Occupational Health and Safety in Schools: Investigation of Risks and Precautions via School Administrators' Experiences

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Abstract

This research aims to reveal the risk factors that may emerge in schools and how to take precautions based upon the experiences of school administrators. A total of 15 school principals and 22 assistant principals working in kindergarten, primary, secondary and high schools in Turkey participated in this study. Research data were collected with semi-structured interviews and examined with content analysis. Findings revealed risk factors such as: plug sockets; doors and door handles; cabinets and sharp-edged items; stairs, stairwells and garden floors; elevators, equipment; windows and window glasses; goal poles for basketball and volleyball; lack of training; school environment; old buildings; garden walls and fences; cleaning materials and chemicals; lack of knowledge about emergency response, chronic diseases, and ailments; risky games; substance abuse; peer bullying; laboratories. Implications are provided about how to make school environments healthier and safer.

Keywords: occupational health and safety, OHS, hazard, risk, precaution, school administrators

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Introduction

With the increasing concern in the world for the health, safety and welfare of people in the workplace (Cox, 1988) and the development of the social state understanding, governments have started to create legal regulations for institutions to take the necessary measures on occupational health and safety (Arpa & Çakı, 2018). The issue of occupational health and safety is increasingly emphasized today given that the rates of occupational accidents and occupational diseases are at significant levels. It is, therefore, of great importance to reduce and prevent risks that may arise (Karacan & Erdoğan, 2011; Lundstrom et al., 2002; Uçkun et al.,2015). Determination and implementation of measures based on scientific studies in order to minimize the losses caused by occupational diseases and work accidents have become critical for the protection of institutions and employees from all kinds of hazards (Özkılıç, 2005). Nowadays, the number of international researchers and practitioners who are interested in reducing occupational health and safety (OHS) problems and threats in the workplace and improving individual and organizational health is increasing (Burke, 2019). OHS is vital to all organizations including schools and universities (Hughes & Ferrett, 2016).

School climate without violence, fear and anxiety is needed so that students, teachers and school staff can focus on education and training in a safe school environment and prepare for the future (Alver et al., 2016). One of the most basic conditions for the realization of learning in schools at the desired level and for achieving educational goals is to provide an educational environment where students and school personnel feel safe (Özer & Dönmez, 2007). Feeling safe at school can have positive effects on academic success and mental health among students, increasing classroom participation (Côté-Lussier & Fitzpatrick, 2016). Various studies have shown that the school climate, in which students feel safe, contributes positively to their

academic success and well-being (Cooper, 2013; Davis & Warner 2018; Kutsyuruba, Klinger & Hussain, 2015). Schools can start initiatives towards a healthy school environment for safe learning by making communication and relationships stronger between school stakeholders (students, parents, teachers, administrators), encouraging high academic expectations, and engaging families and students inside and outside the classroom (Davis & Warner 2018). It is predicted that the importance given to school safety in recent years will continue to rise in the future (Reid, 2020).

From time to time, accidents, diseases and even losses may occur in schools due to unhealthy and unsafe conditions. In order to prevent these undesirable situations, it is of vital importance to take protective measures in schools before accidents and diseases occur (Kök Sevdalı, 2019). Safety and health practitioners can consider taking a systems approach to mitigate risks. To reach acceptable risk levels, attention must be paid to hazards and risks in the system (Manuele, 2019). Hazard, in terms of health and safety, is any situation that has the potential to cause harm or damage (Baggett & Collins, 2013). Risk, on the other hand, refers to the probability of injury, damage or loss (statistical chance) (Laszcz-Davis, 2019). Similarly, risk can be thought of as the probability of adverse effects arising from an event or activity (Taylor et al., 2004). However, while the word 'risk' can be replaced by chance and probability, it can be used synonymously with hazard and threat in other situations (Rausand & Haugen, 2020). In this research study, the word risk is used synonymously with hazard.

Recent studies regarding occupational health and safety in schools cover topics such as trends and improvement strategies for ensuring school safety and preventing violence (Cohen, 2021); monitoring and improving the well-being and health of school administrators (Riley et al., 2021); disaster preparedness and safety school model (Widowati et al., 2021); school safety in

