

Difference in Voice Problems and Noise Reports Between Teachers of Public and Private Schools in Upper Egypt

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Summary: Objective. This study aimed to assess teachers' voice symptoms and noise in schools in Upper Egypt and to study possible differences between teachers in public and private schools.

Study Design. A cross-sectional analysis via questionnaire was carried out.

Methods. Four schools were chosen randomly to represent primary and preparatory schools as well as public and private ones. In these schools, a total of 140 teachers participated in the study. They answered a questionnaire on vocal and throat symptoms and their effects on working and social activities, as well as levels and effects of experienced noise.

Results. Of all teachers, 47.9% reported moderate or severe dysphonia within the last 6 months, and 21.4% reported daily dysphonia. All teachers reported frequent feelings of being in noise, with 82.2% feeling it sometimes or always during the working day, resulting in a need to raise their voice. Teachers in public schools experienced more noise from nearby classes.

Conclusion. The working conditions and vocal health of teachers in Upper Egypt, especially in public schools, are alarming.

Key Words: Egypt—Teachers—Voice—Public schools—Private schools.

INTRODUCTION

The voice is the main tool in classroom teaching. Teachers place heavy demands on their voice, often instructing for many hours in acoustically challenging environments without much time for the voice to rest.¹ Voice disorders are more prevalent in teachers (15%–86%) than among the general population (6%–15%).² Vocal problems can have a significant impact on the work capacity of school teachers, leading to important financial and vocational costs to the community, teachers, and their families.³ Risk factors for voice problems among teachers include female gender,^{1,4,5} more years of teaching,^{1,6} and poor classroom environment.^{7,8} Other risk factors include smoking⁹ and upper airway problems.⁸

In Egypt, the law requires that all children should be enrolled in basic education from the age of 6 until the age of 14. The 9 years of so-called basic education are divided into 3 years in preparatory school and then 6 years in primary school.¹⁰

School teachers in Egypt have hardly ever been examined for voice and throat symptoms. Average salaries of teachers in schools in Egypt are not certain; however, current news reports point to it being between EUR 100 and 250 per month.¹¹ Salaries in schools run by the government fall into the low end of the range, whereas teachers in private schools are in the upper range. Because

of low salaries, teachers often work after hours, giving private tuition or doing other jobs.

The factors discussed above predict that occupational voice disorders may be more frequent among teachers in public than in private schools. Egypt's unique educational system, which reflects the social classes of Egyptian society, motivated us to study its effects on the voices of teachers in Egypt's public and private schools.

AIMS

The study aimed to assess voice symptoms among teachers in Upper Egypt with a special emphasis on the differences between teachers working in public vs private schools, as well as noise perception in teacher's working environment.

SUBJECTS AND METHODS

In the Governorate of El-Minia in Upper Egypt, primary and preparatory schools were divided into four blocks. Each was either preparatory or primary and public or private. Schools were chosen randomly from each block. From these schools, 200 teachers were invited to participate in the study, with 140 agreeing to participate (nearly equal among the four schools and primary and public; females = 85). Of the 69 participants in primary schools, 36 were in public and 33 in private schools, and for preparatory schools (n = 71), the figures were 34 teachers and 37, respectively. Answering questionnaires was carried out in the workplaces of participating teachers, with the first author available to help in case something needed clarification.

The teachers were asked to fill a questionnaire about their subjective assessment of their voice, noise, and background information:

1. Age, years of experience, type of school, hours spent using her/his voice in teaching and other administrative or social

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encounters, and voice-related jobs or hobbies. Voice-related medical history and frequency of upper respiratory infections were also asked.

2. Voice and throat symptoms during the last 6 months preceding the study, frequency and severity of different symptoms, and effects of these on work and social activities. Severity was assessed by asking the teacher to choose one of the four grades of none, mild, moderate, or severe.
3. Effects, levels, and types of noise experienced during the working day.

The study received ethical committee approval from Minia University. It also received the approval of the undergraduate educational authorities in Minia, Egypt.

STATISTICS

Descriptive statistics were used for the percentages and frequencies of symptoms of background information, voice symptoms, and noise reports among the teachers. Differences in the distribution of these findings between teachers working in public and private schools were examined using the Mann-Whitney *U* test. Significance level was set at $P < 0.05$ in all statistical analyses. The statistical analyses were carried out with *SPSS 22 software* (IBM SPSS Statistics v. 22 for Windows, Armonk, NY).

