ATATÜRK ÜNİVERSİTESİ YAYINLARI
ATATURK UNIVERSITY PUBLICATIONS

Research Article *Araştırma Makalesi* DOI: 10.5152/AUJKKEF.2023.23367

Integration of Occupational Health and Safety Culture into K-12 Curriculums Published by the Ministry of National Education: The Example of Türkiye

Milli Eğitim Bakanlığı Tarafından Yayınlanan K12 Müfredat Programlarına İş Sağlığı ve Güvenliği Kültürünün Entegrasyonu: Türkiye Örneği

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This article is derived from the Master's thesis titled "Examination of the Integration of Occupational Health and Safety Education into the Curriculum Published by the Ministry of National Education," conducted under the supervision of Assoc. Prof. Dr. Pınar Baykan by Ömer Karabulut at Ağrı İbrahim Çeçen University Graduate School of Education.

Bu makale Ömer Karabulut'un Ağrı İbrahim Çeçen Üniversitesi Lisansüstü Eğitim Enstitüsü'nde Doç. Dr. Pınar Baykan'ın danışmanlığında yürüttüğü "İş Sağlığı ve Güvenliği Eğitiminin Millî Eğitim Bakanlığı tarafından yayınlanan öğretim programlarına entegrasyonun incelenmesi" başlıklı Yüksek Lisans tezinden türetilmiştir.

Geliş Tarihi/Received: 10.11.2023
Kabul Tarihi/Accepted: 12.12.2023
Yayın Tarihi/Publication Date: 27.12.2023

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Cite this article as: Karabulut, Ö., & Baykan, P. (2023). Integration of occupational health and safety culture into K-12 curriculums published by the Ministry of National Education: the example of Türkiye. *Educational Academic Research*, 51, 112-127.

ABSTRACT

The primary objective of Occupational Health and Safety (OHS) is to create a healthy and safe working environment. Because of this should be provided at a young age to instill awareness of a safety culture. This study aims to examine the integration of OHS into education in the K-12 Curriculum published by the Ministry of National Education. The study employed the qualitative research method of document analysis. The data source consisted of documents from the Ministry of National Education, specifically the K-12 curriculum, content analysis was performed. OHS topics identified in the study include Health, Hazard, Risk, Safety, Precaution, Emergency, Security, Protection, OHS, Duties, Responsibilities, Equipment, Traffic Rules. The results of the study indicate that the preschool education program emphasizes objectives, are considered important in developing attitudes toward health protection and imparting safety awareness. In primary school programs, it is understood, the fundamental objectives related to OHS are aimed at creating a culture of health and safety. However, the effort to instill awareness of health and safety culture in primary schools is deemed insufficient, leading to a lack of continuity in other educational levels. In vocational education programs, objectives related to OHS were identified, but it was observed that these objectives were more of a warning nature rather than developing the ability to understand, assess sector-specific risks. Particularly in vocational education, it is recommended to add practical programs to the curriculum in collaboration with occupational safety experts and industry representatives, providing students with the opportunity to assess potential hazards in the workplace.

Keywords: Curriculum, occupational health and safety, safety culture

ÖZ

İş sağlığı ve güvenliği (İSG)'nin temel amacı sağlıklı ve güvenli bir çalışma ortamının oluşturulmasıdır. Sağlıklı ve güvenli çalışma ortamı sağlamak için küçük yaşlarda bu yönde eğitimler verilerek güvenlik kültürü bilinci kazandırılmalıdır. Bu çalışmada Millî Eğitim Bakanlığı tarafından yayımlanan K-12 Müfredatında iş sağlığı ve güvenliğinin eğitime entegrasyonunun incelenmesi amaçlanmıştır. Çalışma nitel araştırma yöntemlerinden doküman inceleme yöntemi ile yürütülmüştür. Veri kaynağı olarak Milli eğitim bakanlığı tarafından yayınlanan K-12 öğretim programı dokümanları kullanılmış ve içerik analizi yapılmıştır. İSG konu alanları; *Sağlık, Tehlike, Risk, Güvenlik, Önlem, Acil durum, Emniyet, Korunma, İş Sağlığı ve Güvenliği, Görev ve Sorumluluklar, Ekipman, Trafik* kuralları olarak belirlenmiştir. Çalışma sonucunda okul öncesi eğitim programında, sağlığı korumaya ilişkin tutum geliştirme ve güvenlik farkındalığını kazandırma yönünde önemli kazanımlara yer verilmiştir. İlkokul programlarında, İSG ile ilgili temel kazanımların, sağlık ve güvenlik kültürü oluşturmaya yönelik olduğu anlaşılmıştır. Ancak ilkokulda sağlık ve güvenlik kültürü bilinci kazandırma çabası diğer kademelerde yetersiz kaldığından devamlılığın sağlanamadığı değerlendirilmiştir. Mesleki eğitim programlarında ise İSG konu alanlarına yönelik kazanımlar tespit edilmiş ancak kazanımların, meslek alanlarına özgü riskleri anlama ve değerlendirme becerisi kazandırma yönünde değil uyarı niteliğinde olduğu görülmüştür. Çalışma sonucunda öğrencilerin, kendi güvenlikleri ve

sağlıkları için riskleri değerlendirip güvenli karar alabilme becerilerinin geliştirilmesini sağlayacak İSG kazanımlarının hazırlanması önerilmektedir. Müfredat tasarlanırken, sektörel ihtiyaçlar dikkate alınarak temel İSG konularını kapsayan ayrı bir ders içeriği oluşturulmalı ve müfredata eklenmelidir. Temel İSG derslerinin uzman kişilerce verilmesine imkân tanıyacak düzenlemeler yapılabilir. Özellikle mesleki eğitimde, iş güvenliği uzmanları ve sanayi temsilcileriyle iş birliği yapılarak öğrencilere işyerindeki potansiyel tehlikeleri değerlendirme fırsatı sunacak uygulamalı programların müfredata eklenmesi önerilmektedir.

