http://jhmi.sums.ac.ir
Health Man & Info Sci 2022, 9(3), 145–153

HMIS
Health Management and Information Science

Original Article

"Parents' Attitude to School Reopening before the Emergence of Omicron Variant of SARS-CoV-2: A Retrospective Web-based Survey"

Alireza Mirahmadizadeh[1], Alireza Heiran[1], Roya Sahebi[2], Fatemeh Azadian[1], Reza Shahriarirad[3], Mohammad Hossein Sharifi[1]

[1]Non-communicable Diseases Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
[2]Student Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran
[3]Thoracic and Vascular Surgery Research Center, Shiraz University of Medical Sciences, Shiraz, Iran

Abstract

Introduction: Like many countries, in our country schools were reopened by September 2021, mainly because of massive personal and social costs due to the social distancing strategies. With the emergence of Omicron variant, questions are raised and still not fully answered about the causes of a noticeable increase in pediatric ICU admissions. Currently, schools have reopened. In this retrospective study, the parents' willingness to September 2021 school reopening was investigated.

Methods: We extracted data from approximately 3,700 parents. The data gathering tool was a self-administered, semi-structured, web-based survey, which was filled by the parents from July 18th, 2021 to August 3rd, 2021.

Results: Only 38.4% of parents agreed with school reopening. The most common reason parents were concerned with, irrespective of their agreement status, was full vaccination of students, teachers, and staff (83.6%); also, the most common concern that might have enforced the parents to consider school reopening was lower learning achievements at home using the online platforms (55.6%). Furthermore, full-time online learning was still the mostly preferred mode of reopening by the parents (43.48%).

Conclusion: The agreement with school reopening was low among the parents and their highest concern was full vaccination of students, teachers, and staff. During the longer closure, the impact on students will worsen; policymakers should accelerate and encourage the vaccination of young ages, supply safety measures, and retain the trust of the community for school reopening.

Keywords: COVID-19, Children, Student, Parent, School, School reopening, Reopening, Vaccine

Article History:
Received: 04 March 2022
Accepted: 03 June 2022

Please cite this paper as:
Mirahmadizadeh AR, Heiran AR, Sahebi R, Azadian F, Shahriarirad R, Sharifi MH. "Parents' Attitude to School Reopening before the Emergence of Omicron Variant of SARS-CoV-2: A Retrospective Web-based Survey". Health Man & Info Sci. 2022; 9(3): 145-153. doi: 10.30476/JHMI.2022.95736.1134.

***Correspondence to:**
Alireza Heiran,
Non-communicable Diseases Research Center, Shiraz University of Medical Sciences, Postal Code: 71936-35899, Shiraz, Iran
Tel: +98 9178326026
Email: heiran.alireza@gmail.com

Introduction

After the emergence of COVID-19 in China in December 2019, the World Health Organization (WHO) declared a state of the pandemic on March 11, and all public and private schools were closed by March 2020, the same as 195 other countries (1-3).

The function of schools through the pandemic is balancing the repercussions of suspending full-time classroom learning education versus health threats. There are behavioral, emotional, social, and economic aspects to contemplate, including the financial costs of school closure for parents that must stay home or finding a private caregiver to watch children, and the emotional and behavioral benefits of school reopening for children (4, 5).

On the other hand, according to evidence from a variety of reports, children are minimally affected by the illness and have low death rates (6, 7). Schools were reopened by September 2021; however, the role of children in the spread of SARS-CoV-2 has been yet to be known (8, 9). In addition, the predominance of *delta* variant of COVID-19 during those days, as well as the vaccination program expansion to 12-18 year old children (phase IV) from September 18, 2021, raised doubts about the reopening of schools leading to a higher chance of COVID-19 infection in children than former variants (10). Moreover, with the emergence of Omicron variant, concerns are remained mostly due to an exceptional influx of pediatric COVID-19 cases in pediatric Intensive Care Units (ICUs) (11). An explanation might be the delay in

school closure in the last week of January 2022 during the first weeks of Omicron spread after the September 2021 reopening, as well as insufficient attention to the families' willingness about school reopening.

There is diversity about views and concerns among parents about reopening the school for full-time classroom learning against online learning due to the perceived risks of COVID-19 (12, 13). Considering the just-mentioned situation, this might have appeared as a trade-off; that is, on the one hand, children's safety against the virus and, on the other hand, the problems related to the closure of schools and the possibility of reopening of schools. Whatsoever, we are on the verge of deciding on school reopening again. Therefore, it is necessary to assess our data during September 2021 reopening for a better decision; and parents' opinion is one of its major determinants. We studied the parents' willingness to September 2021 school reopening during the COVID-19 pandemic.