RESULTS

Background information and voice use

Mean age of all teachers was 35.8 years (range 21–56 years). There was a significant difference ($P < 0.00$) between the mean age of teachers in public schools in comparison to private ones, at 40.6 and 30.9 years, respectively. When asked about different diseases with possible effects on the voice in the 6 months preceding this study, 10 reported having asthma, 29 gastric reflux, 39 chronic sinusitis, and 27 hearing impairment. Only eight teachers were smokers.

Average years of experience teaching was also significantly different ($P < 0.001$) between public school (17.9 years) and private school (7.4 years) teachers, with a total average of 12.3 years for the two groups combined. Also, the average class size was significantly higher in public schools (39 children; $P < 0.001$) than in private schools (33 children).

On voice use, 61% of teachers reported teaching without intervals, with no significant difference found between the public and private schoolteachers. On duration of teaching, teachers taught for 4 hours in public schools and 4.9 hours per day in private school (nonsignificant difference). Public school teachers talked with their colleagues on average for 1.9 hours per day in comparison to 1.8 hours in private schools.

Of the 140 teachers, only 18 (12.9%) reported giving private tuition to children after the end of the official school day. Nine (6.4%) teachers reported having a second evening job other than teaching and all reported having to deal with customers (eg retail shops, sports coaching, and call centers).

None of the teachers reported nonreligious singing as a hobby, although seven (5%) sang in church choirs. Of the teachers, 26 (18.6%) recited the Quran regularly at home or taught it to others. Five (3.6%) gave lectures at mosques. Among public school teachers, 35 (50%) had no other voice-related second job or hobby; the same was reported by 41 teachers (58.6%) in private schools. There were no significant differences by school type for voice-related out-of-hours work and hobbies.

Voice and throat symptoms and their effects on work and social activities

Almost half of teachers (47.9%) reported moderate and severe dysphonia daily or weekly within the last 6 months. Reports of throat pain, dryness, or clearing, as well as failing voice by the end of the work day were also common (see [Table 1](#)).

No significant difference in severity and frequency of voice and throat symptoms was found between public and private school teachers, except for the symptom “voice failing by the end of working day,” which teachers in public schools reported more often ($P = 0.03$; see [Table 2](#)).

We also examined the effects of voice and throat symptoms on out-of-hours work and social activities ([Table 3](#)). Needing extra effort to complete speech was reported by almost a fifth of teachers (17.9%). In addition, 10.7% of teachers experienced increased absence from school (1–2 days in the last 6 months) or a decrease in income because of voice symptoms. These two symptoms were more common in public than private school teachers ([Table 4](#)).

When asked if their voice is heard clearly by others on account of possible voice problems, 104 teachers reported their voice being heard clearly, 34 reported their voice being somewhat heard, and 2 reported that their voice was not heard clearly.

Effects, levels, and types of noise experienced during the working day

Teachers reported always (34; 24.2%), sometimes (81; 57.9%), rarely (18; 12.9%), and never (7; 5%) “feeling of being in noise,” whereas the respective figures for having to raise their voice because of noise were 72 (51.4%), 46 (32.9%), 16 (11.4%), and 6 (4.3%). None of the teachers used amplifiers during work. A significant but low correlation was found between presence of hearing impairment and increase in the need to raise voice because of noise ($r = 0.23$, $P = 0.006$). [Figure 1](#) shows the distribution of reports of “feeling of being in noise” among public and private school teachers.

[Figure 2](#) shows the percentage of teacher reports on different sources of noise. Noise coming from nearby classes was the only type that showed a statistically significant difference between teachers in public and private schools ($P = 0.001$).

Doors and windows in classrooms were reported to be always (32; 22.9%), sometimes (71; 50.7%), rarely (19; 13.6%), and never (18; 12.9%) closed. Two (0.014%) public school teachers reported a broken window in their classroom. In addition, over a third of teachers (56; 40%) reported working in classrooms where the door was broken, with a significant difference ($P = 0.001$) between public (38; 27.1%) and private (18; 12.9%) schools. A significantly positive but low correlation ($r = 0.21$,

TABLE 1.
Distribution of Severity (A) and Frequency (B) of Different Voice and Throat Symptoms Among Studied Teachers, N = 140

A. Severity of Reported Symptom

Parameter	Severity of Reported Symptom			
	None	Mild	Moderate	Severe
Dysphonia	26 (18.6%)	47 (33.6%)	54 (38.6%)	13 (9.3%)
Throat pain	45 (32.1%)	37 (26.4%)	43 (30.7%)	15 (10.7%)
Throat clearing	27 (19.3%)	46 (32.9%)	49 (35%)	18 (12.9%)
Throat dryness	24 (17.1%)	50 (35.7%)	49 (35%)	17 (12.1%)
Voice not coping by the end of working day	44 (31.4%)	43 (30.7%)	35 (25%)	18 (12.9%)