terms of occupational safety practices (Kandemir & Argon, 2020); school leaders during the Covid-19 pandemic (Pollock, 2020); occupational health and safety in national education (Van & Koç, 2020); occupational health and safety practices of school administrators and the problems that they face (Kök Sevdalı, 2019); consideration of risk factors and warning signs, determination of concerns, follow-up practices (Louvar Reeves & Brock, 2018); building schools' readiness for school safety (Kingston et al., 2018); occupational health and safety education, problems and solution recommendations (Ceylan, 2012); safety in secondary education organizations (Turhan & Turan, 2012); and the development of school safety research (Astor et al., 2010). It is challenging to examine all the factors that may influence the formation of health and safety at school and to take measures to reduce the negative effects of these factors (Özer & Dönmez, 2007). Therefore, the author of the present study, with the experience and observations he gained while he was working as a school administrator in charge of occupational health and safety, considers it significant to bring together possible risks and precautions in schools according to school levels based on the experiences of administrators, and so each study can contribute to occupational health and safety in schools. However, the literature shows that the number of studies with school administrators on occupational health and safety in schools is very limited. Apart from vocational and technical schools, it is seen that there is no study that deals with possible risk factors and measures for them according to school levels with school administrators.

The present research aims to determine the occupational health and safety risks in schools and to reveal the precautions that may prevent these risks from the vantage point of school administrators and the observations of the author. Therefore, it is expected that the research can contribute to the elimination of deficiencies by focusing on possible risk factors that may occur

in schools. Answers to the questions *"What are the risk factors faced by school administrators in kindergarten, primary, middle and high school within the scope of occupational health and safety? How can these risks be avoided?"* are sought in line with the purpose of the research

Method

Research Design

This research was conducted as a case study; a qualitative research approach in which the researcher gathers detailed information regarding real life, a current situation or cases in a certain time, and describes the situation and reveals themes (Creswell, 2013). In case studies, answers are sought to the questions of 'how' and 'why' (Yin, 2018). This study focuses on how to make schools healthier and safer by defining and preventing the risks. Thus, the research approach collected detailed information about the occupational health and safety risks that may emerge in schools and how to take measures against them.

Participants

The study group of the research consists of school principals and assistant principals working in kindergartens, primary, secondary and high schools in Nilüfer, Osmangazi and Yıldırım districts of Bursa province in Turkey. The participants were determined by purposive sampling method. Hereby, it was aimed to reveal the possible risks for schools from multiple perspectives. The participants were randomly selected from volunteers to participate in the research. Demographic information about the participants is presented in Table 1.

Table 1

Demographic Information Regarding Participants

Ps	Position	Gender	School Type	Total Number of Students	Total Number of Personnel	Teaching Seniority (year)	Administrative Seniority (year)	Number of Schools Worked
M1	Principal	Female	Kindergarten	51-100	11-50	11-15	6-10	1-5
M2	Principal	Male	High	101-500	11-50	11-15	6-10	1-5
M3	Principal	Male	Primary	101-500	11-50	11-15	6-10	6-10
M4	Principal	Female	Secondary	1001-1500	51-100	11-15	6-10	1-5
M5	Principal	Male	Secondary	101-500	11-50	11-15	6-10	1-5
M6	Principal	Male	Primary	1-50	1-10	11-15	6-10	6-10
M7	Principal	Male	Secondary	101-500	11-50	11-15	1-5	1-5
M8	Principal	Female	Kindergarten	101-500	11-50	11-15	6-10	6-10
M9	Principal	Male	Primary	501-1000	11-50	11-15	11-15	11-15
M10	Principal	Male	Secondary	1001-1500	51-100	21-25	16-20	6-10
M11	Principal	Male	Secondary	1501-1700	101-120	30 and above	16-20	1-5
M12	Principal	Male	Secondary	1501-1700	101-120	30 and above	21 and above	6-10
M13	Principal	Male	High	501-1000	11-50	21-25	6-10	1-5
M14	Principal	Male	Primary	1001-1500	51-100	16-20	6-10	1-5
M15	Principal	Female	High	501-1000	11-50	11-15	1-5	1-5
MY1	Asst. Principal	Male	High	501-1000	11-50	11-15	1-5	1-5
MY2	Asst. Principal	Male	High	501-1000	11-50	21-25	11-15	11-15
MY3	Asst. Principal	Male	High	101-500	11-50	5-10	1-5	1-5
MY4	Asst. Principal	Male	Secondary	101-500	11-50	5-10	1-5	1-5
MY5	Asst. Principal	Female	Secondary	501-1000	11-50	5-10	1-5	1-5
MY6	Asst. Principal	Female	Kindergarten	50-100	11-50	21-25	6-10	6-10
MY7	Asst. Principal	Female	Kindergarten	50-100	11-50	11-15	1-5	1-5
MY8	Asst. Principal	Male	Kindergarten	101-500	11-50	16-20	6-10	6-10
MY9	Asst. Principal	Female	Secondary	1001-1500	51-100	30 and above	11-15	11-15
MY10	Asst. Principal	Female	Secondary	1001-1500	51-100	30 and above	16-20	6-10
MY11	Asst. Principal	Female	High school	501-1000	51-100	11-15	11-15	6-10
MY12	Asst. Principal	Male	Primary	1001-1500	11-50	11-15	6-10	6-10
MY13	Asst. Principal	Female	High school	501-1000	51-100	11-15	1-5	1-5
MY14	Asst. Principal	Male	Secondary	1501-1700	101-120	5-10	1-5	1-5
MY15	Asst. Principal	Female	Secondary	1501-1700	101-120	21-25	16-20	6-10
MY16	Asst. Principal	Male	Secondary	1501-1700	101-120	11-15	6-10	1-5
MY17	Asst. Principal	Male	Secondary	1501-1700	101-120	21-25	6-10	1-5
MY18	Asst. Principal	Female	High	501-1000	11-50	5-10	1-5	1-5
MY19	Asst. Principal	Male	High	501-1000	11-50	16-20	11-15	6-10
MY20	Asst. Principal	Male	High	501-1000	11-50	16-20	1-5	6-10
MY21	Asst. Principal	Male	Primary	501-1000	11-50	21-25	11-15	6-10
MY22	Asst. Principal	Female	Primary	50-100	1-10	16-20	6-10	1-5

