



Assessment of School Administrators' Views Regarding the Level, Sources and Effects of Noise in School (Sakarya, Turkey Sample)*

Ceren ÇETİN**, Mehmet Ali HAMEDOĞLU***

Article Information	ABSTRACT
Received: 19.04.2022	The aim of this study was to evaluate school administrators' views on the level of noise in schools, noise sources and the effects of noise pollution. In the study, which was designed with quantitative research method, a simple survey model was used. The population consists of 1118 school administrators working in public primary, secondary and high schools in Sakarya province in the 2020-2021 academic year. 394 participants were reached using snowball sampling method. As the data collection tool, a 16-item questionnaire created by the researcher was used. The data were analyzed using statistical package software. Frequency and percentage values, arithmetic mean, standard deviation, and relative change coefficient were used in the analysis of the data. As a result of the research, administrators described the noise level in their schools as medium level. It was concluded that administrators are often disturbed by the sounds caused by the unpleasant behavior of students within the school, as well as the sounds caused by places such as construction, factories, workplaces, entertainment, and bazaars located in the surrounding area. It was determined that the administrators were aware of the effect of noise disrupting the school climate and faced the physical, physiological, and psychological negative effects of noise pollution on an individual basis.
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1. INTRODUCTION

Noise comes across as deceptive and ignored pollution in schools. However, it is necessary to evaluate noise pollution as a serious danger that threatens schools. Studies in Turkey found that noise levels in our schools were significantly above the upper limits outlined in the regulation of the Ministry of Environment and Urbanization in 2017 entitled "Protection of Buildings against Noise" and the 2018 regulation on sound insulation (Polat and Buluş-Kırıkkaya, 2004; Bayazıt, Küçükçifçi and Şan, 2011; Özbıçakçı, Çapık, Gördes, Ersin and Kissal, 2012; Şahin, Şahin and Bağcı, 2014; Abakay and Bulunuz, 2018). Since 60-75% of educational activities are based on oral communication between student and teacher (American National Standards Institute [ANSI], 2002; The Institute for Enhanced Classroom Hearing [IECH], 2018), high noise levels in school negatively affect the learning environment, decaying the school climate, preventing healthy communication and interaction (Polat and Buluş-Kırıkkaya, 2004). Because noise reduces the intelligibility of speech, in a noisy learning environment, the teacher cannot communicate what they say, and the student cannot hear what the teacher says. Furthermore, long-term health issues are known to result from the detrimental impacts of noise pollution. As a result, noise pollution constitutes a significant impediment to achieving an effective education in schools and lowers educational quality.

It's crucial to pinpoint the sources of noise in the school in order to lessen its detrimental impacts. In schools, noise pollution has a wide range of causes which can be grouped as outdoor and indoor school noise sources (Chouinard, 2003; Ikenberry, 1974). Transportation noise around the school, construction noise, industrial plant noise, and noise from entertainment and shopping places can be examples of outdoor school noise sources. Indoor school noise sources can be treated as noisy behavior of students, high-level sounds caused by ringing, announcements, equipment and devices in the school, noise from places such as the canteen, gym and music room (Bistafa and Bradley, 2000; MacKenzie, 2000; Merkit, 2019; Yee Choi and McPherson, 2005). In the Environmental Noise Assessment and Management Regulation (2010), classrooms, reading rooms, conference

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** English Teacher, Ergani Science High School, Diyarbakır- TURKEY. e-mail: crnctn94@gmail.com (ORCID: 0000-0002-8289-0718)

*** Assoc. Prof. Dr., Sakarya University, Faculty of Education, Department of Educational Sciences, Division of Educational Administration, Sakarya-TURKEY. e-mail: mhamed@sakarya.edu.tr (ORCID: 0000-0003-2833-2931)

