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ORIGINAL ARTICLE

Hygiene Practice Among the Primary School Children During COVID-19 Pandemic in Türkiye: A Descriptive Analysis on the Significance of Social Awareness

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Abstract

Introduction: COVID-19 has emerged as a globally serious concern in recent times. The pandemic has raised several questions about our hygiene practices, social behaviors, and attention to health conditions. Understanding and following certain behavioral and social changes is cumbersome for the children. Practicing proper hand hygiene is of immense importance for the children for their safety and to prevent the disease spread. The present study was conducted to understand the influence of several social factors and instructions to maintain and practice better hand hygiene for school children.

Methods: The present cross-sectional survey was conducted between Nov 2019 and Mar 2020 among 3462 students. The survey was conducted using a suitable questionnaire that contained questions on the participants' awareness of the pathogens and diseases, the importance of hygiene, and the response of the students to the instruction provided by their parents or teachers related to hand washing and hygiene maintenance. All categorical responses were scaled using the Likert scale in the range of 1–5. Analysis of the data was done using standard descriptive and inferential statistical measures.

Results: The considered students were between the age of 7 and 11. The selected participants were from the 2nd, 3rd, and 4th grades. Out of the total participants, 35.6% were the single child of their parent, whereas 64.44% were having siblings. When the parents of the participants were classified into higher education, the rate of fathers was 7.07% and the rate of mothers was 12.94%, which was statistically significant.

Discussion and Conclusion: The outcomes, follow-ups, and observations in this study suggested that the students often follow instructions that are attractively presented. During following instructions related to hand wash, they often miss the minute details.

Keywords: COVID-19 pandemic; hygiene practices; hygiene; primary school children; social awareness.

Health management should be the prime importance for human life. Throughout human history and civilization, the personal and community health management system has been considered as one of the most important aspects. Health assessment of an individual and a family including risk factor estimations remained a priority for primary health caregiving systems[1]. However, it is well-mentioned by Anne Wilson Schaef that "Good health is not something we can buy. However, it can be an extremely valuable savings account." Hence, personal attention to health and hygiene management is crucial for a healthy and fruitful life. Proper dissemination of health-related information by the authorities and public awareness on various health aspects is essential[2,3]. The long history of pan-

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demics, epidemics, and communicable diseases increased human awareness about proper hygiene maintenance and treatments[4,5]. The World Health Organization (WHO) has defined personal hygiene as a scientifically proven sequence of practices that preserve general health and prevent disease spreading[6]. Such hygiene guidelines are extended to specific considerations such as hand hygiene, water, sanitation and hygiene (WHO recommendations accessed on 08.12.20), hygiene for infection prevention, and respiratory hygiene during an epidemic of respiratory diseases[7-10]. Often, it is noticed that we compromise one or the other hygiene routine due to other priorities in life[11].

Infection disease pandemics and epidemics with higher death tolls, disability-adjusted life years, and reduced quality-adjusted life years reminds us the importance of health and hygiene. Major pandemics of communicable diseases, especially respiratory diseases such as influenza, MERS, SARS, and the ongoing COVID-19[12-16]. In the wake of recent pandemics, the importance of personal hygiene, social behavior, and appropriate distancing is proved to play a crucial role in controlling disease spread[17]. Hence, it is essential to practice essential hygiene for better health and disease prevention.

Children are the most vulnerable community member in any pandemic due to their lack of understanding of the severity of the situation and associated consequences. Several studies were conducted recently on the COVID-19 disease spread and their relation with children in various countries[18,19]. Although COVID-19 is mild in most of the infected children, the infection can turn the children into a potential disease carrier[20]. Following the WHO and Centers for Disease Control and Prevention (CDC) guidelines on wearing masks, hand washing in a scientific way may impact disease control immensely at a community level[21]. Such practices are recommended based on various factors such as the R0 estimation, community level, and professional interaction of the population[22,23].

Therefore, the role of parents, teachers, and associated elders is inevitable in convincing and preparing the children to seriously accept and practice the altered social rules, regulations, and responsibilities[24,25].