Table 1 indicates that the school administrators participating in the study provide sufficient diversity in terms of position, gender, school type, total number of students, total number of personnel, seniority of teaching, seniority of administrating and the number of different schools worked.

Data Collection and Analysis

The data of the research were collected with a semi-structured interview form. This form consisted of two parts, including demographic information of the participants and interview questions. The demographic information section of the form was intended to obtain information about the participants which is presented in Table 1. In the second part, there were interview questions about what school administrators perceived as occupational health and safety risks in schools and what precautions were needed. The interview questions were reviewed by two experts in the field of education administration and an OHS expert, and then the questions were edited before the interviews. Additionally, the study was also informed by two-year longitudinal observations by the author who was a school administrator responsible for occupational health and safety. Observation can be used as a data collection tool in any social or institutional setting that the researcher deems appropriate (Yıldırım & Şimşek, 2011). The author took note of the factors when observing possible risks regarding OHS in a school setting, and presented this knowledge and experience throughout the research.

In order to collect the research data from the school principal and assistant principals, interviews were conducted with the study group specified in Table 1. Some of these interviews were completed face-to-face and some by phone or Zoom. The interviews lasted approximately 35-50 minutes. Notes were taken during the interviews and inputed to the computer. In the coding of the research data, abbreviations such as M1, M2 for school principals and MY1, MY2 for assistant principals were used. Content analysis technique was used to examine the data. The content analysis can help the concepts and relationships explain the collected data (Yıldırım & Şimşek, 2011). In this study, the data obtained from the school administrators were integrated by

first presenting the situations related to each other under risks as themes, and then explaining the measures related to these situations.

Reliability and Validity

Validity and reliability are considered in terms of ensuring the credibility of the qualitative research (Lincoln & Guba, 1985). The views of the participants are given with direct quotations when necessary in order to increase credibility. Principals and assistant principals as school administrators were selected from different school levels (kindergarten, primary school, secondary school, high school) and worked in different schools. In addition, the number of students and staff in the school where they work varied, as well as the differences in the seniority of teaching and administrating of the participants. In addition to these, female school administrators were included in the study as much as possible, thereby increasing the variety of perspectives and data. To ensure data control before the analysis, member checking data confirmation was conducted by 12 participants (3 school principals and 9 assistant principals). Finally, the findings were presented to two OHS experts for thematic analysis. Thus, the themes and suggestions within the scope of the research were checked and the study was examined as a whole. Experts stated that the study was appropriate in terms of occupational health and safety practices.

Results

In this section, answers to the following questions, which were created in line with the purpose of the research, were sought within the scope of occupational health and safety: *"What are the risk factors faced by school administrators in kindergarten, primary, middle and high school within the scope of occupational health and safety? How can these risks be avoided?"*

Factors that school administrators consider as risks within the scope of OHS in kindergartens and their views on how to prevent them are presented in Table 2.