Materials and Methods

Data collecting forms were filled out by 3,700 parents from July 18th, 2021 to August 3rd, 2021, using non-probability, convenience sampling. The minimum sample size was calculated 3,700 parents, approximately, by assuming variables as 1-α=99% (corresponding Z of 2.576), prevalence of willingness=49% (14), precision of the estimate (d)=0.025, and design effect (DEFF)=1.4. The parent was included if he/she resided in Shiraz, Fars province, south of Iran, and had access to the Internet. Those who did not consent to participate were excluded from the study. If parents were illiterate, the data collecting form was filled by a literate family member.

The data collecting form was a self-administered, semi-structured, web-based survey which consisted of 21 questions, and took approximately 4-5 min to be completed; it included parents' and their students' demographic characteristics (First section, 8 questions) and parents' opinion about school reopening (13 questions) (Table 1). The second section of data collecting form contained multiple choice–single response (7 questions), multiple choice–multiple responses (2 questions), and Likert scale (4 questions). For this section, "Content Validity Ratio (CVR)" and "Face Validity" were tested on 100 parents for accuracy and clarity, by one faculty member of the health education department and two faculty members of the epidemiology department.

Then, this form was developed and uploaded as an online survey by the IT unit of the local University of Medical Sciences and sent via Porsline (an Online Survey Software; https://porsline.ir). The survey's link was sent via social media platforms. Respondents had to sign the online written informed consent before filling the survey. No identity data was obtained from participants. This study was approved by the Local Ethics Committee (code: IR.SUMS.REC.1400.005).

For statistical analysis, we used the R programing language (version 4.0.4 for MacOS). Descriptive statistics were obtained via the "R Base Package". Descriptive data were reported by frequency (percent) and mean±standard deviation (SD). For data visualization, we used Microsoft® Excel (version

Table 1: The online survey questions

Section 1. Demographic information
1. Respondent
2. Age of parents
3. Parents' education level
4. Parents' job
5. Living place
6.Student' sex
7. School stage
8. School type
Section 2. Parents' opinion about school reopening
1. Access to the online learning devices [single response, 3 choices]
2. Easily accessed to the internet [single response, 2 choices]
3. Online learning satisfaction [5-point Likert scale, dissatidfied to completely satisfied]
4. Overall educational performance satisfaction [5-point Likert scale, dissatidfied to completely satisfied]
5. Transportation [single response, 6 choices]
6. Concern with child health [3-point Likert scale; relatively, noticeably, seriously]
7. Parents' overall agreement to school reopening [single response, 2 choices]
8. Concerns for the conditions about school reopening [multiple responces, 16 choices]
9. Preferred mode of school reopening [single response, 5 choices]
10. Concerns or limitations that influenced parents to consider school reopening [multiple responces, 8 choices]
11. Concern of social media excessive use [5-point Likert scale, not concerned to completely concerned]
12. COVID-19 infection in a family member [single response, 3 choices]
13. Students' overall agreement to school reopening [single response, 2 choices]

16.43 for MacOS). The adjusted odds ratio (OR) with a 95% confidence interval (CI) was calculated by logistic regression using the "glm" function. Then, significant predictors of parents' willingness for school reopening were reported. A P value of <0.05 was considered statistically significant.

Results

Three thousand and three hundred eighty-eight parents (71.9% mothers with a mean age of 39.12±5.65 years and 28.1% fathers with a mean age of 44.75±6.65 years) filled out the data collecting form.