rooms, administrators' rooms, infirmaries, laboratories, sleeping areas in kindergarten are considered noise sensitive places while courtyards, playgrounds and sport halls, ateliers, music rooms and parking lots are considered as a source of noise. Research with teachers reveals that teachers are quite uncomfortable with indoor school noise (Aydın, 2004; Tezcan and Demir, 2006; Akar, Tantekin-Erden, Tor and Şahin, 2010; Güremen, 2012; Sezer-Şenkal, 2015). In her thesis, Gürel (2007) showed that teachers think that indoor school noise is usually caused by students. In her research on noise pollution in school, Güremen (2012b) listed noise sources as sounds caused by students' noisy behavior such as talking among themselves and pulling tables/chairs and sounds caused by ventilation and lighting based on the teachers' perception and she revealed that the sources of noise that teachers are most uncomfortable with are traffic noise, noise from the side/upper/lower classrooms, the corridor, and the sports field. Outdoor school noise sources are one of the acoustic characteristics that lowers the standard of education in schools. (Gürel, 2007). The most common outdoor school noise source is likely to be transport-induced noise. Therefore, when determining the locations of school placements, transportation noise should be taken into account (Shield and Dockrell, 2002). The distance between the schools and the highway is recommended to be approximately 100 meters in this context.

Noise negatively affects educational environments both for students and teachers (Bulunuz, 2021). A high level of clamor is present in classrooms where the majority of students spend a lot of time. Students should avoid this situation because they are adversely affected by noise, according to numerous studies. These studies show that high noise levels in schools negatively affect students both in terms of health and performance. Studies examining the effects of noise on students found that environmental noise as well as classroom noise impacts kindergarteners and primary schoolers significantly (Lercher, Evans and Meis, 2003; Klatte, Wegner and Hellbrück, 2005; Norlander, Moås and Archer, 2005; Dockrell and Shield, 2006; Polat and Buluş-Kırıkkaya, 2007; Köse, 2010; Şan, 2010).

A study conducted between 2003 and 2006 with 1,048 students aged 8-14 randomly selected in Germany showed that traffic noise heard from home is a source of stress that can affect blood pressure in children (Babisch, Neuhauser, Thamm, and Seiwert, 2009). For instance, a study conducted with preschoolers by Belojevic, Jakovljevic, Stojanov, Paunovic, and Ilic (2008) discovered that kids exposed to noise at night had greater heart rates and blood pressure than children who lived in quieter environments. In another study, children who are subjected to excessive classroom noise were found to have a substantial decline in their ability to learn to read (Héту, Truchon-Gagnon, and Bilodeau, 1990). Shick, Klatte, and Meis (2000) observed that students studying in high-noise classes failed more tests than students studying in quiet classes.

There are also studies on the effect of good or bad school acoustics on learning and academic success. Shield and Dockrell (2003) noted that high background noise in schools and insufficient auditory environment of classrooms lead to difficulty in understanding and concentration in students. For example, Mackenzie (2000) in his research evaluating the intelligibility of speech in classes with and without acoustic improvement, found that children educated in classes without acoustic improvement had difficulty understanding compared to children in classes with improvements. Maxwell and Evans (2000) compared the early literacy skills of students studying in kindergarten classes with and without acoustic improvement and found that the early literacy skills of the group studying in the class with acoustic improvement were better compared to students who were exposed to loud noise in classes without acoustic improvement. Tüzel (2013) looked into the impact of noise in the classroom on understanding and memory skills by having students listen to the same texts in two classrooms, one noisy and one with acoustic improvement; revealed that the students in the classroom with the acoustic improvement understood and remembered the text better. Arslan (1988) found that primary school students aged 8-9 who were naughty and failed in a noisy classroom were smarter, better focused and successful when they were taken to a soundproof classroom.

There have been numerous studies examining the effect of background noise on students' neuropsychological development. A child's cognitive development depends on skills such as attention, memory, reading, and listening comprehension, and environmental noise can negatively affect these skills especially in children (5-11 years) in primary school (Stansfeld et al., 2005). Young children have been reported to suffer from memory loss, poor reading skills, and low motivation as a result of loud airplane noise (Evans and Lepore, 1993; Clark et al., 2006). Similar to how airplane noise affects reading ability, attention, and school attendance, other environmental noise sources, like train and automobile traffic, have been linked to similar effects (Bronzaft and McCarthy, 1975; Lukas, and DuPree, 1980; Cohen, Evans, Krantz, and Stokols, 1980; Bronzaft, 1981; Sanz, Garcia and Garcia, 1993; Romero and Lliso, 1995; Evans and Maxwell, 1997; Haines et al., 2001; Klatte, Meis, Sukowski and Schick, 2007). It was determined by Hygge (1997) that aircraft and traffic noise had negative long-term effects on children aged 12-14, but no conclusions could be drawn concerning train noise. In addition, students who live near high-traffic streets or attend schools near such roads are exposed to traffic noise, which reduces children's success rates (Van Kempen, et al., 2012). It was discovered in New Delhi (India) that the amount of noise measured in the location where the schools are located, known as the "quiet zone," is higher than the authorized maximum limit, lowering education and training quality (Hunashal and Patil, 2012).