Table 2

OHS Risk Factors and Measures in Kindergartens

Risks	Measures	Participant
Fall, bump and stairs	Protection tape or sponge to the corners, use of curved materials instead of pointed angular materials, window protections against fall, building schools single-story, railings and nets to stairs, non-slip tape on stairs	M1, MY6, MY7, M8
Pandemic, disinfectant	Attention to mask and hygiene; disinfectant use under teacher control	MY6, MY7, MY8
Plugs	Positioned high and protected from children's reach	M1, M8, MY8
Door and door Handles	Door opening with controlled mechanisms, flat plastic door handles	MY6, MY7
Only one exit	Building emergency exit doors	M1, M8
Cabinets and items	Fixed to the wall and not high, goods that do not exceed the student height	MY7, MY8
Floor	Soft floor like flex or wooden parquet instead of concrete, not using carpets for hygienic reasons	M8, MY6
Boiler room	Building it away from school building	M8
Truancy	Teacher control	M1

As shown in Table 2, risk factors in kindergartens can generally include falls and bumps in sharp goods or wall corners, stairs, windows, etc. In addition, it has been stated that disinfectant, plugs, doors and door handles, single entrance to the school, cabinet, carpet, and floors can be risky in kindergartens. In this context, M1 shared her measures as "... protective tape or sponge can be placed to the corners; non-slip tape on the stairs" while MY7 stated "... using security locks in windows; preferring curved items over sharp ones..." Some of the statements of other school administrators are as follows: MY6, "disinfectants must be locked in the closet or used under teacher control"; MY8, "items should not be too high [to guard] against children climbing and must be fixed to cabinets…"; M8 and MY8, "electrical outlets must be protected." M1 discussed precautions for risks associated with the expression of "plugs should be

located high," while MY6 and MY7 indicated that door opening mechanisms should be arranged to prevent rapid closing and door handles must be flat. Kindergarten school administrators have also highlighted some measures such as schools having multiple entrances and exits, having the boiler room in a separate place, having the bolt of the outer door up, and covering the floor with flexible or wooden material instead of carpets.

Second, the experiences of school administrators within the scope of OHS risk factors and measures in primary schools are revealed and presented in Table 3 below.

Table 3

OHS Risk Factors and Measures in Primary Schools

Risks	Measures	Participant
Doors and door handles	Door fixing mechanisms for only teacher use, flat door handles	M3, M6, M14, MY11
Stairs, windows and sinks	Non-slip tape on the stairs or anti-slip section-hollow, safety lock on the windows, appropriate sinks to age groups	M3, M14, MY11, MY21
Fall, bump and floor	Warnings, teacher preparation with first aid for students' falls, the floor should be soft material, non slippery ground	MY11, M6, M3, MY4
Number of floors	The school should be in a large area, and each class level should be in a separate building; buildings should have a maximum of 2 floors, horizontal architecture instead of vertical	M9, MY11, MY22
Pandemic, disinfectant	Following mask, distance and hygiene rules, storage of disinfectant in teacher's locker	M9, MY4
Cabinets	Embedded into or fixed to the wall	M3, MY4
Canteen	Healthy foods for children and regular inspection of the canteen	M6, M9
Electrical outlets	Electrical outlets are protected, locked	M6, M14,
Vehicle entry, density at exits	Vehicle entry into the school is blocked during school time, students go out under teacher control in crowded schools	MY21
Heating stove	Cage around the stove, cleaning of stoves, pipes, chimneys	MY22

OHS risks in primary schools listed in Table 3 include: door and door handles; stairs, windows and sinks; fall, impact and ground; and the number of floors and others. Accordingly, for the risks associated with the door: M3 said, "... mechanisms must be installed so that the doors can be fixed to the wall when the teacher leaves the classroom for young-aged students"; M6 stated that, "door handles should be embedded" and MY14 stated that, "door handles should be

replaced with flat ones.” Additionally, several administrators expressed concern about water causing slip and fall accidents. In the words of MY21, "sinks should be cleaned and the wet floors must be dry for next break.” MY11 evaluated some situations for falls and bumps such as "in case of possible accidents, the response team, the staff may be untrained. Even if the staff is trained, they can freeze when something bad happens...." Therefore, "training and exercise frequency should be increased" were emphasized by the M6 and M3 in order to be prepared. On the other hand, MY22 shared the view that, "primary schools should be built with horizontal architecture, not vertical architecture, and have one floor.” MY4 listed his suggestions as follows: "coating floors with materials that are not too hard such as wood; frequent warnings should be given to students about masks, distance, hygiene; disinfectant should not be left out without teacher supervision; cabinets should be fixed to wall.” Emphasizing the importance of canteen inspection, M9 mentioned:

> recently it appeared in the news, that a student died as a result of the syringe chocolate cap sold in the canteen going into the student's windpipe. So, canteen inspections should be carried out frequently and special products should be produced for schools.