Table 2 shows the parents' and students' willingness

Table 2: Parents' and students' willingness for school reopening

Demographic variables				Variables related to availability of equipment, etc.			
Variable	**No. (%)**	**Willingness for school reopening [No. (%)]cw**		**Variable**	**No. (%)**	**Willingness for school reopening [No. (%)]**	
		Parents	**Students**			**Parents**	**Students**
Total	3,388	1,302 (38.4)	1,816 (53.5)	Total	3,388	1,302 (38.4)	1,816 (53.5)
Respondent				Easily accessed to the			
Father	953 (28.1)	368 (38.6)	479 (50.3)	internet	2,864 (84.5)	1,006 (35.1)	1,458 (50.9)
Mother	2,435 (71.9)	934 (38.4)	1,337 (54.9)	Yes	524 (15.5)	296 (56.5)	358 (68.3)
				No			
Age				Access to the online			
Father				learning devices			
25-40	287 (30.1)	106 (36.9)	157 (54.7)	Yes/personal	2,038 (60.2)	677 (33.2)	969 (47.5)
41-45	254 (26.7)	99 (39)	128 (50.4)	Yes/a family member	1217 (35.9)	536 (44)	746 (61.3)
>45	412 (43.2)	163 (39.6)	194 (47.1)	No	133 (3.9)	89 (66.9)	101 (75.9)
Mother				Concern with child health			
21-35	642 (26.4)	305 (47.5)	432 (67.3)	Seriously	1,994 (58.9)	367 (18.4)	808 (40.5)
36-40	892 (36.6)	312 (35)	482 (54)	Noticeably	919 (27.1)	525 (57.1)	610 (66.4)
>40	901 (37)	317 (35.2)	423 (46.9)	Relatively	475 (14)	410 (86.3)	398 (83.8)
Education				Overall educational			
Father				performance satisfaction			
High school or lower	172 (18.1)	78 (45.3)	99 (57.6)	Completely dissatisfied	221 (6.5)	177 (80.1)	173 (78.3)
Diploma	210 (22)	93 (44.3)	107 (51)	Dissatisfied	582 (17.2)	365 (62.7)	400 (68.7)
University degree	571 (59.9)	197 (34.5)	273 (47.8)	Neutral	342 (10.1)	180 (52.6)	224 (65.5)
Mother				Satisfied	1,469 (43.4)	424 (28.9)	708 (48.2)
High school or lower	285 (11.6)	167 (58.6)	202 (70.9)	Completely satisfied	774 (22.8)	156 (20.2)	311 (40.2)
Diploma	569 (23.4)	247 (43.4)	331 (58.2)				
University degree	1,581 (64.9)	520 (32.9)	804 (50.9)				
Job				Transportation			
Father				On foot	594 (17.5)	297 (50)	367 (61.8)
Freelancer	271 (28.4)	111 (41)	134 (49.4)	School shuttle services	996 (29.4)	378 (38)	549 (55.1)
Worker	78 (8.2)	36 (46.2)	41 (52.6)	Personal vehicle	1.160 (34.2)	455 (39.2)	634 (54.7)
Employee	237 (24.9)	82 (34.6)	121 (51.1)	Public transport services	116 (3.4)	40 (34.5)	49 (42.2)
Teacher	197 (20.7)	75 (38.1)	99 (50.3)	Other ways	44 (1.3)	14 (31.8)	23 (52.3)
Military	31 (3.3)	20 (64.5)	19 (61.3)	Not yet decided	478 (14.1)	118 (24.7)	194 (40.6)
Other jobs	139 (14.6)	44 (31.7)	65 (46.8)	Concern of social media excessive use			
Mother				Completely	776 (22.9)	423 (54.5)	535 (68.9)
Housewife	1,260 (51.7)	522 (41.4)	732 (58.1)	Noticeably	642 (18.9)	362 (56.4)	462 (72)
Freelancer	94 (3.9)	37 (39.4)	52 (55.3)	Relatively	926 (24.4)	283 (34.3)	419 (50.7)
Employee	396 (16.3)	151 (38.1)	217 (54.8)	Little	590 (17.4)	161 (27.3)	251 (42.5)
Teacher	409 (16.8)	132 (32.3)	205 (50.1)	Not concerned	554 (16.4)	73 (13.2)	149 (26.9)
Other jobs	276 (11.3)	92 (33.3)	131 (47.5)				
Residency				Online learning satisfaction			
Urban	2,915 (86)	1,052 (36.1)	1,496 (51.3)	Completely dissatisfied	542 (16)	442 (81.5)	448 (82.7)
Rural	473 (14)	250 (52.9)	320 (67.7)	Dissatisfied	821 (24.2)	517 (63)	592 (72.5)
Student' sex				Neutral	415 (12.2)	146 (35.2)	216 (52)
Boy	1,871 (55.2)	723 (38.6)	949 (50.7)	Satisfied	1,150 (33.9)	176 (15.3)	454 (39.5)
Girl	1,517 (44.8)	579 (38.2)	867 (57.2)	Completely satisfied	460 (13.6)	21 (4.6)	103 (22.4)
School stage				COVID-19 infection in a			
Elementary school	1,985 (58.6)	772 (38.9)	1,151 (58)	family member			
Middle school	886 (26.2)	314 (35.4)	410 (46.3)	Positive	1,539 (45.4)	540 (35.1)	792 (43.6)
High school	517 (15.3)	216 (41.8)	255 (49.3)	Suspicious	256 (7.6)	99 (38.7)	135 (52.7)
				Negative	1,593 (47)	663 (41.6)	889 (55.8)
School type							
Public	2,518 (74.3)	1,014 (40.3)	1,341 (53.3)				
Private	870 (25.7)	288 (33.1)	475 (54.6)				

to school reopening. Students more agreed with school reopening compared to the parents (53.5% and 38.4%, respectively), while the willingness rate was not varied by the parents' sex (~38%) and the fathers' age groups (~37-40%); younger mothers more agreed with school reopening (47.5%) than the older ones. It was expected that parents with university-level education agreed less with school reopening by at least a 10% difference. Also, generally, parents who were employed and were receiving fixed monthly salaries showed a lower level of agreement. The willingness rate was higher among parents who resided in rural areas or those whose children were at public schools. Moreover, parents' willingness was lower if they were seriously concerned with their child's health, completely satisfied with online learning, completely satisfied with their children's educational performance, not concerned about social media excessive use, had access to online learning devices, had easy access to the Internet, and had a COVID-19 positive family member, by 76.9, 67.9, 59.9, 43.2, 33.7, 21.4, and 6.5% difference, respectively, with those who had the highest willingness rates (Table 2).