For a specific instance, the importance of simple hand washing practice with soap and water should be explained scientifically to the children for their better understanding and the far-reaching impact. The CDC and other major medical authorities recommend soaking the hands in clean soap water and rubbing for a minimum of 20 s for better results and disease prevention[26,27]. However, the response from the community may vary depending on the socioeconomic condition and awareness about the pandemic and other factors.

Therefore, the present descriptive study was conducted to understand the hygiene associated knowledge and practice among primary school children under the ongoing health education efforts.

Materials and Methods

The overall dataset contains 21 variables that include demographics, and social parameters, parameters derived from the responses to the questions. The common demographic parameters included age, gender, and the class of the student. Other social factors and information collected through the survey questions were whether the participant is the only child, parent's education level, awareness of germs and virus, information on the effect of washing hands and feet, information and awareness on COVID-19, and information on COVID-19 prevention through hand wash. Other similar information such as habits of hand washing before and after eating, washing home occasionally for maintaining the cleanliness, habits, and advice of family members before and after eating. Other relevant data, whether parents follow proper hygiene through hand wash regularly and advised the child to do so, whether his/her teacher follows handwashing habit before and after eating and advised so to the student, and whether the friends of the study participant follow such hygiene rules were also documented.

Study Site and Duration

The present study was conducted in Beylikdüzü/İstanbul. The regions were chosen due to their diverse socioeconomical background that included poor, middle, and upper-class societal conditions, respectively. The study was conducted between November 1, 2019, and March 1, 2020.

Ethical Consideration

The study was conducted following the proper ethical norms. The permission was obtained from the Social Sciences Ethics Committees before the data collection (Reference No: 29072019/14). The regional directorates of the schools were informed with a permission letter obtained from the District Directorate. Informed consent was obtained from the parents of the selected school children, and the objectives of the study were explained to them in detail. Verbal consent was also obtained from the school children and they were assured of confidentiality. All confidentiality norms are followed and no information on the

identity of the individual children was revealed to anyone.

Study Design

The present study was conducted with the help of an intense survey done from the responses received from the meticulously designed questionnaires. It was a cross-sectional study where the 1 time answer through a traditional paper-based method was collected from the primary students. The students of the primary classes of second to fourth grades were considered. A multi-stage random cluster sampling method was applied to select the research sample. While mentioning the hand wash related to the maintenance of hygiene, we considered handwashing with simple soap water for 20 s as recommended by the global health authorities, no specific application of sanitizers or antiseptic component was considered.

Initially, we randomly selected six districts and six schools. We invited all the students from the second to fourth grades to participate in the study to assure the students' literacy level and adequate language comprehension ability to understand and answer the questionnaire. The study questionnaire was designed based on a review of the literature and expert consultation. The questionnaire included knowledge about preventing parasites, microbe, and viruses through hand washing. The structured questionnaire was internally consistent (Cronbach's alpha=0.95), and the construct validity was demonstrated by the accumulated variance contribution rate of 65.2%. The questionnaires were completed in the classrooms, allowing enough privacy for each student. Researchers were present in each class to answer the student's queries.

Questionnaire

A structured questionnaire with various components was designed to evaluate the understanding of the students.

Assessment of the Knowledge on Handwashing

As presented in Table 1, measurement of the knowledge of handwashing was done through five items having different questions. For instance, the question, "can people be infected with viruses if they don't wash their hands before eating or after using the toilet?" was included. A five-point Likert scale ranging from 1 (totally impossible) to 5 (totally possible) was utilized to measure participants' responses to such knowledge-based questions.

Evaluation of Attitudes

Attitude toward handwashing was measured by three questions (Table 1). For instance, the question was asked on the agreement of the person on washing hand properly before and after eating and using the toilet. A 5-point Likert scale ranging from 1 (totally disagree) to 5 (totally agree) was utilized to measure these items. The higher the score, the more positive the attitude was toward conscious handwashing information.