Anahtar Kelimeler: İş sağlığı ve güvenliği, müfredat, güvenlik kültürü

Introduction

The International Labor Organization (ILO) calls on countries to create healthy and safe working environments and emphasizes the need to protect employees against work accidents and occupational diseases. The ILO, an organization that embraces this goal, has issued numerous conventions and recommendations, urging member states to implement measures to protect workers from occupational accidents and diseases. In particular, the ILO Constitution calls on countries to make improvements in poor working conditions for the sake of global peace (ILO Constitution, 2014). As a member state of the ILO, our country has ratified many conventions. The Convention No. 187, titled "Promotional Framework for Occupational Safety and Health," dated 2006, has played a significant role in accelerating the development of a culture of health and safety in our country. This convention has led to the adoption of an OHS policy aimed at establishing a preventive safety culture. In today's world, the importance of safety culture is paramount in reducing the increasing number of occupational accidents and diseases. To develop a safety culture, individuals need to gain awareness and understanding of occupational health and safety. In fact, according to the 2021 Social Security Institution (SGK) labor force statistics in our country, a total of 511,084 occupational accidents occurred under the 4-1/a and 4-1/b categories, resulting in 1429 fatalities and 1207 cases of diagnosed occupational diseases. These statistics highlight the necessity of increasing efforts toward the development of a safety culture. Safety culture is defined as the behaviors exhibited in a workplace that determine the level of health and safety, shaped by the values, attitudes, perceptions, and skills of employees (Health and Safety Commission [HSC], 1995). Therefore, societies with established safety cultures are a crucial component for creating a healthy and safe working environment. The 2003 report from the European Agency for Safety and Health at Work aimed to integrate OHS topics into education in Europe. The report covers all levels of education, including preschool, primary and secondary schools, as well as vocational education. The integration of health and safety into education will contribute to the formation of positive behavioral changes regarding safety and health in children. The "Rome Declaration on Occupational Safety and Health in Schools" was announced by the Italian EU Presidency on October 3, 2003, with the goal of promoting occupational health and safety in education. The Rome Declaration on the dissemination of occupational health and safety in education has been a significant step toward enhancing safety and health awareness throughout Europe.

Preparing the future actors of the workforce in line with the requirements of the era with a culture of occupational health and safety is an important step in facilitating the transformation of perceptions and attitudes toward safety and health into behavior. Therefore, general occupational health and safety topics should be integrated into the curriculum of preschools, primary schools, secondary schools, high schools, and vocational education institutions. In this context, necessary steps have been taken by ministries in our country, and cooperation has been established for the integration of OHS education. In 2019, the Ministry of National Education and the Ministry of Family, Labour and Social Services signed the "Protocol on the Integration of Occupational Health and Safety into Education." This protocol is a significant development in terms of incorporating occupational health and safety into all educational activities. As in the rest of the world, it is known that the culture of safety is a crucial component in preventing occupational accidents in our country. However, the formation of this culture will only be possible through individuals receiving education with a focus on health and safety concepts. Indeed, individuals apply the knowledge they have acquired through education and exhibit correct behavioral models regarding occupational health and safety (Kılkış and Demir, 2012).

According to the International Labor Organization, accidents and occupational diseases cause a loss of approximately 4% of the world's gross domestic product (GDP) every year due to healthcare expenses and the necessity of practices such as rehabilitation (Reynaud, 2017). In this context, the field of occupational health and safety, where it is aimed to minimize work accidents and occupational diseases by applying measures against possible events that may occur in the working environment, is considered an important area in terms of protecting human life and preventing material and moral losses related to this (Melchior and Zanini, 2019). According to studies conducted in the field of occupational health and safety, fundamentally reducing occupational accidents and occupational diseases is closely related to the creation of a safety culture in the organizational context.

A strong safety culture reduces accidents, near misses and other safety problems. The fact that safety culture has a protective effect before occupational accidents occur causes especially large-scale industries to pay more attention to safety culture to reduce the accident potential (Tetzlaff et al., 2021). Providing OHS training not only during the on-the-job process but also starting from the lowest level of education and training is considered very important for creating a safety culture in individuals. In this regard, various studies have been carried out in the literature on OHS training. For example, in a study conducted with 281 university students, OHS training was provided via distance education, and it was determined that the training provided contributed to the cultural accumulation of occupational health and safety (Olcay, Temur, & Sakalli, 2021).

In another study, the curriculum for OSH training at the Canadian high school level was examined and it was recommended that the curriculum be updated to create a safety culture by focusing on the transfer of expert occupational safety and health information

to individual employees (Gerarda Power, & Baqee, 2010). In another study conducted with 123 university students, it was determined that construction department students were only aware of the use of protective equipment and lacked general Occupational Health and Safety knowledge (Afolabi et al., 2016). Another study in the literature touched upon the need to provide a motivating learning environment and provide holistic professional information through experts to develop a safety culture (Mykhnyuk, & Abiltarova, 2020). In another study conducted with 362 Chinese undergraduate students, it was recommended that new educational strategies be developed to improve safety culture and that OHS courses be offered compulsory in all departments (Gong, 2019).

When the studies are examined, it is understood that both employers and employees have a lack of training on OHS (Nuvit, 2012; Yılmaz, 2009), and that OHS training is necessary to create a safety culture, but the curricula determined to carry out OHS training should be reviewed. Therefore, the attitudes, beliefs, and values of employees toward demonstrating safe behavior should be positively developed. Since building awareness is a long process, integrating OHS training into formal education is seen as crucial in ensuring the development of a safety culture. Including occupational health and safety in all levels of education from preschool onward will contribute to the upbringing of individuals who prioritize their own health and safety from a young age. Revealing the current status of the integration of OHS into the education process is crucial in guiding future efforts to prepare educational programs and addressing any shortcomings.

In this study, conducted with the aim of examining the integration of occupational health and safety culture into the curriculum published by the Ministry of National Education, the following research problem was addressed.

- What is the reflection status of occupational health and safety topics in the curriculum published by the Ministry of National Education (MEB) in our country, in terms of school and classroom levels, specific subjects, and unit-based gains?"

Methods

The Research Method

This study was conducted using the document analysis method, which is one of the qualitative research methods. Document analysis is a technique used to examine or evaluate both electronic and printed materials. It involves reviewing, reading, and interpreting (Bowen, 2009). In other words, data are collected from primary sources, examined, scrutinized, and analyzed (O'Leary, 2017). The document analysis method consists of stages such as accessing documents, verifying their authenticity, understanding the documents, analyzing the data, and utilizing the data (Yıldırım and Şimşek, 2016). The research process is presented in Table 1.

According to the research question, the latest curriculum programs published by the Ministry of National Education (MEB) for all school levels, as well as the preschool education program, were determined as the documents. Additionally, the curriculum programs published under the title "Critical Topics and Gains for the Second Semester of the 2019–2020 Academic Year" by the Ministry of National Education were also included. The official website of the Ministry of National Education was used to access the documents. The examined curriculum programs were coded as CP1: Preschool Education Program, CP2: Primary Education Program, CP3: Secondary Education Program, and CP4: Vocational High Schools Education Program. The process of the research is presented in Figure 1.

Data Analysis

In this research, the content analysis method was utilized as a reference for analyzing the data. Content analysis involves classifying the content of a text based on predefined analysis units (Duvarger, 1989). In other words, it is the process of organizing information into categories relevant to the research questions (Bowen, 2009). In this study, the curriculum programs were subjected to content analysis based on levels, subjects, units, content, and gains. To determine the reflection of occupational health and safety topics in the curriculum of all subjects, analysis units were identified. These analysis units can be words, themes, characters or individuals, sentences/paragraphs, or content. In this context, analysis units were determined to identify the reflection of occupational health and safety topics in the curriculum. All curriculum programs were analyzed within the framework of these analysis units.

The analysis units were determined as Health, Risk, Safety, Precaution, Emergency, Security, Protection, Occupational Health and Safety, Danger, Duties and Responsibilities, Equipment, and Traffic Rules.