Children who are so vulnerable to noise spend most of their days in schools, where they are exposed to loud noise. Therefore, children, especially primary school students, are among the most affected by noise pollution in schools. Children do not know the negative effects of noise, dangerous sources of noise, and how to protect themselves from them, as they have not yet completed their development. (WHO, 2016). Studies show that high noise levels in schools affect negatively students' performance. However, it is obvious that all kinds of improvement practices in schools improve children's reading and listening comprehension skills, increase motivation and increase their language abilities (Bistrup, 2002; Yee Choi, and McPherson, 2005; Bernardi and Kowaltowski, 2006; Zannin, and Marcon; 2007; Bulunuz, Bulunuz and Tuncal, 2017a).

Noise pollution in schools also affects teachers negatively. In a classroom where the noise level is high, teachers raise their voices to ensure that their speech is understandable. Increasing ambient noise by 1 dB causes teachers to increase their voice between 0.5 and 0.8 dB. In case of continuity of this condition, called the Lombard effect, occupational diseases such as focus problem, headache, irritability, ringing in the ears, sound fatigue are observed in teachers due to excessive energy consumption (Şan, 2010; TMMOB Chamber of Mechanical Engineers, 2015). For example, statistics from the US National Education Center have shown that teachers who are forced to speak by raising their voices due to noise must take two days off a year due to voice fatigue. Noise leads to health problems such as excessive fatigue, exhaustion, and high blood pressure in teachers, as well as problems with teaching and talking (Güremen, 2012a, 2012b).

In research, teachers have stated that noise is a distracting, exhausting element (Hay, 1995; Ibrahim and Richard, 2000; Akman, Ketenoğlu, Evren, Kurt and Düzenli, 2000; Folmer, Griest and Martin, 2002; Geller, Rubin, Nodvin, Teague and Frumkin, 2007). Noise pollution in school distracts teachers, reduces their motivation, causes hearing loss, makes them feel helpless to cope with noisy behavior, leads to communication problems in their private lives, reduces their sense of professional belonging, leads to retirement (Gezgin, Bulunuz and Bulunuz, 2021). These findings demonstrate the severity of the noise on teachers. Similarly, Bulunuz, Onan and Bulunuz (2021) in their research, in which Classroom Teachers Study noise sensitivity and noise coping efforts, found that teachers feel psychologically tired due to noise pollution and consider early retirement. Teachers also mentioned how their tolerance for noise declined, how they became highly sensitive to very low noise levels, how this circumstance affected their personal life, and how the noise made them physically uncomfortable.

Several studies in the field show that teachers experience noise-induced health problems, and their performance is affected negatively. For example, Bayazit, Küçükkıftıç, Yılmaz, Altun and Inan (2006) found that teachers had to speak loudly due to loud noise, and therefore experienced discomfort in the vocal cords. In their research, where Bulunuz et al. (2017a) investigated the impact of noise on teachers, a teacher said, "If this sound is too much, you are surprised or forgotten about the subject you are talking about." and emphasized noise's effect on teacher performance. In the same study, teachers complained about some physiological effects of noise, such as distraction, headache, tinnitus, reluctance, weakness. In another study, Bulunuz, Bulunuz, Taşanlı, Orbak, and Mutlu (2018) found that noise affects negatively teachers' teaching performance, thus reducing teachers' desire to process lessons as a cause of distraction.

There is also research in the literature showing that teachers are psychologically affected by noise. In a study of noise pollution at school, Bulunuz (2014) revealed that teachers are psychologically uncomfortable with noise. Enmarker and Boman (2004), on the other hand, compared how much noise bothered teachers and students in their study and discovered that teachers were more sensitive to noise than students were. They also came to the conclusion that female teachers were more likely than male teachers to experience stress and irritability.

1.1. Statement of the Problem

The noise level in schools must be kept within specific bounds in order for instruction to take place effectively. The responsibility of educational administration is to provide the physical and environmental circumstances necessary for the achievement of the objectives that will ensure the success of the school. This process in schools is the responsibility of the school administrator as an educational leader. In this context, the school administrator is the person who will plan short-, medium- and long-term improvements in their institutions and create resources for it or give priority to improving the school's acoustics, develop strategies for reducing and preventing noise, and create a vision and mission by bringing all stakeholders in the school together on this issue. Therefore, the views of school administrators on noise pollution in schools need to be known.