Assessment of Subjective Norms

The subjective norms were measured by the degree to

Table 1. Descriptive statistics for the variables utilized in the questionnaire

Latent Variables	Participant details (n=3462)	Percentage (%)
Knowledge		
1-Have you heard about microbes and parasites (Yes)	3129	(90.4)
2-Do you heard about viruses (Yes)	2991	(86.4)
3-Do you know Microbes, parasites, viruses can be prevented (yes)	3132	(90.5)
4-Do you know about COVID-19 in China(yes)	471	(13.6)
	Mean±SD according to Likert scale (1–5)	
5-Do you know that you can prevent viruses, parasites, microbes by frequent hand washing (1–5)	3.2 (1.31)	
Attitude		
1-Washing hands before eating and after toilet (1–5)	3.2 (1.3)	
2-Washing hands after touching animals and soil (1–5)	2.9 (1.2)	
3-Washing hands for preventing microbes, parasites, and viruses (1–5)	2.3 (1.2)	
Subjective norm		
1-Following family's suggestion to wash hands before meal and after toilet (0–5)	2.5 (1.5)	
2-Following family's suggestion to wash hands after touching animals and soil (1–5)	2.0 (1.4)	
3-Following teachers' suggestion to wash hands before meal and after toilet (1–5)	2.5 (1.3)	
4-Following teachers' suggestion to wash hands after touching animals and soil (1–5)	2.5 (1.4)	

which individuals were likely to comply with the advice received from two major frequently believed influencing individuals, family, and teacher. Subjective norms were measured using four questions, for example, the question was included on the possible advice provided by the family member on washing hands before and after eating and after using the toilet. Questions were also asked on the likeliness of the student's agreement on such advice. The first question on normative belief was measured by 0 (never told) and 1 (told). The other items were measured by a 5-point Likert scale ranging from 1 (totally impossible) to 5 (totally possible). The higher the total score, the more positive the subjective norm one perceived.

Study Conduct and Completion

The distributed 3713 questionnaires were collected by hand after the completion of the survey. A self-administered paper-based survey was conducted. The completion rate of the survey questionnaire was 93.25% (n=3713), and the estimated average time to complete the survey questions was ±15 min. Analysis of the incomplete responses was done and it was found that 6.7% (n=250) of students did not complete the survey within the stipulated time. It was found that a significant number of participant children (185 children, 5%) were migrants from Syria and they were still learning Turkish. On the other hand, the remaining 65 children (1.75%) were psychologically restless, and attention deficit in nature.

Data Analysis

All collected responses were organized and tabulated in a spreadsheet that resulted in 21 variables and total responses derived dataset of 3462 rows. A thorough descriptive and inferential statistical analysis was conducted for the dataset to understand and evaluate the response characteristics using statistical means. Reliability and confirmatory factor analysis of the scale were assessed whether observed variables were adequate indicators of latent variables. All the numerical data are presented with mean±standard deviation, and the categorical data are presented through percentages.

The outcomes are, further, evaluated for statistical significance through inferential and hypothesis testing. The Chi-square test was used for the inference on the relation of the categorical dataset. A significance level of $p<0.05$. Yates correction was used for Pearson's Chi-Square test conducted. All analyses were done using the SPSS version 25.0 (IBM Corporation, Armonk, NY, USA), and R version 3.6.1. All graphical presentations are developed using R version 3.6.1.

Results

Demographical Analysis

Table 2 presents the demographic characteristics of 3462 students. The average age was 8.8 years (±1.1) (Fig. 1). Analysis of the gender of the survey participants suggested that 52% of the respondents were female (Figs. 1 and 2). Out of the participant students, 25.6 % were in class II, 27.9% were in grade III, and 46.5% were in grade IV (Fig. 3).

The minimum age of the participant was 7 years and the maximum age was 11 years (Fig. 1). The age distribution of the participants related to the gender of the participants is presented in Figure 1c and d. The analysis of the participants' ages between 7 and 11 suggested that 297 (8.57%), 1403 (40.52%), 725 (20.94%), 720 (20.79%), and 317 (9.15%) study participants were belonging to the age categories of 7, 8, 9, 10, and 11, respectively (Fig. 1a and b). The distribution of the participants' gender according to the mentioned age group is presented in Figure 1d.