B. Frequency of Reported Symptom

Parameter	Frequency of Reported Symptom			
	Less Recurrence	Monthly Recurrence	Weekly Recurrence	Daily Recurrence
Dysphonia	54 (38.6%)	28 (20%)	28 (20%)	30 (21.4%)
Throat pain	Some left this unassessed so we excluded its results.			
Throat clearing	42 (30%)	19 (13.6%)	40 (28.6%)	39 (27.8%)
Throat dryness	39 (27.8%)	22 (15.7%)	37 (26.4%)	42 (30%)
Voice not coping by the end of working day	Some left this unassessed so we excluded its results.			

$P = 0.01$) was found between noise coming from nearby classes and a broken door in the classroom.

Ad hoc analysis on difference between primary and preparatory schools' teachers was carried out as well. Teachers working in primary schools had a mean age of 34 years whereas in preparatory schools the mean age was 37.5 years ($P = 0.32$). Average years of teaching experience was also significantly different ($P = 0.046$) between primary school (11.3 years) and preparatory school (14 years) teachers. Reports of dysphonia severity were more common among primary school teachers, with 58% of teachers reporting moderate or severe dysphonia in comparison to 48% among teachers in preparatory schools ($P = 0.017$).

Reports of extra effort to complete speech were also more common among teachers in primary school than those in preparatory schools. Among teachers of primary schools, 32.6% reported no need for extra effort in comparison to 54.9% among teachers of preparatory schools.

DISCUSSION

Teachers in public schools experienced more voice and throat symptoms and more often had a feeling of being in noise, with more effects on their working and social conditions than teachers in private schools.

TABLE 2.
Distribution of Severity of Symptom "Voice Failing by the End of Work Day" Among Teachers of Public and Private Schools

Voice Not Coping by the End of Working Day	None	Mild	Moderate	Severe
Public schools*	17 (24.3%)	22 (31.4%)	18 (25.7%)	13 (18.6%)
Private schools	27 (38.6%)	21 (30.0%)	17 (24.3%)	5 (7.1%)

* $P = 0.03$.

TABLE 3.
Distribution of Frequency Reports on the Effects of Voice and Throat Symptoms on Work and Social Activities

Parameter	No	Sometimes	Very Often
Voice problems restrict personal and social life	103 (73.6%)	30 (21.4%)	7 (5%)
Extra effort to complete speech	64 (45.7%)	51 (36.4%)	25 (17.9%)
Feeling annoyed from questions about own voice sounding abnormal	108 (77.1%)	28 (20%)	4 (2.9%)
Parameter	Never	1–2 Days	>2 Days
Voice problems lead to increased absence from school and decrease in income within the last 6 months	122 (87.2%)	15 (10.7%)	3 (2.1%)

TABLE 4.
Frequency of Two Parameters of Effects of Voice and Throat Symptoms on Work and Social Activities

Parameter	School Type	Never	1–2 Days	>2 Days
Voice problems lead to increased absence from school and decrease in income	Public	57 (81.4%)	11 (15.7%)	2 (2.9%)
	Private*	65 (92.9%)	4 (5.7%)	1 (1.4%)
Parameter	School Type	No	Sometimes	Very Often
Extra effort to complete speech	Public	28 (40%)	24 (34.3%)	18 (25.7%)
	Private**	36 (51.4%)	27 (38.6%)	7 (10%)

* $P = 0.046$; ** $P = 0.047$.

Private schools in Egypt are usually favored by parents on the basis of fewer children in the classrooms. However, an average class size of 39 children in public schools and 33 in private ones is still alarmingly high, even for private schools. A study of 550 primary school teachers in Dublin found that 49.67% of teachers reported voice problems when teaching a class size >30 pupils in comparison to 30.26% when the class size was <30 pupils.¹² Teachers of large classes have shown three times the occurrence of voice disorders in comparison to teachers of smaller classes.¹³

Another interesting finding is that none of the teachers reported nonreligious singing among their hobbies. This may be attributed to the cultural background in Upper Egypt which favors predominantly religious singing and reciting of holy books.