Reliability and Validity Measures

In this study, the data obtained through document analysis were analyzed and reported using the content analysis method. In order to ensure the transferability of the research in the validity practices of the research, the method, data collection process and data analysis process were explained in detail. In terms of reliability measures in the study, support was obtained from an expert in the field of occupational health and safety to ensure data consistency by having the data checked and analyzed by the expert.

Table 1.
The Research Process

Stage	Process
Selection of documents according to the research topic	The latest curriculum programs published by the Ministry of National Education (MEB) for all school levels, as well as the preschool education program, were identified as the documents for this study.
Accessing documents and checking their originality	The official website of the Ministry of National Education was used to access the documents (http://mufredat.meb.gov.tr/Default.aspx).
Reading and understanding documents	The curriculum programs for all levels were accessed, and the researcher thoroughly read the courses at each level, identifying the gains.
Analyzing data	In the research, the content analysis method, which is one of the qualitative research analysis methods, was used as a reference for analyzing the data.
Comments	The data obtained from content analysis were interpreted to answer the research questions.

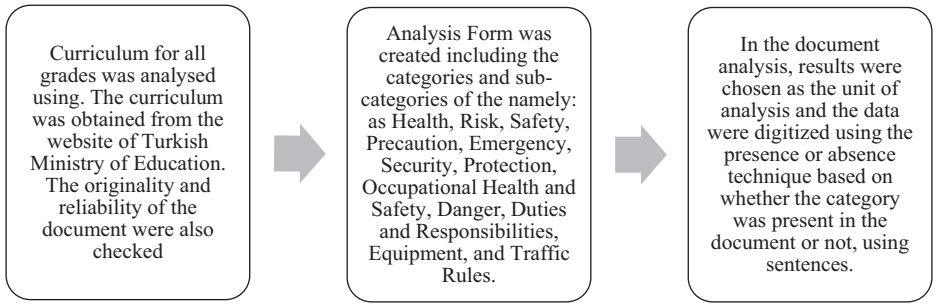

Figure 1.
The Process of the Research.

Findings

The curriculum programs published by the Ministry of National Education (MEB) in our country were examined to address the question of how the reflection status of occupational health and safety topics varies across school and classroom levels, specific subjects, and units. This examination covered all school levels, including Preschool, Primary Education, Secondary Education, and Vocational and Technical Education.

As a result of the analysis, it was observed that there are some gains related to occupational health and safety analysis units in all school levels. In almost all of these gains, health and safety units stand out, while protection and security are sparsely distributed in some levels.

The distribution of gains related to occupational health and safety analysis units in all school levels was examined based on educational levels (Figure 2). When the distribution of gains by educational levels is examined, it was determined that there are a total of 89 gains, with 6 gains in Preschool Education Program, 53 gains in Primary Education Program, 11 gains in Secondary Education Program, and 19 gains in High School Education Program. Proportionally, the highest number of gains, 60%, is observed in the primary education level, while the lowest, 7%, is observed in the preschool education level.

When we look at the distribution of objectives reflecting OHS analysis units according to class levels (Figure 3), it is observed that the highest number of objectives related to OHS analysis units are included in first-grade objectives, while the lowest are in 11th-grade objectives. The distribution indicates that there is a higher emphasis on OHS analysis unit-related objectives in primary education, but the number of these objectives is lower in secondary education. Additionally, at the high school level, it is observed that a significant portion of the objectives are concentrated at the ninth-grade level, and the reflection of OHS analysis unit-related objectives is lower at the 10th, 11th, and 12th-grade levels.

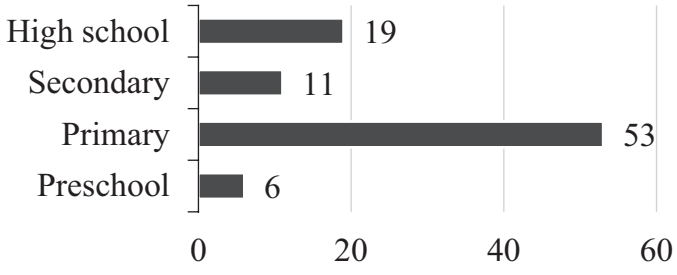

Figure 2.
Distribution of Gains Reflecting OHS Subject Analysis Units According to Education Levels.

Table 2 provides an overview of the subjects and school levels where the reflection of objectives related to OHS analysis units was examined.

When Table 2 is examined, it is observed that in the ninth-grade program, which has the highest number of objectives in the high school curriculum, 6 objectives are found in the “Health Education and Traffic Culture” course, while the remaining 13 objectives are found in the “Physical Education, Chemistry, Guidance, Geography, and Physics” courses. In the middle school curriculum, the objectives related to OHS analysis units are encountered in the “Social Studies, Science, Physical Education, and Guidance” courses. In the primary education program, which has a large share of the total objectives, such as 60%, out of the total 53 objectives, 27 of them are found in the "Life Skills" course, while the remaining objectives are identified in the “Social Studies, Physical Education and Play, Science, Physical Education and Sports, Traffic Safety, and Guidance” courses. According to the data, it is concluded that in the primary education program, the analysis unit that is most reflected in the objectives is “safety.” When looking at the presence of OHS analysis units in all educational levels, it is generally observed that these analysis units are included in all curriculum programs.

When the curriculum programs of vocational high schools are examined (Table 3), it is observed that the occupational health and safety analysis units, which include the words “Health, Safety, Risk, Hazard, Precaution, Emergency, Traffic Rules, Safety, Occupational Health and Safety, Protection, Duties and Responsibilities, and Equipment,” are included. These units are most frequently reflected in objectives in the fields of “Maritime, Electrical-Electronic Technology, Construction Technology, Firefighting and Fire Safety, Mining Technology, Rail Systems Technology, and Health Services.” In the field of Construction Technology, the course on Construction Occupational Health and Safety stands out. Additionally, when the courses of some fields are examined, it is observed that there is a significant emphasis on objectives starting with the phrase “complying with occupational health and safety measures.” However, it is thought-provoking how much contribution these objectives will make to the development of the desired safety culture.

Sample objective statements:

ECP1 (Preschool): "Protects oneself from dangers and accidents."
ECP2 (Life Skills): "Recognizes the precautions to take to protect one's health."
ECP2 (Physical Education and Games): "Mentions the elements to pay attention to for protecting one's health and safety while participating in games and physical activities."
ECP2 (Guidance): "Provides examples of roles and responsibilities in one's life."