Figure 2 presents the gender-specific division of the study participants in numbers (Fig. 2a), and an overall percentage distribution (Fig. 2b). As we considered students from 2nd, 3rd, and 4th grades, the class-wise distribution observed

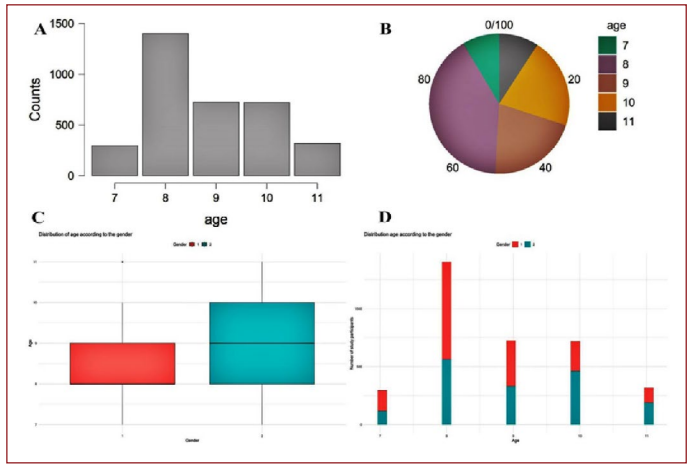

Figure 1. Distribution of the age of the study participants.

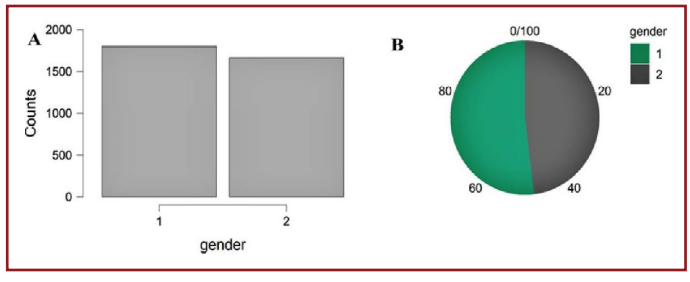

Figure 2. Distribution of the gender of the study participants.

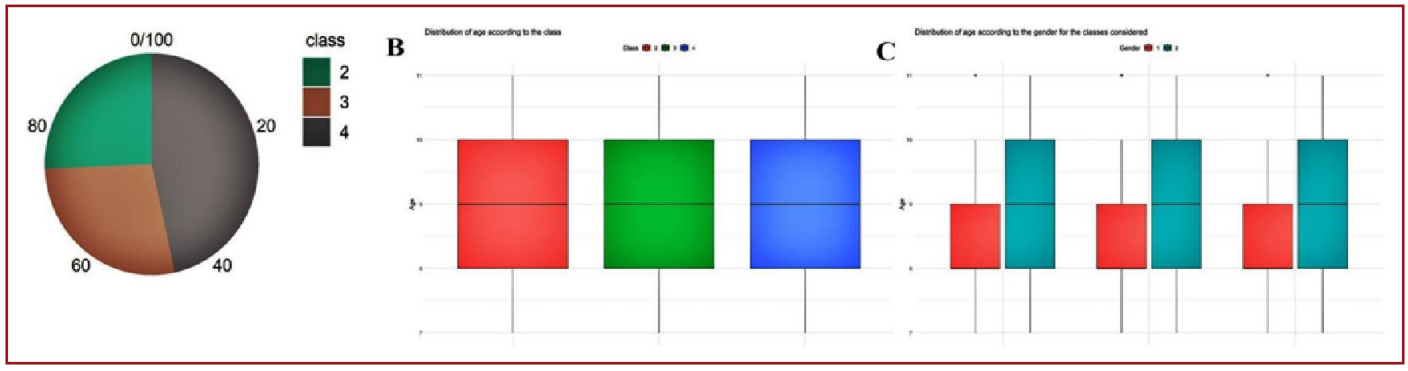

Figure 3. Categorization of different classes (2, 3, and 4) for the study population, age, and gender of the participants. **(a)** Percentage distribution of the participants according to the class. **(b)** Boxplot representation of class categories (2, 3, and 4) according to age. **(c)** Boxplot representation of class categories (2, 3, and 4) according to the age and gender of the study participants.

was 886 (25.59%), 965 (27.87%), and 1611 (46.53%), respectively. The class-specific distribution of the students is shown in Figure 3.