M6 also emphasized the protection of the sockets. MY21 stated that, "school exits should be in order and under teacher control, and vehicle entry should be prevented during school time...” Finally, for schools with stoves, MY22 stated her recommendations for risks such as "the heating stove must have protective parts, and the necessary cleanings for stove parts and ventilation should be carried out properly.”

Third, the experiences of school administrators within the scope of OHS risk factors and measures in secondary schools are revealed and presented in Table 4 below.

Table 4

OHS Risk Factors and Measures in Secondary Schools

Risks	Measures	Participant
Stairs, stairwell and garden floor	Non-slip tape, warning sign, net across stairwell, providing the appropriate floor and space for the physical education course, soil and grass instead of concrete for garden floor	M5, M7, M11, M12, MY5, MY10, MY14, MY17
Bringing dangerous goods	Identifying and taking precautions against smoking, lighters, sharp tools that may cause injury, variable interval control	M7, MY5, MY16
Plumbing, boiler, elevator, equipment	Maintenance and repair of electrical, water, fire extinguisher, fire tube, boiler, elevator, classroom equipment	M5, MY9, MY17
Desks, boards and cabinets	Fixing all the boards and cabinets to the wall, preferring curved materials instead of sharp, angular ones	M7, M11, M12
Windows and glasses	Replacement of broken, cracked windows, not using glass in classroom cabinets, window or cabinet glasses resistant to breakage	MY5, MY9, MY17
Epidemic or pandemic	To provide and implement the requirements of school health procedures, to follow the diseases of students and staff	M4, M5, M7
Doors	Installing mechanisms for slow opening and closing of all doors in the school, control of door hinges	MY10, M11
Goal, basketball etc. poles	Checking their stability and endurance	M11, MY17
Lack of training	To provide training to students, teachers and all staff on occupational health and safety	M10, MY10
School exits and school environment	Ensuring control by security personnel to prevent density or fights	M11, MY16
Old buildings	Making physical improvements or renovating old schools	M10, MY17
Garden walls and wires	Avoiding the use of barbed wires, different measures to prevent student truancy or outsiders	MY15, MY17
School entrance	Creation of security points and security turnstiles in overcrowded schools	MY10
Cleaning materials and chemicals	Cleaning materials and chemicals must be kept closed, locked out of the reach of the student	MY9
Crowded classrooms	Increasing the number of classrooms with building new schools	M12
Chronic diseases, disorders, lack of information about emergency response	To know if all students and employees have any ailments, to take the necessary precautions, to have medical personnel in the school	MY9
Canteen	Regular and frequent inspections in terms of hygiene and food and drink	MY5
Spare classes that the teacher is absent	Ensuring teacher supervision for these classes. Assigning a teacher on duty or available to classes	MY17
Risky games	Training against bullying games such as throwing in the air, chasing, and controlling with teachers	M4

In Table 4, the situations that stand out as OHS risks in secondary schools are about stairs, stairwells and floors; bringing dangerous goods to school; plumbing, boiler, elevator, equipment; rows, boards and cabinets; windows and glasses; epidemic or pandemic; doors; goal poles for basketball etc.; lack of training; school exits and school environment; old buildings; and garden walls and wires. In addition, cleaning supplies and chemicals, crowded classrooms and lack of knowledge about chronic diseases, disorders and emergency response, canteens, spare classes and risky games are also seen as risks by secondary school administrators. In this context, M11 said, "Stairwells should be protected via a net and non-slip tape should be placed on the stairs." M12 stated, "... soil and grass should be the placed in gardens [to guard] against falls and injuries.." According to MY5, the statement "dangerous goods are brought to the school... with variable intermittent control..." was critical. M5 thought, "it is vital that the necessary maintenance repairs for plumbing, elevators, etc. are carried out in a timely manner." MY17 mentioned "regular control of the poles and goalposts in the schoolyard against falls" while M7 stated that "all cabinets and boards in schools should be affixed." M12 shared that "desks should be curved" while MY9 advised that "all windows in schools must be resistant to breakage."

MY10 told an anecdote that "doors must have mechanisms that close slowly. I witnessed a student's finger break as a result of getting stuck in the door." So, accidents reveal the importance of these issues. Regarding the breaks, M4 shared that "... all procedures must be followed, and it is of great importance that everyone follows the health and safety rules." In addition, MY9 also explained that "students' chronic diseases or lack of knowledge about responding to an emergency can be seen as a risk to the health of those students, so medical personnel may be assigned to schools for this situation." Similarly, M11 said that "risks

associated with school exits and surroundings can be ensured with security personnel to the places necessary."