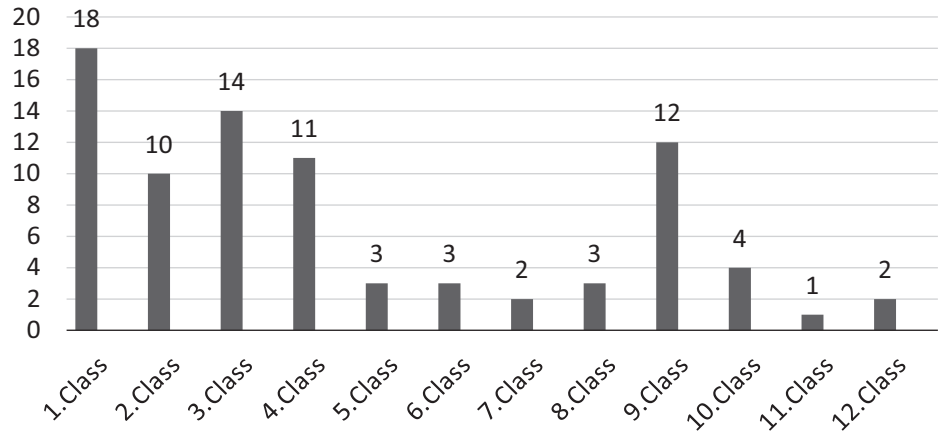

Figure 3.
Distribution of Objectives Reflecting Occupational Health and Safety Topic Analysis Units According to Class Levels.

ECP3 (Health Knowledge and Traffic Culture Course): "Explains the concept of health and analyzes the effects of environmental factors on personal and public health."
ECP3 (Health Knowledge and Traffic Culture Course): "Explains the precautions to be taken for safe first aid."
ECP3 (Chemistry Course): "Explains the occupational health and safety rules to be followed in chemistry laboratories."
ECP3 (Physical Education): "Explains basic first aid practices."
ECP3 (Geography): "Explains methods of protection from disasters."
ECP4 (Maritime Field): "Assesses accidents and threats related to one's own occupational health and safety on board in compliance with international maritime standards."
ECP4 (Electrical-Electronic Technology Field): "Applies occupational health and safety rules in the workshop."
ECP4 (Construction Technology Field): "Contributes to the implementation of occupational health and safety measures."
ECP4 (Firefighting and Fire Safety Field): "Applies the effective intervention method according to fire classes by taking occupational health and safety measures."
ECP4 (Mining Technology Field): "Explains the protection measures against radioactive raw material sources and radioactive effects."
ECP4 (Rail Systems Technology Field): "Implements the emergency action plan and occupational safety measures."

In the preschool education program, it is observed that some objectives related to OHS are included. The preschool education program is prepared considering the developmental characteristics of children according to age groups. Unlike other programs, objectives and indicators are determined in this program. It is concluded that the areas of "health, danger, and safety" are included in this program. Developmental characteristics according to age groups have been taken into consideration, and a general objective related to self-protection from dangers and accidents has been provided in terms of personal care skills. In addition to objectives, indicators are provided in the preschool program. The indicators for this objective are as follows:

- "Identifies dangerous situations."
- "State what needs to be done to protect oneself from dangers and accidents."

Table 2.
School Levels and Subjects Including Occupational Health and Safety Analysis Units

OSH Subject Areas	School Level	Class	Lesson
Health Precaution Hazard Protection Duty and responsibility Traffic Rules	Preschool	2–6 years old	General (attainment and indicator)
Health Security Risk Precaution Occupational health and safety Duty and responsibility Equipment	Primary education	1, 2, 3, 4	Physical education and play
Health Security Risk Precaution Occupational health and safety Protection Duty and responsibility Equipment	Primary education	5, 6, 7, 8	Physical education and sports
Health Security Risk Precaution Protection Duty and responsibility	Primary education	5, 6	Information technologies and software
Security Precaution	Primary education	1, 2, 3, 4	Information technologies and software
Health Risk Hazard Precaution Protection Duty and responsibility	Primary education	6, 7, 8	Environmental education and climate change
Health Security Risk Precaution Safety Occupational health and safety Protection Duty and responsibility	Primary education	4, 5, 6, 7, 8	Religious culture and moral knowledge

(*Continued*)

Table 2.
School Levels and Subjects Including Occupational Health and Safety Analysis Units (Continued)

OSH Subject Areas	School Level	Class	Lesson
Health Security Risk Precaution Hazard Protection Duty and responsibility	Primary education	3, 4, 5, 6, 7, 8	Science
Health Risk Precaution Occupational health and safety Protection Duty and responsibility	Primary education	1, 2, 3, 4, 5, 6, 7, 8	Visual arts
Health Security Risk Precaution Emergency Traffic rules Safety Protection Duty and responsibility	Primary education	1, 2, 3	Life skills
Health Risk Precaution Duty and responsibility	Primary education	4	Human rights, citizenship and democracy
Health Risk Precaution Duty and responsibility	Primary education	1, 2, 3, 4, 5, 6, 7, 8	Math
Health Risk Precaution Duty and responsibility	Primary education	1, 2, 3, 4, 5, 6, 7, 8	Music
Health Safety Risk Precaution Emergency Protection Duty and responsibility	Primary education	4, 5, 6, 7	Social studies
Health Safety Risk Precaution Occupational health and Safety Duty and responsibility	Primary education	7, 8	Technology and design
Health Security Risk Hazard Precaution Traffic Rules Safety Duty and responsibility Equipment	Primary education	4	Traffic safety
Health Risk Precaution Protection Duty and responsibility	Primary education	1, 2, 3, 4, 5, 6, 7, 8	Turkish
Health Safety Risk Precaution Occupational health and safety Duty and responsibility	Secondary Education	9, 10, 11, 12	Physical education and sports
Hazard Duty and responsibility	Secondary Education	9, 10, 11, 12	Theory of information
Precaution Safety Duty and responsibility	Secondary Education	9, 10, 11, 12	Computer science
Health Safety Hazard Precaution Occupational health and safety Protection	Secondary Education	9, 10, 11, 12	Biology
Health Safety	Secondary Education	9, 10, 11, 12	Contemporary Turkish and world history
Precaution Occupational health and safety Protection Duty and responsibility	Secondary Education	9, 10, 11, 12	Geography
Health Safety Occupational health and safety	Secondary Education	9, 10, 11, 12	Religious culture and moral knowledge
Duty and responsibility	Secondary Education	10, 11	Philosophy
Health Safety Hazard Precaution Occupational health and safety Protection	Secondary Education	9, 10, 11, 12	Physical
Precaution Occupational health and Safety Duty and responsibility	Secondary Education	9, 10, 11, 12	Visual Arts
Health	Secondary Education	9, 10, 11, 12	History of Islamic science
Health Safety Hazard Precaution Occupational health and safety	Secondary Education	9, 10, 11, 12	Chemical
Hazard Precaution	Secondary Education	9, 10, 11, 12	Logic
Duty and responsibility	Secondary Education	9, 10, 11, 12	Life of our Prophet
Risk Precaution Duty and responsibility	Secondary Education	9, 10, 11, 12	Preparing project
Health Precaution Traffic rules Duty and responsibility	Secondary Education	9, 10, 11, 12	Psychology
Health Safety Risk Hazard Precaution Emergency Traffic rules Protection Duty and responsibility	Secondary Education	9, 10, 11, 12	Health information and traffic culture
Health Safety Hazard Precaution Duty and responsibility	Secondary Education	9, 10, 11, 12	International relations

- "Knows the basic safety rules."
- "Keeps away from dangerous situations, individuals, and habits."
- "Seeks help in case of any danger or accident."