1.2. Purpose of the Study

It is the purpose of the study to assess the amount of noise in schools, the sources of noise pollution, and the impacts of noise pollution from the perspective of school administrators.

1.3. Problem of the Study

For this purpose, it was necessary to answer the following questions:

1. What are the administrators' views on noise levels in school?
2. What are the administrators' views on the sources of noise in school?
3. What are the administrators' views on the effects of noise pollution in the school?

2. METHODOLOGY

This quantitative study was aimed to investigate the noise level, noise sources, and impacts of noise pollution in schools based on school administrators' opinions. The survey method is employed in this investigation. This method attempts to explain a situation as it is, whether in the past or in the present (Karasar, 2012).

2.1. Participants

Due to the outbreak of Covid-19 pandemic, education system in Turkey switched to distance education mode. Data collection has gotten challenging throughout this procedure. The snowball sampling technique was applied as a result. First, an initial sample formed from the population and those participants recruit other participants. Participants are 394 school administrators working in Sakarya province's public primary, secondary, and high schools for the 2020-2021 academic year. This survey involved 76 female administrators (19.3%) and 318 male administrators (80.7%). In terms of education level, there are 271 (68.8%) administrators with "bachelor's degree" and 123 (31.2%) administrators with "graduate degree". In terms of job status, there are 193 (49%) administrators working as "principal" and 201 (51%) administrators working as "assistant principal". In terms of executive seniority, there are 143 (36.3%) administrators with executive seniority of "1-5 years", 88 (22.3%) administrators with executive seniority of "6-10 years", 163 (41.4%) administrators with executive seniority of "11 years and above". In terms of the school type where administrators work, there are 133 (33.8%) administrators working in "primary school", 107 (27.2%) administrators working in "secondary school" and 154 (39.1%) administrators working in "high school". In terms of working time in the school, there are 275 (69.8%) administrators with "1-5 years" experience, 82 (20.8%) administrators with "6-10 years", 37 (9.4%) administrators with "11 years and over". In terms of school location, there are 346 (87.8%) administrators working in the "provincial/district center" and 48 (12.2%) administrators working in the "town/village". In terms of hearing problem, there are 18 (4.6%) administrators with hearing problems and 376 (95.4%) administrators without hearing problems. In terms of the state of belief that noise can be prevented in school, 104 managers (26.4%) do not have faith that noise can be prevented in school, and 290 (73.6%) managers have faith that noise can be prevented in school.

2.2. Data Collection Tools

The researcher prepared a 16-item questionnaire form that was utilized in this study to collect data. A sample item of the questionnaire is, "Sounds caused by behaviors such as talking loudly, singing, screaming are disturbing". Studies on noise in the national and international literature as well as the "teacher survey", which is one of the data collection instruments used by Bulunuz (2020) as part of the TUBITAK (1001) project, entitled Noise pollution in schools: Causes, Effects and Control, have been used as part of the survey preparation phase.

The survey consisted of 3 parts A personal information form was used in the first part of the study to collect information about the demographic characteristics of school administrators taking part, as well as variables such as gender, education level, job status, executive seniority, school type, working in school, school location, hearing problems, and beliefs about preventing noise in schools. The second part of the survey contains six items that are designed to determine the opinions of school administrators about noise levels. A third part consists of ten items designed to gauge the opinions of school administrators about the effects of noise pollution in their schools, one of which has multiple answers. The weights and limits of the options used in the survey are given in Table 1 (Balci, as cited in 2002, Özdemir, 2010).

Table 1.
Weights and Limits of the Options Used in the Survey

Given weight	Limit	1-6 item options	7-15 item options
1	1.00 – 1.79	Very low	Disagree strongly
2	1.80 – 2.59	Low	Disagree
3	2.60 – 3.39	Middle	Agree moderately
4	3.40 – 4.19	High	Agree
5	4.20 – 5.00	Very high	Agree strongly

2.3. Data Analysis

The data was evaluated using statistical tools. Frequency and percentage values were used to analyze demographic variables in the first part of the survey. Frequency and percentage values of each survey item prepared to ascertain the school administrators' opinions about the noise level (item 1, 2, 3, 4, 5, 6), noise sources (item 7, 8, 9, 10, 11, 12), and negative effects of noise pollution on the school climate (item 13, 14, 15) were given and it was calculated the arithmetic mean, standard deviation and coefficient of variation. Only frequency and percentage values were calculated for item 16, which contains multiple response options for individual effects of noise.