Finally, the experiences of school administrators within the scope of OHS risk factors and measures in high schools are revealed and presented in Table 5 below.

Table 5

OHS Risk Factors and Measures in High Schools

Risks	Measures	Participant
Stairs, stairwells, window, floor	Non-slip tape on the stairs, protective net for the stairwells, safety apparatus to prevent falling from the windows, warning signs	MY1, MY3, M13, MY19, M2, MY20
Substance abuse	Raising awareness, setting good examples and providing support	M2, M13, M15, MY19
Epidemic or pandemic	Warnings about masks, distance, hygiene, taking necessary precautions	M2, MY1, MY13
Breaks and teacher absent classes	Planned appointments of available teachers for classes	MY2, MY13
Machinery, installation, maintenance/repair	Periodic inspection, maintenance and repairs for boilers, elevators, electrical installations, etc. Requesting a budget for appropriate risks rates from the occupational health safety module	MY11, MY20
Bringing dangerous tools to school	Creation of control mechanisms for the removal of cutting, piercing, flammable, electric tools	MY1, MY3
Peer bullying	Organizing training and activities to prevent bullying	MY2
Parents' interventions with other students	Solving the problems between students in school, minimizing family interventions	MY18
School entrances and exits	Control of school entrances and exits with security personnel where necessary, preventing foreigners from entering the school	MY3
Canteen- food and drinks	Following hygienic rules, checking the storage conditions of products that will deteriorate quickly	M15
Laboratories	Taking precautions such as goggles, aprons, eye showers, showers. Storing and locking chemicals properly	MY11

The OHS risks in high schools in Table 5 are related to stairs, stairwells, windows, floors; substance abuse; epidemic or pandemic; breaks and teacher absent classes; machinery, installation, maintenance/repair; bringing dangerous tools to school; peer bullying; parents' interventions with other students; school entrances and exits; and canteen food and drinks; laboratories. Among the participants who expressed the measures to be taken against the related

risks: M13 said "non-slip tape on stairs and nets should cover the stairwells..."; MY19 expressed "... classrooms need to be ventilated properly, besides a safety apparatus should be installed to prevent falling"; and M2 stated "warning signs should be placed in the necessary sections such as wet floors, electrical installations, etc." MY19 considered substance abuse as a risk in high school students and asserted "... awareness-raising activities can be carried out in schools and support should be provided to students with substance abuse to help them quit." M2, MY1 and MY13 emphasized the importance of mask, distance and hygiene in epidemic or pandemic situations, while MY2 and MY13 pointed out that possible risks about teacher absence from classrooms can be avoided with the support of other teachers. MY2 suggested psychological support to the victims, school rules and training to prevent peer bullying. Furthermore, MY18 mentioned that the inclusion of families in the problems experienced among students will make the events complicated and stated "... problems between students can be solved at school first according to the situation...." MY13 indicated security personnel and inspections as a key measure, "to prevent bringing dangerous tools being brought to the school, and problems at school entrance and exit." Finally, M15 emphasized "the conditions of preservation of foods sold in the canteen...", and MY11 shared the measures needed in the laboratories.

Discussion and Conclusion

The present research, risks and precautions are discussed on the basis of the experiences of school administrators to ensure occupational health and safety in schools. At the end of the research, possible risks are revealed according to school levels and the measures to be taken against them can be considered holistically with the thought that they will complement each other.

First, risks for kindergartens are expressed by the administrators working in these schools as follows: falling, crashing and stairs; epidemic, pandemic and disinfectant; sockets; door and door handles; single entry-exit to school; cabinet and furniture; ground; boiler room; truancy. Then, primary school administrators express the following risks: doors and door handles; stairs, windows; sinks; falling, crashing and ground; number of floors; epidemic, pandemic, and disinfectant; cabinets; canteen; electrical outlets; density of vehicles entering and exiting the school; heating stove. Next, in secondary schools, the risks that administrators see are about stairs, stairwells and garden floors; bringing dangerous goods; plumbing, boiler, elevator, equipment; desk, board and cabinets; windows and glasses; epidemic and pandemic; doors; goal and goal posts; lack of training; school entrance, exit and school environment; old buildings; garden walls and wires; foreigners entering the school; cleaning supplies and chemicals; crowded classrooms and dual education (full day schools); chronic diseases, ailments, lack of knowledge about emergency response; canteen; lessons when teachers are absent; risky games. Last, the risks stated by school administrators working in high schools are listed as follows: stairs, stairwells, windows, floors; substance abuse; pandemic-Covid 19; breaks and classes when teachers are absent; machinery, installation, maintenance/repair; bringing dangerous tools to school; peer bullying; interventions by parents with other students; school entrances and exits; canteen - food and drink; laboratories.