Analysis of the Social Factors

Out of the total participants, 35.6% (n=1231) were the single child of their parent, whereas 64.44% (n=2231) were having siblings. Education plays a pivotal role in our understanding and behavior, and parents' education level occasionally influences the children[28,29]. Therefore, the outcomes of the education level of the parents of the participants are presented in detail according to the academic class, as shown in Figure 4. It was observed that only 12.9% (n=444) (Table 2) of the mothers were having MBA or Ph.D. level education, whereas for the fathers, it was slightly higher (14.38%, 498) (Table 2, Fig. 4a and b). The difference in the higher education was observed between the fathers (7.07%, n=245) and the mothers (12.94%, n=448) of the participant children. This education level difference was statistically significant (p<0.001, Confidence Interval 95%).

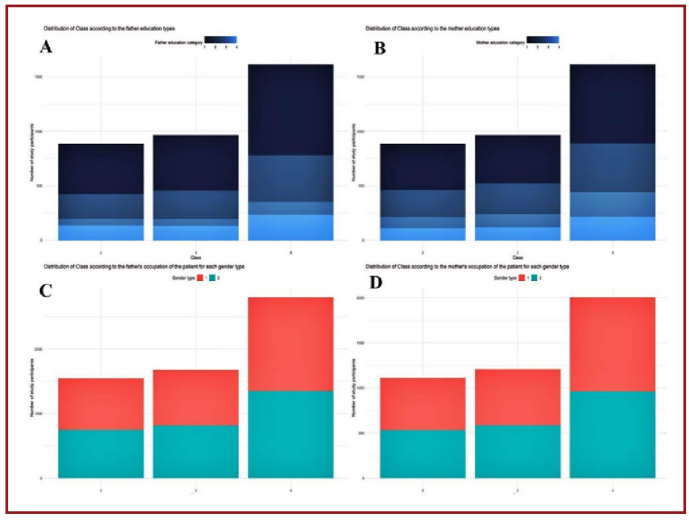

Figure 4. Demographic distribution of parents' education and occupation as per the class distribution of the study population. **(a)** Distribution of the study population classes according to the father's education type. **(b)** Distribution of the study population classes according to the mother's education type. **(c)** Distribution of the study participants based on their class, gender, and the patient's father's occupation. **(d)** Distribution of the study participants based on their class, gender, and the patient's mother's occupation.

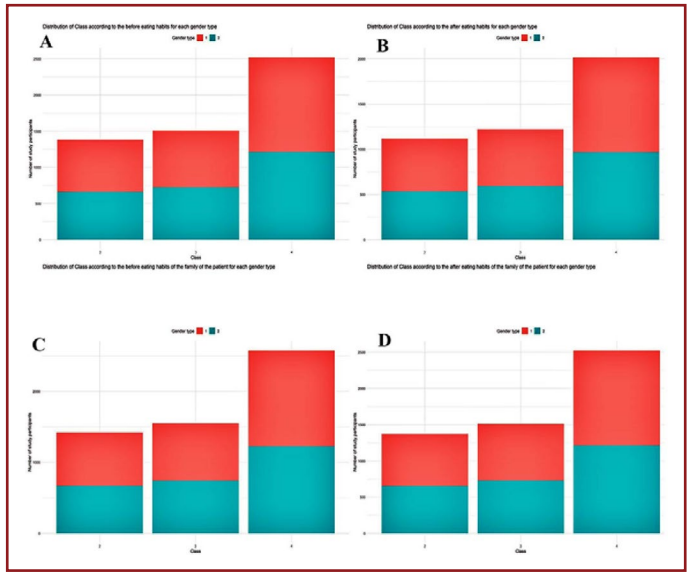

Figure 5. Distribution of the study participants according to the classes and gender based on the various eating habits of the participants and their parents. **(a)** Participants' distribution is based on the class they belong to and their gender regarding the handwashing before eating. **(b)** Participants' distribution based on the class they belong to and their gender regarding the handwashing after eating. **(c)** Participants' distribution based on the class they belong to and their gender regarding their family's instructions to wash hands before eating. **(d)** Participants' distribution based on the class they belong to and their gender regarding their families' instructions on handwashing after eating.