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Table 1.
Vocational High School Fields and Courses that Include OHS Subject Area Analysis Units

OHS subject analysis units	Lesson	Class	Field	Objectives
Safety	Intervention Methods in Penal Institutions	11,12	Justice	It carries out the transportation of detainees and convicts by taking the necessary security measures.
Occupational health and Safety (Ergonomics)	Keyboard Techniques	9		Sits ergonomically at the computer while preparing documents.
Health	Nutrition	10	Family and Consumer ervices	Explains the effects of eating habits on disease development.
Occupational health and Safety Safety	Children Activities	11,12		Performs activities such as body painting, painting and handicrafts in accordance with occupational health and safety rules.
Occupational health and Safety (Safety)	Home Services	11,12		Uses cleaning tools and equipment by taking occupational health and safety measures.
Occupational health and safety (Safety)	Recycled Packaging	11,12		It ensures the recycling of glass, metal, paper and plastic packaging in accordance with occupational health and safety measures, legislation and techniques.
Occupational health and Safety (Safety)	Table Arrangement	11,12		Takes occupational health and safety measures and carries the plates in accordance with the service rules.
Occupational health and Safety (Ergonomi) Risk Safety	Housing Acquisition and Arrangement	11,12		Takes occupational health and safety measures and places the items in accordance with their characteristics and location. Explains security measures against risks.
Health	The Environment We Live in	11,12		Explain the effects of environmental pollutants on health.
Health Equipment	Meal Prepration	11,12		It creates measures to ensure food, equipment and working environment hygiene in places where mass food production is carried out in accordance with national and international legislation.
Health Safety	Professional development	9	Shoe and Saddlery Technology	Takes the necessary safety precautions against accidents, injuries and fire that may occur in the work environment. Determines the elements that threaten health and safety in the workplace and takes the necessary health and safety measures.
Health Safety	Radiology Devices Workshop	11	Biomedical Device Technologies	Explains radioactive health and safety precautions.
Hazard Precaution Health Risk	Occupational Physiology and Terminology	10		Takes precautions against dangers arising from the environment or device. Takes precautions to protect the body against disease risks. Takes necessary precautions against possible risks to the environment
Protection	Operating Room and Intensive Care Devices	11		Explains the methods of protection from medical gases.
Occupational health and Safety (General)	Human Resources Management	11,12	Office Management and Executive Assistance	Defines the concepts of occupational health and safety, explains the purpose and importance of occupational health and safety, lists the causes and precautions of work accidents and occupational diseases, explains the legislation and obligations related to occupational health and safety, lists and explains the institutions and organizations responsible for occupational health and safety, and plans and implements occupational health and safety training..
Health	Self-Care in Early Childhood and Special Education	10	Child Development and Education	It helps children aged 0-6 gain skills related to personal cleaning, care and toilet needs in accordance with hygiene rules.
Health	First Aid for Children	11,12		Explains the basic concepts and basic applications of first aid.

Occupational health and Safety Health Emergency Precaution	Safety at Sea	10	Marine	Evaluates accidents and threats to its own occupational health and safety on the ship in accordance with international maritime standards. Provides first aid by taking the necessary precautions in emergency situations in accordance with international maritime standards.
Health Safety Occupational health and Safety Precaution Security	Advanced Maritime Training	11,12		Lists occupational health and safety measures against fire hazard related to cargo handling and transportation of liquefied gases in bulk. Takes occupational health and safety measures to prevent environmental pollution. Applies healthy and safe management rules on tankers. Takes fire prevention measures on the ship. Takes precautions regarding passenger safety, load safety and boat integrity.
Occupational health and Safety Equipment	Basic Electrical-Electronics Workshop	9	Electrical-Electronic Technology	Applies OHS rules in the workshop. Explains the protective equipment used in the mechanical workshop.
Equipment Security Safety	Elevator Assembly Workshop	11		Explains personal protective equipment. Explains the safety materials used in the workshop. Explains the safety and rules of working in the assembly workshop. Controls the security systems for elevator operation.
Security Safety	Elevator Maintenance and Repair	11		Hangs appropriate warning signs to inform the building during maintenance and installs safety strips. Performs cabin top maintenance by taking safety precautions.
Safety	Elevator Final Inspections and Tests	11,12		Explains the safety precautions before the examination.
Occupational health and Safety Equipment Safety Risk	Yg Systems	11,12		Takes necessary occupational safety measures in HV facilities. Uses occupational safety equipment in HV facilities in accordance with the technique. Takes safety precautions when working at heights above the conductor. -Explains the purpose and importance of grounding in HV facilities.
Occupational health and Safety	Basic Photography	9	Journalism	Prepares the shooting environment in line with occupational health and safety measures and takes appropriate test shots.
Occupational health and Safety Equipment Protection	Ship Basic Operations	9	Ship Construction	Implements occupational health and safety measures and uses personal protective equipment.
Occupational health and Safety Equipment	Gemi Kaynak Uygulamaları	11		Prepares welding equipment by taking occupational health and safety measures.
Occupational health and Safety Equipment	Wooden Yacht Manufacturing	10		Performs the spine and its assembly by taking occupational health and safety measures and using personal protective equipment.
Security	Ship Equipment Maintenance and Repair	11,12		Adjusts the pressure of safety and quick closing valves in accordance with TSE Standards.
Sağlık Önlem	Food Microbiology	9	Food Technology	Explains ways to prevent microbial contamination in foods.
Occupational health and Safety Equipment	Laboratory Technique	9		Implements occupational health and safety measures and uses personal protective equipment. Applies safety measures when using chemical substances. Takes preventive measures against accidents that may occur in the laboratory.

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Table 1.
Vocational High School Fields and Courses that Include OHS Subject Area Analysis Units (Continued)