3. FINDINGS

3.1. The Administrators' Opinions About the Noise Level in Their School

Table 2.

The Administrators' Opinions About the Noise Level in the School

Items	Options	f	%	n	\bar{x}	ss	v
1. The general noise level of the school	Very low	23	5,8	394	2,78	0,76	27,51
	Low	95	24,1				
	Middle	223	56,6				
	High	50	12,7				
	Very high	3	0,8				
2. The auditory environment (acoustics) of the school	Very low	14	3,6	394	2,88	0,68	23,71
	Low	73	18,5				
	Middle	256	65,0				
	High	48	12,2				
	Very high	3	,8				
3. The noise level in the classroom during the lesson	Very low	33	8,4	394	2,42	0,72	29,74
	Low	181	45,9				
	Middle	161	40,9				
	High	18	4,6				
	Very high	1	,3				
4. The noise level in the classroom during break times	Very low	12	3,0	394	3,16	0,90	28,50
	Low	69	17,5				
	Middle	185	47,0				
	High	100	25,4				
	Very high	28	7,1				
5. The noise level of the students at the entrance-exit time of the school	Very low	13	3,3	394	3,01	0,85	28,53
	Low	87	22,1				
	Middle	194	49,2				
	High	83	21,1				
	Very high	17	4,3				
6. The noise level of the place where your school is located	Very low	77	19,5	394	2,38	0,94	39,80
	Low	138	35,0				
	Middle	136	34,5				
	High	38	9,6				
	Very high	5	1,3				
Overall				394	2,77	0,55	20,18051

As can be seen from Table 2, regarding the general noise level of the school, the administrators mostly expressed their opinion at the "middle" level ($\bar{x}=2.78$). It seems that administrators' opinions about the general noise level of the school are not distributed uniformly ($v>25$). Regarding the auditory environment (acoustics) of the school, the administrators participating in the study mostly expressed an opinion on the auditory environment (acoustics) of their school at the "middle" ($\bar{x}=2.88$) level. It seems that administrators' opinions about the auditory environment of the school are distributed uniformly ($v<25$). Administrators generally expressed their opinion at the "low" ($\bar{x}=2.42$) level about the noise level that occurs in the classroom during the lesson. As can be seen, administrators' opinions about the noise level occurring in a classroom during the lesson are not distributed evenly ($v>25$). Administrators expressed their opinion mostly at the "middle" ($\bar{x}=3.16$) about the noise level that occurs inside the school during the break times. As observed, the administrators' opinions regarding the noise level occurring within the school during the break times are not distributed uniformly ($v>25$). The administrators expressed their opinion about the noise level during the entrance and exit hours of the school, mostly at the "middle" ($\bar{x}=3.01$) level. It is observed that the administrators' opinions about the noise level occurring during the entrance and exit hours of the school are not distributed uniformly ($v>25$). Administrators generally expressed their opinion about the noise level of the location of their schools at a

“low” ($x=2.38$) level. It is seen that the administrators’ opinions regarding the noise level of the school location are not distributed uniformly ($v>25$). The average of all items related to the noise level in the school included in the survey was calculated as $x=2.77$. In light of this, it was determined that school administrators generally described the noise level in the school as “medium”. There is an even distribution of opinions among administrators about the noise level in their schools ($v<25$).

3.2. The Administrators’ Opinions About Noise Sources in Their School

Table 3.