Table 2. Demographic characteristics of the study population (n=3462)

Demographic variables	Total number	Percentage
Age 8.81(±1.13) (Mean±SD)		
Gender		
Male	1663	48
Female	1799	52
One child sibling	1231	35.6
Two child sibling	2231	64.4
Class		
2	886	25.6
3	965	27.9
4	1611	46.5
Mother's education		
Primary	1589	(45.9)
Secondary	981	(28.3)
Higher	448	(12.9)
MBA or Ph.D.	444	(12.8)
Father's education		
Primary	1806	(52.2)
Secondary	913	(26.4)
Higher	245	(7.1)
MBA or Ph.D.	498	(14.4)

Analysis of the Participant's Knowledge

The students' understanding of the disease, pathogen, and hygiene was evaluated through the questionnaires that contained three parts: knowledge, attitude, and subjective norms. Table 1 presents the relevant questions and the response statistics as recorded from the survey. The awareness level of the students was found appreciable. A total of 90.4% (n=3129) of students were aware of the microbes and parasites, 86.4% (n=2991) were familiar with the existence of viruses (Table 1). However, only 13.6% of students knew that COVID-19 has been detected and damaged in China.

The mean score of the attitudes toward "washing hands before eating and after toilet" was 3.2 (±1.3). The mean score of the attitude toward "washing hands after touching animals and soil" was 2.9 (±1.2). The obtained mean score of "Washing hands for preventing microbes, parasites, and viruses" was 2.3 (±1.2). The followed and practiced hand washing rules before and after eating according to the class and gender of the students are shown in Figure 5a and b. Similarly, the advice provided by the parents and followed by the students in this regard is presented in Figure 5c and d.

Inferential analysis was done using Pearson's Chi-Square test test with Yates corrections to understand the possible relation of the awareness of COVID-19 and other hygiene factors (Table 3). Certain relations that included handwashing and immediate relative advice such as parents were found significant (Table 3). However, the activity and advice of the teachers and friends were not found statistically significant in comparison to the hygiene practice followed by self; however, the social influence of the friends cannot be ignored. Similarly, the analysis of the present data did not show the significant statistical relation of the parents' education concerning the students' awareness of COVID situations.

Table 3. Chi-square test results for the parameters considered (Significant outcomes are presented in red color)

Parameter1	Parameter2	X-squared	Degree of Freedom	p
COVID awareness	Hand wash after eating	46.341	1	0.0000
COVID awareness	Hand wash before eating	15.078	1	0.0001
COVID awareness	Family after eat	3.7352	1	0.0532
COVID awareness	Family before eat	34.28	1	0.0000
COVID awareness	Father does	11.122	1	0.0008
COVID awareness	Mother does	7.6698	1	0.0056
COVID awareness	Friend Does	0.0091163	1	0.9239
COVID awareness	Father's Education	0.2139	3	0.9753
COVID awareness	Mother's Education	0.24886	3	0.9693
COVID awareness	Home Wash	28.802	1	0.0000
COVID awareness	Teacher does before	0.18932	1	0.6635
COVID awareness	Teacher does after	0.15734	1	0.6916
COVID awareness	Wash Hand Defeat	0.45215	1	0.5013
Teacher does before	Teacher does after	5.705	1	0.0169

Discussion

Practicing proper hygiene is essential to maintain health and prevent diseases. Infectious diseases have been a concern for human survival and growth since ancient times. Infectious disease pandemics, such as Spanish flu and ongoing COVID-19, are evidence of the requirement of considering health and hygiene as a priority[12,16]. It is evident from past researches that managing hygiene at the community level and the personal level can indeed reduce the spread of any disease[7,10]. The WHO has issued several specialized guidelines in this context considering the importance of hygiene maintenance for better health and disease prevention (WHO guidelines). Reports of the WHO regarding handwashing suggested that hands are the primary carriers of infectious pathogens. Globally, only 20% of people follow the hygiene of the hands by washing with soap after defecating. Hand hygiene has been considered important due to its frequent contact with others and self, and possibilities of contact disease spreading[26,30]. Green et al.[30] reported the importance of hand hygiene for the food workers. In the case of children, the hand hygiene context is similar to that of the adults. Several primary schools worldwide do not have proper handwashing facilities. Proper handwashing reduces the risk of several communicable diseases as well. Despite these facts, sustained compliance with hand hygiene is not adequate, even among doctors and nurses the compliance rate is only 38.7%[23].