OHS subject analysis units	Lesson	Class	Field	Objectives
Occupational health and Safety Health Precaution	Food Hygiene and Sanitation	9		Ensures workplace hygiene in compliance with occupational health and safety rules, environmental protection measures, and regulations.
Health Safety	Microbiological Analysis in Foods	10		Organizes the laboratory environment in accordance with health and safety rules, ergonomic principles, and aseptic rules.
Duty and Responsibilit	Professional Law	10	Public Relations	Fulfills professional responsibilities as a public relations student or employee.
Duty and Responsibilit	Call Center Operations	11		Explains responsibilities of professionals in the sector in terms of competencies and ethical principles.
Occupational health and Safety	Topography	11,12	Mapping-Real Estate-Cadastre	Applies occupational health and safety measures in compliance with Occupational Health and Safety Law.
Duty and Responsibility	Health Communication and Ethics	10	Patient and Elderly Services	Distinguishes the duties, authorities, and responsibilities of elderly/patient care personnel.
Health	Workshop	9		Ensures individual occupational health and safety in the workplace. Performs basic applications of first aid in accordance with the Ministry of Health First Aid Guide.
Occupational health and Safety Protection	Prevention of Infectious Diseases	10		Explains ways to prevent infectious diseases based on the transmission route.
Emergency	Disaster Management	11,12		Explains the importance of preparing a disaster and emergency kit.
Occupational health and Safety Precaution	Microbiology and Hygiene	10	Animal Husbandry and Health	Takes occupational health and safety measures in compliance with regulations. Takes specific precautions against infectious and zoonotic diseases.
Occupational health and Safety	Construction Technology	10	Construction Technology	Takes occupational health and safety measures in the workshop Cleans and maintains test equipment by taking occupational health and safety measures.
Occupational health and Safety	Construction Superstructure Workshop	10		Makes preparations before the wooden formwork in the superstructure wood workshop in line with the occupational health and safety directives.
Occupational health and Safety Safety	Paving Stone and Curb Coverings	11,12		Prepares safety signboards by taking occupational health and safety measures.
Occupational health and Safety Hazard Risk Precaution Equipment Security Emergency Health Safety Protection	Construction Occupational Health and Safety	11,12		Identifies hazards in the work area. Contributes to the formation and work of the risk assessment team. Contributes to the implementation of OHS measures. Checks personal protective equipment. Controls the pressure equipment. Controls the equipment used in flammable and explosive environments. Checks whether emergency instructions are implemented. Provides or helps provide first aid. Makes measurements regarding occupational safety. Supports fire response efforts.

Occupational health and Safety Precaution Protection	Basic Firefighting	9	Firefighting and Fire Safety	Takes occupational health and safety measures and applies effective intervention methods in accordance with its technique according to fire classes. Takes occupational health and safety measures and determines protection methods according to the way they are affected by hazardous chemicals.
Occupational health and Safety Hazard Precaution Security Equipment	Workshop	9		Wears work-specific protective equipment to ensure occupational health and safety. Protects against accidents by using protective equipment against job-specific hazards. Limits the dangerous area to ensure crime scene safety. Controls and maintains high security rope and other auxiliary materials used in search and rescue operations. Controls and maintains the equipment used in rescue operations. Ensures the safety of personnel and victims at the scene by pulling a safety line.
Risk Occupational health and Safety Precaution	Fire Prevention Measures	11		Accompanies fire-risk works for occupational health and safety purposes. Provides awareness training on preventive measures in businesses at risk of fire. Detects fire risk elements in buildings.
Emergency Hazard Precaution Risk	Aircraft Accident, Crimea and Fire	11		Provides communication between units in emergency situations at the airport. Evaluates the hazardous materials in a plane crash according to weather and terrain conditions. Appropriately positions rescue and extinguishing vehicles to respond to a plane crash at the airport. Intervenes in helicopter and aircraft fires with appropriate methods according to the risk situation.
Risk	Preparedness for Natural Disasters	11,12		Identifies risk areas and gathering places in the natural disaster action plan.
Protection Precaution Duty and Responsibility	Fire Crime Scene Investigation	11,12		Explains the necessary security measures. Explains the duties and responsibilities of other personnel at the scene.
Security Equipment	Basic Chemistry	9	Chemistry Technology	Explains and implements the steps of Material Safety Data Sheet. Cleans laboratory equipment.
Precaution	Introduction to Petroleum Technology	10		Takes precautions against potential damages caused by sudden pressure changes.
Protection	Control in Petroleum Technology	10		Applies protection methods in the petroleum process.
Occupational health and Safety Security Precaution	Animation Services	10	Accommodation and Travel Services	Determines activity safety measures in compliance with occupational health and safety rules.
Occupational health and Safety Equipment	Floor Services Workshop	10		Ventilates the room in compliance with occupational health and safety measures and national standards, taking necessary precautions. Performs equipment maintenance in compliance with occupational health and safety standards and operating procedures.
Occupational health and Safety	Animation Activities Workshop	10		Implements children's play activity in accordance with standards and occupational health and safety rules.
Occupational health and Safety Equipment	Floor Services Workshop	10		Performs equipment maintenance in compliance with occupational health and safety standards.
Occupational health and Safety Secuirty Precaution Health	Laboratory Safety and Preparation for Analysis	9	Laboratory Services	Takes safety measures in the laboratory in accordance with occupational health and safety rules. Provides first aid in the event of accidents in the laboratory, in compliance with regulations.

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Table 1.
Vocational High School Fields and Courses that Include OHS Subject Area Analysis Units (Continued)

OHS subject analysis units	Lesson	Class	Field	Objectives
Risk	Laboratory Quality Management System	11,12		Understands laboratory design and explains risks.
Occupational health and Safety Safety	Machine Elements and Mining Machinery	9	Mining Technology	Assembles machine parts using safe connection elements such as pins, bolts, wedges, and segments, taking occupational health and safety measures.
Precaution Protection	General Geology	9		Explains radioactive raw material sources and protection measures against radioactive effects.
Occupational health and Safety (General)	Underground Mining Operations	10		Explains drilling and blasting, ground support, and vein preparations in underground mining using appropriate methods, tools, and equipment, taking occupational health and safety measures. Explains control operations in the underground working area using appropriate methods and equipment, taking occupational health and safety measures. Explains control operations of the ventilation system in underground mining and measurements of gas and dust in the working environment, taking occupational health and safety measures. Explains production methods used in underground mining using appropriate methods and equipment, taking occupational health and safety measures. Explains the transportation process in underground mining using appropriate methods and equipment, taking occupational health and safety measures. Explains the transportation process from vertical shafts in underground mining using appropriate methods and equipment, taking occupational health and safety measures. Explains the selection of ground support according to the production method in underground mining using appropriate methods and equipment, taking occupational health and safety measures. Explains screening operations in underground mining using appropriate methods and equipment, taking occupational health and safety measures. Explains maintenance and repair operations in underground mining using appropriate methods, tools, and equipment, taking occupational health and safety measures.
Occupational health and Safety	Marble Manufacturing Techniques	12		Performs measurement, polishing, cutting, profiling, CNC marble turning, carving, coating, and bonding operations, taking occupational health and safety measures.
Occupational health and Safety	Basic Manufacturing Processes	9	Machine and Design Technology	Takes occupational safety measures in the workshop.
Security	R&D and Quality Control	11		Explains workplace safety measures.
Occupational health and Safety (Ergonomics)	Design History and Ergonomics	10		Examines basic ergonomic concepts, distinguishes ergonomic applications in work and living environments.
Occupational health and Safety	Marble Manufacturing Techniques	11,12		Performs measurements, polishing, cutting, profile turning, CNC marble turning, carving, coating, and bonding operations, taking occupational health and safety measures.
Occupational health and Safety Equipment Health	Occupational Technology	9	Metal Technology	Explains the importance of using occupational health and safety rules and personal protective equipment for the health of employees.
Occupational health and Safety Equipment	Workshop	9		Uses occupational health and safety rules and personal protective equipment.
Occupational health and Safety Equipment Health	Advanced Welding Methods	11,12		Explains the importance of using occupational health and safety rules and personal protective equipment for the health of employees.