It is important to investigate these risks one by one and take measures for safe and healthy schools. In this context, schools can make self-assessments to prepare for multiple hazard threats such as those arising from natural disasters, the absence of a security system, and acts of violence against children (Widowati et al., 2021). Students in these school levels are of differing physical and cognitive abilities. Therefore, issues should not be summarized generally

but rather investigated and remediated with the unique attributes of children in each building level.

In a similar study (Kök Sevdalı, 2019), falling (window, roof, etc.), poisoning (smoke, food, milk, mercury, etc.), falling pieces from the ceiling, the door handle being stuck in the student's arm, fire in the electrical panel, the overturning of the goal post, and school bus accidents have been grouped as various accidents that occur in schools. The problems encountered in occupational health and safety in schools were expressed as the absence of fire warning system, windows that do not open halfway, the absence of safety nets on the stairs, electrical sockets with child protection, and the drinking water analysis and periodic controls (electrical installation, machinery) in schools. In another study conducted with school administrators (Çay, 2019), the possible risks and dangers are listed as the absence of window locks, electrical outlets, slippery floors, and pointed corners of the tables and the precaution of placing warning signs against these risks are emphasized. In the same research, administrators state that afixing school cabinets to the wall, installing a fire alarm system, constructing a ramp for the disabled, and the training given to administrators and teachers are essential. As a matter of fact, occupational accidents, which seem unlikely to be solved by traditional methods such as legislation and auditing, are a multidimensional problem and are mostly caused by human-induced reasons. Therefore, education and training have an important place in occupational health and safety (Ceylan, 2012). In a study (Memduhoğlu & Taşdan, 2007), problems related to school safety are discussed, and the study lists problems such as violence, use of tools and equipment, school environment (space), natural disasters, fire and accidents, and mentions about the necessary precautions for creating a safe school. However, in the research study by Kök Sevdalı (2019), 91 school accidents occurred in primary, secondary and high school level

schools. These came to the agenda in the national media between 2013 and 2018, showing that events experienced are about poisoning, electricity, fire, neglect, service, natural disaster, carelessness, violence. According to Dönmez and Özer (2009), problems related to school safety are also bullying; theft; use of cigarettes, alcohol, drugs, inhalants; school gangs (bringing tools such as guns, knives, razors to school), crisis situations and earthquakes. In that study, approaches to solving the school safety problem are examined under the titles of police model, school climate-culture, security plan, and also focused on planning and management of crisis in schools, beside roles and responsibilities related to school safety.

The measures that can be taken to mitigate the possible risks in the scope of occupational health and safety in schools can be listed with the perspective of school levels as findings complement each other. These common risks include that flammable, caustic, corrosive chemicals and materials required for the experiment should be properly stored in locked environments. The machine and equipment must be controlled and maintained on time by authorized services. It is important to check the stability of cabinets, balustrades, sinks, plates, frames, to ensure that electrical sockets and switches are protected and stable, that electrical panels are locked, that electrical cables are not left outside, fire-fighting valves and alarms, equipment controls, and that maintenance and repairs are secured properly. Applying non-slip tape to the stairs, covering the net to prevent falling into the stairwells, fixing the protrusions that may cause falling on the school and garden floors, checking the stability of the walls, tree branches, basketball hoops, poles of goals, volleyball, school entrance-exit doors and hinges of all school doors are among the crucial precautions. Additionally, it is significant to install corner protectors on the ledges with sharp corners and risky corners of the desk, table, heater and poles throughout the school or not to use angular materials, and to fix the cabinets, bookcases and

boards to the walls. Moreover, the installation of safety locks on the windows or security panels that do not prevent ventilation due to the pandemic, the use of door mechanisms that can be fixed to the wall and opened by the teacher to prevent door slams, the installation of slow opening and closing mechanisms, replacing the protruding door handles with the ones with flat grooves embedded in the door can prevent the possible related risks in schools are helpful.