The Administrators’ Opinions About Noise Sources in Their School

Items	Options	f	%	n	\bar{x}	ss	v
7. Sounds caused by behaviors such as talking loudly, singing, screaming	Disagree strongly	11	2,8	394	3,83	0,96	25,28
	Disagree	30	7,6				
	Agree moderately	67	17,0				
	Agree	192	48,7				
8. Sounds caused by the heeled shoes and behaviors such as running around in the hallways, pulling items such as table chairs, slamming doors	Agree strongly	94	23,9	394	3,95	0,91	23,19
	Disagree strongly	6	1,5				
	Disagree	25	6,3				
	Agree moderately	64	16,2				
9. Sounds caused by lighting devices, bells and announcements	Agree	186	47,2	394	3,11	1,07	34,73
	Agree strongly	113	28,7				
	Disagree strongly	28	7,1				
	Disagree	89	22,6				
10. Sounds caused by road traffic from outside, people on the street and students playing loud games in the schoolyard	Agree moderately	127	32,2	394	3,30	1,06	32,17
	Agree	113	28,7				
	Agree strongly	37	9,4				
	Disagree strongly	22	5,6				
11. Sounds from construction activities in the surrounding area while at school	Disagree	69	17,5	394	3,80	1,10	29,06
	Agree moderately	118	29,9				
	Agree	140	35,5				
	Agree strongly	45	11,4				
12. Sounds originating from shopping places such as factories, workplaces, entertainment and bazaars located in the vicinity while at school	Disagree strongly	18	4,6	394	3,87	1,08	28,10
	Disagree	44	11,2				
	Agree moderately	47	11,9				
	Agree	175	44,4				
Overall	Agree strongly	110	27,9	394	3,64	0,76	20,96

As can be seen from Table 3, regarding the item related to sounds caused by behaviors such as talking loudly, singing, screaming, the administrators expressed their opinion at the “I agree” level ($x=3.83$). It is understood that administrators mostly agree that the sounds caused by behaviors such as talking loudly, singing, screaming are disturbing, but there are also a small number of administrators disagreeing with this item. ($v>25$). Regarding the item related to the sounds caused by heeled shoes and behaviors such as running around in the corridors and pulling items such as table chairs, slamming door, the administrators expressed their opinion at the “I agree” level ($\bar{x}=3,95$). It is seen that the administrators’ opinions about the fact that the sounds caused by heeled shoes and behaviors such as running around in the corridors and pulling items such as table chairs, slamming door are disturbing are distributed homogeneously ($v<25$). Regarding the item related to sounds caused by lighting devices, bells and announcements, the administrators expressed their opinion at the “agree moderately” level ($\bar{x}=3,11$). It is seen that the administrators’ opinions about the fact that the sounds caused by lighting devices, bells and announcements are disturbing are not distributed uniformly ($v>25$). Regarding the item related to sounds caused by road traffic from the outside, people on the street, and students playing loud games in the schoolyard, the administrators expressed their opinion at the “agree moderately” level ($\bar{x}=3,30$). It is seen that the administrators’ opinions about the fact that the sounds caused by road traffic from outside, people on the street and students playing loud games in the schoolyard are disturbing are not distributed homogeneously ($v>25$). Regarding the item related to sounds from construction activities in the surrounding area while at

school, the administrators expressed their opinion at the “I agree” level ($\bar{x}=3,80$). It is seen that the administrators’ opinions about the fact that the sounds caused by the surrounding construction activities are disturbing are not distributed homogeneously ($v>25$). Regarding the item related to sounds originating from shopping places such as factories, workplaces, entertainment and bazaars located in the vicinity while at school, the administrators expressed their opinion at the “I agree” level ($\bar{x}=3,87$). It is seen that the administrators’ opinions about the fact that sounds originating from shopping places such as factories, workplaces, entertainment and sundays that are located in the vicinity are disturbing are not distributed homogeneously ($v>25$). The average score of all items related to noise sources in the school included in the survey was calculated as $\bar{x}=3,64$. Accordingly, it was found that the administrators expressed their opinions at the “I agree” level regarding the statements given under this title. The administrators’ opinions are homogeneously distributed about the disruptive nature of the school’s noise sources, both inside and outside of school ($v<25$).

3.3. The Administrators’ Opinions About Negative Effects of Noise Pollution on the School Climate and Individuals

Table 4.

The Administrators’ Opinions About Negative Effects of Noise Pollution on the School Climate

Items	Options	f	%	n	\bar{x}	ss	v
13. Performance and motivation of teachers	Disagree strongly	5	1,3	394	4,02	0,868	21,61
	Disagree	18	4,6				
	Agree moderately	61	15,5				
	Agree	192	48,7				
	Agree strongly	118	29,9				
14. Performance and motivation of students	Disagree strongly	3	,8	394	4,04	0,858	21,26
	Disagree	21	5,3				
	Agree moderately	57	14,5				
	Agree	191	48,5				
	Agree strongly	122	31,0				
15. Communication between the teacher and the student	Disagree strongly	4	1,0	394	3,97	0,863	21,74
	Disagree	24	6,1				
	Agree moderately	57	14,5				
	Agree	205	52,0				
	Agree strongly	104	26,4				
Overall				394	4,00	0,79	19,84