Occupational health and Safety Precaution Protection Emergency Equipment	Vehicle Technology Workshop	9	Automotive Technology	Organizes the workspace in compliance with occupational safety rules. Takes fire prevention measures. Identifies emergency situations. Uses personal protective equipment appropriately.
Occupational health and Safety Equipment	Automotive Basic Painting Workshop	10		Prepares occupational health and safety equipment.
Occupational health and Safety Equipment	Automotive Body Welding Workshop	10		Prepares occupational health and safety equipment.
Occupational health and Safety Security	Basic Rail Systems Workshop	9	Rail Systems Technology	Takes workshop rules and work safety measures. Takes occupational health and safety measures in mechanics and electricity.
Occupational health and Safety Precaution	Rail Superstructure Workshop	11		Creates the necessary occupational safety signs in the workshop. Takes precautions on faulty rails.
Safety Occupational health and Safety Risk Emergency	Rail Safety Management System	11,12		Acts in accordance with the principles of the Rail Safety Management System related to the profession. Analyzes hazards and performs risk assessment in accordance with the operating instructions and regulations of the Rail Safety Management System. Implements the emergency action plan, taking occupational safety and security measures.
Safety Equipment	Rail System Transportation	11,12		Determines the safety elements and equipment to be used in transportation according to international and domestic instructions and regulations.
Traffic Rules	Traffic Management Systems	11		Manages train traffic from the center.
Traffic Rules	Urban Rail Systems	11		Explains the basic training provided in urban rail system traffic operations. Explains the training for train drivers provided in urban rail systems.
Traffic Rules Security	Communication in Rail Systems	11,12		Uses train traffic signals in place and on time. Uses mechanical safety equipment in place and on time.
Precaution Duty and Responsibility Risk Health Emergency Hazard	Disaster Management	11,12	Health Services	Explains general hazards and risks in our surroundings. Explains structural and non-structural hazards and risks that can lead to disasters in buildings, hazards and risks that can lead to disasters in different regions of our country, and hazards and risks that can lead to disasters worldwide. Explains the culture of disaster awareness. Explains the precautions to be taken before disasters. Explains the importance of preparing a disaster and emergency kit. Lists the measures to be taken to reduce the risk of disasters at the national level. Explains the importance, basic principles, and basic rules of first aid in disasters.
Occupational health and Safety Protection Precaution	Midwife Assistant Professional Practices	11		Takes measures to protect children from accidents, neglect, and abuse in accordance with UNICEF's baby and child monitoring protocols, considering occupational health and safety measures.
Occupational health and Safety Health Equipment	Basic Professional Practices	9		Ensures the collection of medical waste in compliance with the Medical and Hazardous Waste Control Regulation, taking occupational health and safety measures. Keeps equipment ready for use according to the Ministry of Health Service Quality Standards Guide and the operating instructions of the devices.

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Table 1.
Vocational High School Fields and Courses that Include OHS Subject Area Analysis Units (Continued)

OHS subject analysis units	Lesson	Class	Field	Objectives
Protection Health	Infectious Diseases	10		Distinguishes common viral and bacterial diseases and their prevention methods.
Security Health Precaution Protection	Professional Developmen		Civil Aviation	Takes necessary safety measures against accidents, injuries, and fires that may occur in the workplace. Identifies factors that threaten health and safety in the workplace and takes necessary measures. Learns the causes of occupational diseases and takes necessary precautions. Takes necessary measures against accidents, injuries, and fires that may occur in the workplace.
Hazard	Basic Ground Services	9		Explains dangerous goods in flight.
Equipment	Operations Services	11,12		Coordinates the availability of necessary equipment in accordance with national and international regulations.
Occupational health and Safety	Application	10	Agriculture	Implements disease and pest control methods in compliance with occupational health and safety rules.
Occupational health and Safety	Self-Propelled Agricultural Machinery	11,12		Adjusts and maintains the combine harvester according to the user manual, taking occupational health and safety measures.
Security Health	Printing Chemistry	11	Textile Technology	Takes safety measures in the laboratory in compliance with regulations and legislation. Provides first aid in laboratory accidents.
Occupational health and Safety Equipment	Basic Operations and Welding Workshop	9	Installation Technology and Air Conditioning	Takes occupational health and safety measures and uses personal protective equipment. Performs steel pipe welding with a TIG welding machine, taking occupational health and safety measures. Ignites the electrode with necessary precautions.
Hazard Emergency	Heating and Natural Gas Installation Workshop	10		Explains emergency procedures in hazardous situations.
Security	Plumbing and Solar Energy Workshop	11		Takes environmental safety measures.
Occupational health and Safety	Electric Circuit Analysis Workshop	9	Aircraft Maintenance	Takes occupational health and safety measures.
Safety Security Risk Precaution	Aviation Safety and Security	10	Transportation Services	Explains safety and security concepts. Explains aviation risks and measures that can be taken for aviation safety.
Occupational health and Safety Hazard	Transportation Models	10		Performs road transportation of hazardous materials in compliance with the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) Legislation, taking occupational health and safety measures.

Another notable objective in the preschool education program is the "Takes measures regarding health" objectives. With this objective, the aim is to develop children's attitudes toward protecting their health through indicators such as health protection, balanced nutrition, and sleep.

Results, Discussion, and Conclusion and Recommendations

The analysis reveals that in the outcomes of occupational health and safety in preschool, primary, and secondary education curricula, there is a focus on specific units related to the subject. When examining the educational programs, it is notable that health, safety, and the concept of danger are emphasized in the preschool education program. These objectives are considered significant in fostering children's attitudes toward health protection and instilling safety awareness.

The examination of primary education programs indicates an attempt to establish fundamental objectives in terms of occupational health and safety, as well as to create a culture of health and safety for students in grades 1, 2, 3, and 4. However, it is understood that these objectives in primary school are insufficient in middle and high school levels, leading to an evaluation that there is a lack of continuity in awareness building. Ensuring the continuity of these objectives at all levels will contribute to instilling healthy and safe habits, thus making a contribution to a safer future. This is because instilling a sense of responsibility for both one's own safety and the safety of others is established at a young age in children. In the professional world, a fundamental skill expected from employees is to exhibit awareness and behaviors that prioritize their own and others' safety. Indeed, when the literature in the field is examined, it is commonly expressed that the reasons for workplace accidents often stem from human errors (Sanders, 1983; Guo, Youchao and Flight, 2020). Inexperience and inadequacy are also among the most dangerous causes of workplace accidents (Yılmaz and Turan, 2023).