Events such as outside interventions, student fights, school gangs, physical violence between students and teachers, accidents, suicide, and theft affect the school climate negatively, threaten students and school stakeholders both physically and psychologically, and undermine trust in the school. In addition, it is necessary to create a healthy and safe school environment that the physical elements in the school do not pose a risk, and the food served and consumed at the school must be sanitary and clean (Turhan & Turan, 2012). In the studies, a series of problems related to physical activity, nutrition, tobacco and alcohol use, violence, bullying, mental health, hand washing, multiple risk behaviors and oral health are discussed in terms of students' health (Langford et al., 2014). Moreover, it has been understood that some health problems such as vision, asthma, adolescent pregnancy, aggression and violence, physical activity, breakfast, inattention and hyperactivity also affect students' motivation and learning ability (Basch, 2011). There are also studies showing that physical activity and team sports activities have a positive relationship with students' academic achievement (Fox et al., 2010). Therefore, it can be interpreted that efforts on occupational health and safety in schools may have a positive effect on students' health and safety, which in turn may have a positive effect on students' learning and academic success.

Schools need to become environments against all kinds of risks and to become places away from dangers. Since it is not possible for a single group to overcome this task,

governments, society, family and school administrations should work together (Akyol, 2015). School principals, who have the primary responsibility in the effort to reach the goals determined at the school, have difficulties in finding resources, implementing and improving the existing conditions within the scope of occupational health and safety. They also have increasing workload and legislative pressure (Cereci & Çetin, 2019). In a study that draws attention to this situation, school administrators stated that they could not allocate enough time to OHS practices due to the appropriation, legislative knowledge and workload related to OHS (Kök Sevdalı, 2019). In today's conditions, leaving the responsibility of OHS to school administrators actually makes it difficult to implement OHS in schools effectively, because it is not possible for administrators to be a professional in a specialty that requires expertise such as OHS, in addition to an increasing workload this responsibility entails. Therefore, it is of great importance for the stakeholders to work together in schools under the leadership of occupational health and safety experts.

Establishing an occupational health and safety culture in institutions is needed to follow the developments in the country and the world regarding OHS, take precautions against risks, and intervene correctly in the events that may occur (Hasanhanoğlu, 2020; Karacan & Erdoğan, 2011). In this respect, the Ministry of National Education in Turkey emphasizes that a safe lifestyle can be a part of the culture through education, and attaches importance to participation of student, teacher, parent and other staff by raising awareness in order to transform health and safety culture. There is emphasis on creating school clubs and teams regarding health and safety for creating awareness of the society and ensuring social development. The relevant regulations of Ministry of National Education suggest establishing school clubs focused to health and safety, and disaster preparedness clubs. In addition, schools can form teams for occupational health and

safety and civil defense to carry out their activities in accordance with the annual plans, under the coordination and supervision of occupational health and safety units (MoNE, 2021). It is possible to imply that school administrators are expected to make the efforts to establish the school clubs, to organize the OHS related events, and to spread the awareness of occupational health and safety to the whole school.

Limitations and Implications

Stress and burnout are given as factors that will increase health and safety risks in the workplace, and the data on the negative effects of these situations on the health of individuals both physically and psychologically have increased in recent years (Cohen, 2021; Uçkun et al., 2015). The present study, on the other hand, was carried out in order to draw conclusions that will prevent physical risks to students, teachers, non-educational staff and school administrators. Occupational safety and health risks in schools can be addressed with the psychological aspects and out-of-school settings in future research. The other limitation of this research is that it cannot provide a detailed analysis of boarding schools, schools where transportation is required, vocational and technical high schools, food-provided schools and special education schools, because these schools have their own risks and each type needs to be handled individually. Aside from these limitations, the current research results provide suggestions for policy makers, practitioners and researchers to reduce the possible risks for kindergarten, primary, secondary and high schools in general, including the mentioned schools. More detailed research can be done according to school types. Thus, possible risks can be prevented and schools can be safer and healthier for all stakeholders of schools.

To make significant improvements in OSH in their schools, school leaders must commit themselves to consult with staff, identify, prioritize, and act on key issues (OHS in School,

2017). Risk assessments, which have an important role in preventing occupational health and safety risks, are seen as the starting point of the health and safety approaches. If the risk assessment process is not done properly, it is not possible to identify or implement preventive measures (Manuele, 2019). In this context, school administrators are responsible for many duties such as education, accommodation, canteen etc., and not very familiar with the specialty of OHS. That may lead to the possibility of being blind to the risks, and not being able to notice some hazards due to working in the same environment, and not evaluating schools as an expert. (Kök Sevdalı, 2019). Therefore, in addition to OHS expert inspections, school risk assessment teams can make risk assessments at different neighboring schools and advise each other. An occupational health and safety specialist, health worker and security personnel should be assigned to every school or shared among schools in close proximity to each other. By collecting and analyzing information about accidents, diseases and near miss situations during a year, checklists and precautions can be shared with all schools in order to prevent possible risks.

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