The finding that 61% of all teachers reported teaching without intervals, which is quite high in terms of the teachers' need of voice rest, is in line with previous findings of Sala et al on the lack of vocal rest among primary school teachers.¹⁴

Teachers' reports on voice and throat symptoms and their effects on working and social activities were also striking. Only 18.6% of teachers did not have dysphonia during the last 6 months. Nearly half of teachers rated their dysphonia as moderate or severe, with 21.4% reporting dysphonia on a daily basis. High percentages of voice disorders are known to happen among school teachers.¹⁵ The overall lifetime occurrence of voice disorders among school teachers was reported to be 68.7% among 425 teachers studied in Poland.¹⁶ A study in Ireland reported that 80% of 243 teachers¹⁷ had either a current or intermittent voice problem. A study in northern Egypt found that the prevalence of subjectively reported dysphonia was 23.2% during the time of the study.¹⁸

In our study, 70% of teachers reported their voice failing by the end of the day, being more severe among public school teachers. It is possible that the more crowded classrooms in public schools, which impose more vocal loading on teachers, is one of the reasons behind this. Nevertheless, teachers in public schools

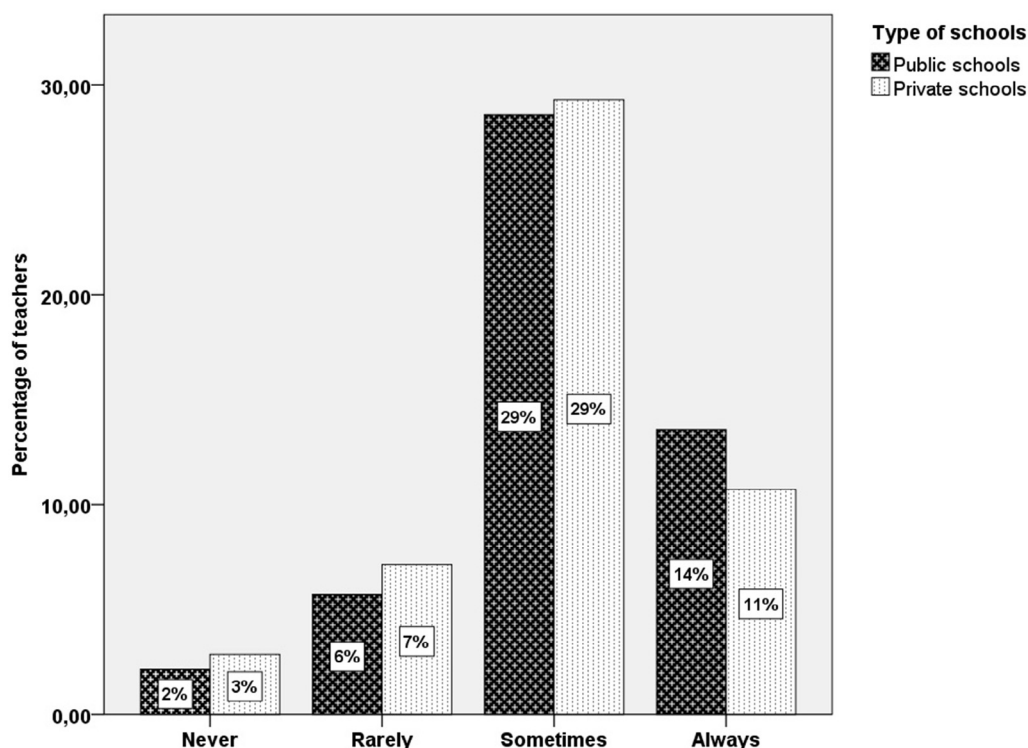


FIGURE 1. Frequency distribution of reports of "feeling of being in noise" among public and private school teachers.