Domino theory, pioneered by the influential researcher Heinrich in 1936, explains that 88% of workplace accidents are attributed to human error (Heinrich, 1936). Therefore, it is necessary to develop educational curricula targeting children and young people based on the assumption that a significant cause of workplace accidents is attitude or behavior. Exposure to occupational health and safety (OHS) education programs at an early age in schools contributes to individuals experiencing the benefits of this education throughout their lives (Lavack et al., 2008). These experiences can lead to safer work behaviors, increased competence in high-risk occupations, and the ability to assess and make decisions about risks. Such experiences can be integrated into existing courses in OHS programs. For example, in British Columbia high schools, drama games have been developed that allow students to share their OHS experiences with their peers (Van Den Broek, 2004). It is noted that more engaging methods have an impact on risk acceptance and intended safety behaviors in students (Rodrigues et al., 2018). Additionally, OHS education in high schools can benefit from an interesting approach involving case studies (Pisaniello et al., 2013). The role of schools becomes especially crucial in imparting basic knowledge and skills for a safe workplace to young individuals. Given that changing behavior according to safety attitudes may be easier, it is recommended that safety education interventions target behavior (Thamrin, Pisaniello & Stewart, 2010). School-based OHS education programs are seen as a fundamental intervention strategy to prevent injuries among young workers (Balanay et al., 2014). When examining vocational high school curricula, a total of 173 outcomes were identified across 32 fields. However, it is noted that in some fields, the majority of identified outcomes are related to compliance with occupational health and safety (OHS) rules. It is observed that only in the Construction Technology field, there is a specific course titled "Construction Health and Safety" in the curriculum. The outcomes identified for this course, which contains content related to occupational health and safety, are believed to create awareness among students regarding safety culture. The objective of the course, as stated in the curriculum, emphasizes the need to implement OHS measures and impart knowledge and skills in the field. Therefore, it is evident that some courses provide information about OHS rules in the initial units. It is noteworthy that there is no separate course specifically dedicated to occupational health and safety in vocational high school programs across various fields.

In our country, there is no mandatory certification requirement for occupational education teachers in Occupational Health and Safety (OHS). Nevertheless, significant roles have been assigned to vocational education teachers in developing a safety culture. It is assumed that teachers have OHS competence; however, in some cases, vocational and technical education teachers may have received very little or no OHS training (Schulte et al., 2005). Particularly in institutions providing vocational education, the inclusion of OHS not only as a unit within a subject but as a separate course in all fields is crucial for imparting OHS awareness in pre-professional education. Active participation in practical applications and workshop activities during vocational education contributes to reducing accidents by increasing the awareness of dangers and risks for vocational high school students. Individuals who have gained awareness are less likely to engage in unsafe behaviors. The literature indicates that a lack of awareness regarding job-related hazards can lead to a higher risk of injuries among young workers in the workplace (Miller and Kaufman, 1998; Linker et al., 2005). Studies suggest that safety awareness has a positive impact on behaviors related to occupational safety (Dursun, 2013). Achieving safety awareness can be realized through effective education on OHS from primary school to university level (Koçak and Koray, 2018). Therefore, OHS topics should be part of the school curriculum (Burgos-Garcia, 2007). The primary objective of including OHS topics in the curriculum is to equip students with the knowledge and skills to cope with hazards they may encounter in the workplace (Rodrigues et al., 2018). It is emphasized that considering the type of school when determining curricula will be effective in safety behaviors and safety commitment dimensions. Furthermore, it is recommended that existing injury and illness risks, past accidents, and the opinions of students and teachers be taken into account for the integration of Occupational Health and Safety (OHS) topics into education in these institutions (Schulte et al., 2005). When examining official sources where statistical information is published, these findings were not encountered. However, some publications or reports provide information, especially about accidents encountered in vocational education institutions. In a study addressing agricultural injuries among students participating in the agricultural science program in rural California's Central Valley state schools, it was found that there is a significant relationship between risky attitudes toward farm safety and injuries. The study also concluded that injuries caused by motor vehicles and

machinery are more common among males. An interesting result is that the injury risk in this group of students is higher compared to other young people living or working on the farm (McCurdy, Xiao, H., & Kwan, 2012). This situation may be attributed to a lack of knowledge in OHS topics. In the literature, it is stated that due to a lack of knowledge about OHS topics, young workers are at about twice the risk of job-related injuries compared to adults (National Institute for Occupational Safety and Health—NIOSH, 2003; Hard & Myers, 2006). It is expected that OHS training programs should be more instructive than informative. Otherwise, it is evaluated that the existing programs may fail in the implementation of safety knowledge (Chin et al., 2010).

The integration of health and safety into education will contribute to the formation of positive behavior changes related to safety and health in children. The statistics on occupational accidents and occupational diseases in our country are indicators of inadequate development in safety culture. Considering that the development of a safety culture will enhance the overall level of development in our country, it is crucial to allocate sufficient space in the education curriculum for Occupational Health and Safety (OHS) topics. It is recommended to prepare OHS objectives that enable students to understand legal requirements, create a safety culture, and develop the skills to assess risks and make safe decisions for their safety and health. When giving form to the curriculum, a separate course content covering fundamental OHS topics should be created, taking into account sectoral needs, and added to the curriculum. Especially in vocational education programs, it is suggested to add practical programs in collaboration with occupational safety experts and industry representatives to assess potential hazards in the workplace. Regulations should be made to ensure that basic OHS courses in educational institutions are taught by experts in the field. For future research, it might be advisable to compare international curricula by examining them in subsequent studies.

Ethics Committee Approval: Since the data of the study are obtained from the of curriculum documents published by the Ministry of National Education for preschool, secondary education, high school, and vocational education levels this research does not require an ethics committee approval document.

Informed Consent: K-12 curriculum documents published by the Ministry of National Education were used as the data source in the study. Since no data is collected from individuals, there is no consent form.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – Ö.K., P.B.; Design – Ö.K., P.B.; Supervision – Ö.K.; Resources – Ö.K.; Materials – Ö.K.; Data Collection and/or Processing – Ö.K.; Analysis and/or Interpretation – Ö.K., P.B.; Literature Search – Ö.K.; Writing Manuscript – Ö.K., P.B.; Critical Review – Ö.K., P.B.; Other – Ö.K., P.B.

Declaration of Interests: The authors declare that they have no competing interest.

Funding: The authors declare that this study had received no financial support.

Etik Komite Onayı: Araştırmanın verileri Millî Eğitim Bakanlığı'nın yayınladığı K-12 müfredat dokümanlarından elde edildiğinden bu araştırma için etik kurul onay belgesi gerekmemektedir.

Katılım Onamı: Çalışmada veri kaynağı olarak Milli eğitim bakanlığı tarafından yayınlanan K-12 öğretim programı dokümanları kullanılmıştır. Kişilerden veri toplanmadığı için onam formu bulunmamaktadır.

Hakem Değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Fikir – Ö.K., P.B.;Tasarım – Ö.K., P.B.; Denetleme – Ö.K.; Kaynaklar – Ö.K.; Malzemeler – Ö.K.; Veri Toplanması ve/veya İşlemesi – Ö.K.; Analiz ve/ veya Yorum – Ö.K., P.B.; Literatür Taraması – Ö.K.; Yazıyı Yazan – Ö.K., P.B.; Eleştirel İnceleme – Ö.K., P.B.

Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Finansal Destek: Yazarlar, bu çalışma icin finansal destek almadıklarını beyan etmişlerdir.

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