Alahdal et al.[31] recently reported the importance of attitude and practice of handwashing during the COVID-19 pandemic as worthy for hygiene and disease prevention.

In this study, children were instructed to wash their hands with soap and water for 20 s under the observation of the instructor. Independent of our questionnaire, before the training, children were asked if they washed their hands after coughing or sneezing. Only 35% of the students were washing hands after coughing, sneezing following the instruction. Hence, keen attention and observation are required for the children to practice hand hygiene. May be to develop the habit of proper handwashing is time-consuming for children. Van Beeck et al.[32] reported that in a Dutch daycare center, only 15% of children wash their hands properly before eating, 48% wash their hands after using the toilet, and after playing outside only 40% of children washes their hands. The negligence toward hand hygiene among the children and the caregivers are evident from the study outcome. Application of soap for hand hygiene among children was limited (13%) along with handwashing with relevance to other routine activities as reported by another study[33].

In the present study, we have observed that the handwashing habit of the children before eating and after the toilet was 3.2/5.2(±1.3) as per the Likert scale. Similar outcomes were witnessed in another study with a Likert scale value of 4.22 (±1.1). Similar comparable outcomes were present for washing hands after touching animals and soil among the children between the present study (2.9±1.2) and the report by Sun et al.[34] (4.29±1.05). Comparison of other factors such as the family's suggestion to wash hands before a meal and after toilet, after touching animals and soil were found comparable to the existing report of Sun et al.[34] Similar instructions from the teachers were also found comparable between the present study and the report by Sun et al.[34] with some variation in the scale values. Probably, the difference between the study population may have impacted slightly the average scale value deviations. Higher compliance with the teacher's suggestion was observed in the study reported by Assefa and Kumie in 2014[35]. In the present study, in the context of washing hands before eating or after using the toilet, and after touching the animals and soil, no important difference between parents' influence and teachers' influence on students was observed. However, there was some difference observed between COVID awareness and some sociodemographic parameters. Specific factors should be considered during the instruction providing, hygiene practices followed, and response recording. Often, we may miss crucial factors such as the effective application of soap[34]. The report suggests that specific and attractive instruction can increase the hygiene practices of hand wash and turn it into regular habits for children.[36] Although all the schools that were a participant in this study had toilets, tap water, and soap for handwashing, lack of attractive instructions such as direction paths involving foot or handprints reduced the study outcomes.

Conclusions

This study was conducted to understand the hygiene associated behaviors of the students who are trained in elementary classes. Continuous practice of better hygiene turns into a regular habit; hence, the acquired behaviors of the students were followed for 3 months. Positive behavioral changes were observed due to the continuity of the acquired hygiene practices in the children. The efforts of the school management and authorities using posters, verbal instructions, monitoring, and observations yielded better results. Visual instructions were found effective such as posters. Therefore, attractive efforts for hygiene such as the

use of colored fragrant protective soaps may also provide benefits. The present study suggested that children can follow the instructions when it is attractive; however, they may miss minute details while practicing hygiene; hence, careful observation and supervision are mandatory.

Ethics Committee Approval: The permission was obtained from the Social Sciences Ethics Committees before the data collection (Reference No: 29072019/14).

Peer-review: Externally peer-reviewed.

Authorship Contributions: Concept: A.K., A.M.; Design: A.K., A.M.; Supervision: A.K.; Fundings: A.K.; Materials: A.K.; Data Collection or Processing: A.K.; Analysis or Interpretation: A.K., A.M.; Literature Search: A.M.; Writing: A.M.; Critical Review: A.K., A.M.

Conflict of Interest: None declared.

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