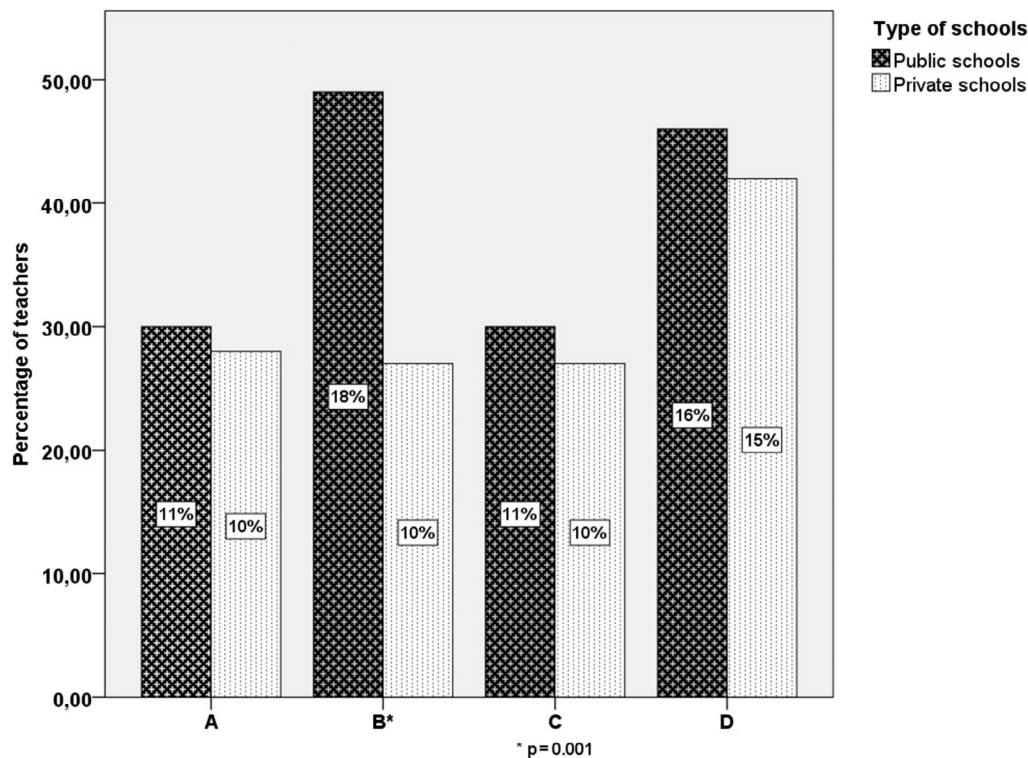


FIGURE 2. Percentage of teachers ($n = 140$) reporting different sources of noise. **A.** Noise from close railway or main road. **B.** Noise coming from other nearby classes. **C.** Noise from the yard of the school. **D.** Children's activities and talks in the class.

were on average 10 years older than teachers in private schools. It is also possible that this difference in age is also one of the factors leading to the more often reported symptom of "voice failing by the end of working day" among teachers of public schools.

Examining the effects of voice and throat symptoms on work and social activities revealed a number of alarming findings. Of the teachers, 10.7% sometimes experienced voice problems, resulting to 1–2 days of absence from school in the last 6 months and a decrease in their income, which was twice as common in public schools. In a study by et al of elementary and secondary school teachers residing in Iowa and Utah, 7.2% of teachers (1192 participants) were absent from work for 1 or more days because of their voice, and 2% reported a voice-related absence of 4 or more days during the year preceding the study.¹⁹ In a study in the northern Flemish part of Belgium, almost a fifth (19.2%) of teachers ($n = 994$) reported being absent for at least 1 day because of voice-related dysfunction.²⁰

The findings that 36 (25.7%) teachers reported that their voice is somewhat or not heard clearly is alarming because of the negative effect impaired vocal quality has on children's processing of language that potentially reduces their learning performance.^{21,22} It is possible that both prevalence of dysphonia and noise contribute to this alarming finding.

The types and effects of noise reported in this study reflect the current financial situation in Egypt. More frequent reports of a feeling of being in noise were found among public school teachers. More than half of the teachers reporting their classrooms had a broken door were from public schools. A study by

Kankare et al of kindergarten teachers in Finland found that teachers considered noise in their working environment to be the most detrimental factor for the voice, especially the background noise produced by children.²³ Noise has been considered most harmful to the voice in earlier studies.^{24–26} The financial situation may have also resulted in none of the teachers using amplifiers while teaching. The average salary ranges from EUR 100 to 250 per month,¹¹ and the government does not compensate teachers for purchasing amplifiers.

The *ad hoc* analysis showed that some differences exist as well between teachers of primary and preparatory schools. Such differences point to another dimension of this study that will be explored in a following article.

CONCLUSIONS

Voice symptoms and noise conditions were studied in public and private schools in Upper Egypt. The study aimed at improving our understanding of the severity of teachers' voice problems and background noise in classrooms in Upper Egypt and especially the difference between public and private schools. The results of the study show the potential effects of culture and economic situation on these difficulties. The study showed that teachers in public schools have more pupils per classroom and are more susceptible to the voice failing by the end of the working day. In addition, almost half of the teachers reported moderate or severe dysphonia in the 6 months preceding the study. Of all teachers, 82.2% reported always or sometimes feeling noise during teaching. Teachers in public schools experienced more noise disturbance from nearby classes.

This study clearly shows that the working conditions of teachers in Upper Egypt and especially in public schools need improvement. It would be beneficial to extend the study to include other regions of Egypt.

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