization Representative Office for the South Pacific, Suva, Fiji. ¹⁵Faculty of Education, Shinshu University, Nagano, Japan. ¹⁶Faculty of Health and Social Services, Kanagawa University of Human Services, Yokosuka, Japan.

Received: 15 December 2022 Accepted: 7 March 2023

Published online: 30 March 2023

References

1. World Health Organization. Global Standards for Health Promoting Schools and their implementation guidance. 2020. <https://www.who.int/publications/i/item/9789240011069>. Accessed 18 Nov 2022.
2. Xu T, Tomokawa S, Gregorio Jr ER, Mannava P, Nagai M, Sobe H. School-based interventions to promote adolescent health: a systematic review in low- and middle-income countries of WHO Western Pacific Region. *PLoS ONE*. 2020;15(3): e0230046.

3. World Health Organization. Making every school a health-promoting school—Global standards and indicators. WHO, 2021. <https://www.who.int/publications/i/item/9789240025059>. Accessed 18 Nov 2022.
4. Kobayashi J, Takeuchi R, Toyama Y, Gregorio ER Jr, Kadriyan H, Estrada CAM, et al. Urgent need to strengthen school health in Asia and the Pacific Islands. *Pediatr Int*. 2021;63:1419–23. <https://doi.org/10.1111/ped.14921>.
5. McMichael AJ, Woodruff RE, Hales S. Climate change and human health: present and future risks. *Lancet*. 2006;367(9513):859–69. [https://doi.org/10.1016/S0140-6736\(06\)68079-3](https://doi.org/10.1016/S0140-6736(06)68079-3).
6. Mental Health Innovation Network (MHIN). Guideline of African School Mental Health Curriculum. <https://www.mhinnovation.net/sites/default/files/downloads/innovation/tools/African%20School%20Mental%20Health%20Curriculum.pdf>. Accessed 18 Nov 2022.
7. Mental Health Literacy. Mental Health and High School Curriculum Guide (Version 3). <https://mentalhealthliteracy.org/product/mental-health-high-school-curriculum/>. Accessed 18 Nov 2022.
8. World Health Organization. UN food Systems Summit in 2021. <https://www.who.int/news/item/23-09-2021-new-coalitions-announced-at-the-un-food-systems-summit-to-increase-access-to-healthy-diets-from-sustainable-food-systems>. Accessed 18 Nov 2022.
9. Kwan SYL, Petersen PE, Pine CM, Borutta A. Health-promoting schools: an opportunity for oral health promotion. *Bull World Health Organ*. 2005;83(9):677–85.
10. Lee A, Lo ASC, Keung MW, Kwong CMA, Wong KK. Effective health promoting school for better health of children and adolescents: indicators for success. *BMC Public Health*. 2019;19(1):1088. <https://doi.org/10.1186/s12889-019-7425-6>.
11. Lee A, St Leger LH, Ling KWK, Keung VMW, Lo ASC, Kwong ACM, et al. The Hong Kong Healthy Schools Award Scheme, school health and student health: an exploratory study. *Health Educ J*. 2018;77:857–71. <https://doi.org/10.1177/0017896918779622>.
12. Lee A, Cheng FFK, Yuen H, Ho M, Lo A, Fung Y, et al. Achieving good standards in health promoting schools: preliminary analysis one year after the implementation of the Hong Kong Healthy Schools Award scheme. *Public Health*. 2007;121:752–60.
13. Wijaya S. Indonesian food culture mapping: a starter contribution to promote Indonesian culinary tourism. *J Ethn Foods*. 2019. <https://doi.org/10.1186/s42779-019-0009-3>.
14. O'Reilly CA, Chatman J, Caldwell DF. People and organizational culture: a profile comparison approach to assessing person-organization fit. *Acad Manag J*. 1991;34(3):487–516. <https://doi.org/10.2307/256404>.
15. Stephens NM, Markus HR, Fryberg SA. Social class disparities in health and education: reducing inequality by applying a sociocultural self model of behavior. *Psychol Rev*. 2012;119(4):723–44. <https://doi.org/10.1037/a0029028>.
16. De Leersnyder J, Mesquita B, Kim H, Eom K, Choi H. Emotional fit with culture: a predictor of individual differences in relational well-being. *Emotion*. 2014;14(2):241–5. <https://doi.org/10.1037/a0035296>.
17. Fulmer AC, Gelfand MJ, Kruglanski AW, Kim-Prieto C, Diener E, Pierro A, et al. On “feeling right” in cultural contexts: how person-culture match affects self-esteem and subjective well-being. *Psychol Sci*. 2010;21(11):1563–9. <https://doi.org/10.1177/0956797610384742>.
18. Kitayama S, Markus HR. The pursuit of happiness and the realization of sympathy: cultural patterns of self, social relations, and well-being. In: Diener E, Suh EM, editors. *Culture and subjective well-being*. Cambridge, MA: The MIT Press; 2000. p. 113–61.
19. UNESDOC Digital Library. UN decade of education for sustainable development, 2005–2014: the DESD at a glance. 2005. <https://unesdoc.unesco.org/ark:/48223/pf0000141629>. Accessed 18 Nov 2022.
20. UNESDOC Digital Library. UNESCO Global Action Programme on Education for Sustainable Development: information folder. 2016. <https://unesdoc.unesco.org/ark:/48223/pf0000246270>. Accessed 18 Nov 2022.
21. Smith K, Wells R, Hawkes C. How primary school curriculums in 11 countries around the world deliver food education and address food literacy: a policy analysis. *Int J Environ Res Public Health*. 2019. <https://doi.org/10.3390/ijerph19042019>.

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Ready to submit your research? Choose BMC and benefit from:

- fast, convenient online submission
- thorough peer review by experienced researchers in your field
- rapid publication on acceptance
- support for research data, including large and complex data types
- gold Open Access which fosters wider collaboration and increased citations
- maximum visibility for your research: over 100M website views per year

At BMC, research is always in progress.

Learn more biomedcentral.com/submissions