As seen in Table 4, the administrators expressed their opinion at the “I agree” level ($\bar{x}=4,02$) regarding teachers’ performance and motivation. There is a homogeneous distribution of the administrators’ opinions regarding noise’s negative impact on teachers’ motivation and performance ($v<25$). The administrators expressed their opinion at the “I agree” level ($\bar{x}=4,04$) regarding students’ performance and motivation. There is a homogeneous distribution of the administrators’ opinions regarding noise’s negative impact on students’ motivation and performance ($v<25$). The administrators expressed their opinion at the “I agree” level ($\bar{x}=3,97$) regarding the communication between the teacher and the student. It is observed the administrators’ opinions regarding the fact that noise in the school negatively affects the communication between the teacher and the students are distributed homogeneously ($v<25$). The average of all the items related to the noise negative effects on the school climate in the survey was calculated as $\bar{x}=4,00$. Accordingly, it was found that the administrators expressed their opinions at the level of “I agree” with the statements given under this heading. It is seen that the administrators’ opinions regarding the noise negative effects on the school climate are distributed homogeneously ($v<25$).

Table 5.

The Administrators’ Opinions About Negative Effects of Noise Pollution on Individuals

Items	Options	f	%
16. The effects of noise on human health	Headache	253	20,0
	Reluctance	91	7,2
	Depression	61	4,8
	Boredom	102	8,0
	Tinnitus	92	7,3
	Unhappiness	201	15,9
	Fatigue	36	2,8
	Hearing Loss	63	5,0
	Nervous Exhaustion	258	20,3
	Distraction	108	8,5
	Other	3	0,2

As shown in Table 5, 253 (20%) headache, 91 (7,2%) reluctance, 61 (4,8%) depression, 102 (8%) boredom, 92 (7,3%) tinnitus, 201 (15,9%) unhappiness, 36 (2,8%) fatigue, 63 (5%) hearing loss, 258 (20,3%) nervous exhaustion, 108 (8,5%) distraction, 3 (0,2%) other options were marked when administrators participating in the study were asked about the noise effects on human health.

4. RESULTS, DISCUSSION AND RECOMMENDATIONS

According to the findings, the fact that administrators think that the noise level in their schools is moderate may be an indication that they do not perceive noise as a problem and that they got used to the noise pollution in their schools. This result shows that managers' awareness and sensitivity levels about noise pollution in school should be increased. Otherwise, this opinion of the administrators will make it difficult to take action to solve the noise problem in schools. In addition, this result does not coincide with research that has revealed in the literature that schools' noise levels exceed regulatory limits by wide margin because studies conducted in our country show that schools' noise levels exceed the upper limits specified in the noise protection regulation published by the Ministry of Environment and Urbanization in 2017 and the sound insulation regulation that became effective in 2018. Polat and Kırıkkaya (2004), in their study conducted in elementary and secondary schools, found that the noise level in the classroom will negatively affect the educational environment and is much higher than the acceptable noise level. Bayazit et al. (2011) measured the noise inside and outside in primary schools during the day, during class and during recesses. They found that the measurements produced results far greater than the maximum value possible. In addition, as shown by Abakay and Bulunuz (2018)'s research in primary, secondary, and high schools, the noise levels during classes and recess in all schools exceeds the limits set by the law. Similarly, in a study done in a primary school by Bulunuz and colleagues (2018), it was discovered that noise levels in the school exceeded the allowed level and teachers' opinions supported this conclusion. Engin, Özen and Bayoğlu (2009) stated that in their research, students rated the noise level of their schools as high.

The study's findings indicate that administrators usually see sounds caused by students' noisy behavior inside the school as a noise source from in-school noise sources. Ikenbergy (1974) also emphasized that there are two primary causes of noise pollution in school; the first reason showed the noisy behavior of students. This result indicates that the great majority of administrators are aware of student-caused noise at school. In addition, this result shows the importance of education that should be given to students at school for the harmful impacts of noise and indicates that students' awareness of noise at school should also be increased. The results of the study conducted with teachers in this field also show similarities with the findings obtained (Bulunuz, 2014; Bulunuz et al, 2017a; Yee Choi and McPherson, 2005; Grebennikov, 2006; Jaramillo, Ermann, and Miller, 2013; and Merkit and Bulunuz, 2019; Türnüklü and Galton, 2001). Bulunuz (2014), Bulunuz et al. (2017a) and Yee Choi and McPherson (2005) found in their research that teachers often see students as the source of noise in schools. In the research conducted by Jaramillo and others (2013), they concluded that teachers think that one of the sources of noise in school is students' shouting, and similarly in the research of Grebennikov (2006) and Türnüklü and Galton (2001), teachers consider students' noisy behavior, shouting, and unauthorized speech to be a source of noise. In addition, it is possible to conclude that sounds produced by devices (announcements, ringing tones) are not perceived by administrators as noise. This situation creates the opinion that administrators believe that sounds originating from devices are not noisy (announcements, ringing tones) and do not consider these sounds as a noise source in the school. These findings are in accordance with Bulunuz and colleagues' (2017a) research on teachers. Bulunuz et al. (2017 a) found that over half of the teachers claimed that they did not hear the sounds caused by lighting devices, bells, and announcements and did not feel uncomfortable.

It is seen that administrators consider sounds from non-school noise sources, usually factories or construction-related places and from shopping places such as workplaces, entertainment places and bazaars, as a source of noise and are uncomfortable with these sounds. Administrators perceive road traffic noise, people on the street, and students playing loud games in the schoolyard as less disturbing than other environmental sounds. It is related to urban traffic noise in residential areas and to the surrounding environment of the school. In their study with teachers, Merkit and Bulunuz (2019) found a similar result. In Merkit and Bulunuz's (2019) study, it was stated that teachers are uncomfortable with other environmental noises besides highway noise.

Identifying the sources of noise in schools is critical to addressing the problem. It can be concluded from these results that managers are generally aware of noise sources. In schools, administrators' views on noise sources are important for reducing and preventing noise pollution, because they are capable of contributing to an appropriate learning environment.

According to the study's findings, administrators are conscious of the effects of noise on the school climate. Researchers conducting research on teachers in this field also report similar findings (Bulunuz et al., 2017a; Bulunuz et al., 2018; Engin et al., 2009). In a research conducted by Bulunuz et al. (2017a), where the noise effects on teachers were examined, when a teacher talks about the effect of noise, he says, "If this sound is too much, you are surprised or forget the topic you are talking about." his use of the phrase has clearly stated the effect of noise on the teacher's performance. Similarly, Bulunuz et al. (2018) found that noise caused teachers' motivation and productivity to decrease in their research. Engin et al. (2009) stated that noise disrupts the school climate, distracts teachers and students, causes them to get tired quickly, and causes behaviors that make learning difficult to occur.

School administrators have stated that they are most negatively affected by noise in school in the form of nervous exhaustion in relation to the individual effects of noise. This is followed by negative effects in the form of headache, unhappiness, distraction, boredom, tinnitus, reluctance, hearing loss, weakness, and other, respectively. This implies that managers individually experience the negative effects of noise pollution in a physical, physiological, and psychological sense. The findings of the research conducted with teachers in this field are also similar (Engin et al., 2009; Bulunuz, 2014; Sezgin and Mutlu, 2017; Çetinkaya, Bulduk, İşçi and Demir, 2017; Bulunuz et al., 2017a; Bulunuz et al., 2018; Cebenoyan, 2018).

In order for an effective educational process to take place at school, a healthy school climate is required. According to these results, it seems very difficult to obtain the desired efficiency from teachers and students engaged in educational activities. Reduced and prevent noise levels in schools can be healthy for teachers and students who spend most of their time in the classroom.

This study is limited to 394 school administrators employed by the Ministry of National Education in official elementary, middle, and high schools in Sakarya in the spring semester of the 2020-2021 academic year and their responses to survey questions.

Research and Publication Ethics Statement

Hereby, we as the authors consciously assure that for the manuscript "Assessment of School Administrators' Views Regarding the Level, Sources and Effects of Noise in School" the following is fulfilled:

- This material is the authors' own original work, which has not been previously published elsewhere.
- The paper reflects the authors' own research and analysis in a truthful and complete manner.
- The results are appropriately placed in the context of prior and existing research.
- All sources used are properly disclosed.

Contribution Rates of Authors to the Article

The authors provide equal contribution to this work.

Statement of Interest

There is no conflict of interest.

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