The most common reasons that parents were concerned about school reopening, irrespective of their agreement status, were full vaccination of students, teachers, and staff (83.6%), regular surface disinfection (60%), and effective ventilation and air conditioning (57.2%). The least concern was about cancelling the rest times at schools (8.2%) (Figure 1).

The most common concerns or limitations that might be enforced for parents to consider school reopening, irrespective of their agreement status, were lower learning achievements at home using the online platforms (55.6%), dependence or addiction to social media (28.8%), and social dissociation and isolation (26.4%). The least concern was about food and nutritional coverage mostly at school (1%). Thirty-one percent of parents claimed no concern or limitation (Figure 2).

In line with 62% of total disagreement with school reopening, full-time online learning was the most preferred mode of reopening by the parents (43.48%), followed by combined classroom/online learning (27.3%), and full-time classroom learning (24.2%) (Figure 3).

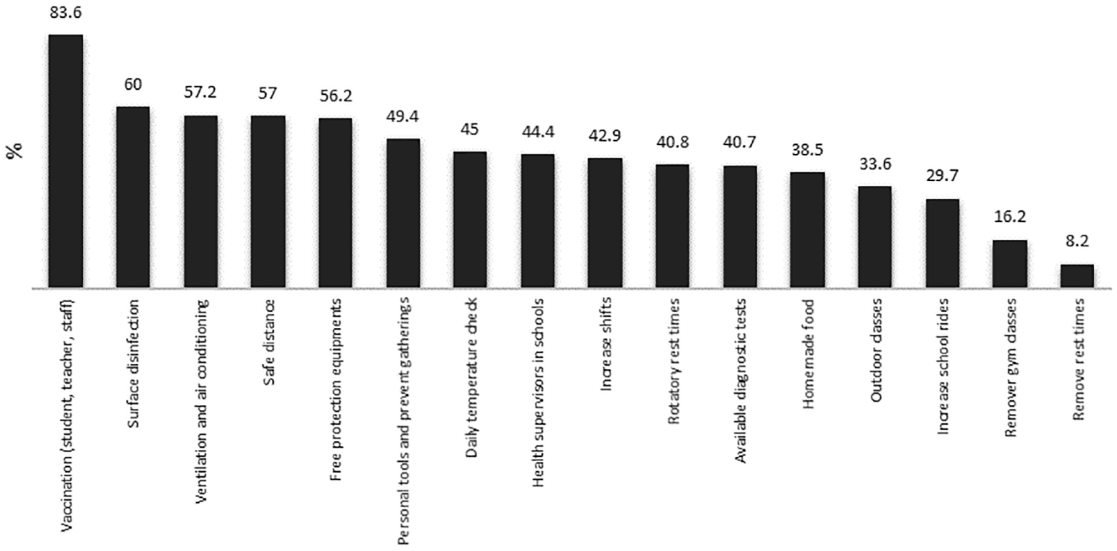

Figure 1: Parents' concerns for the conditions about school reopening irrespective of their agreement status.

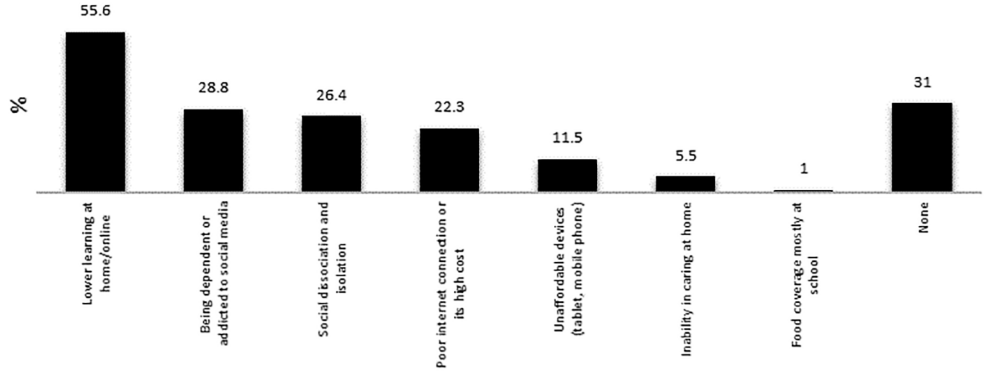

Figure 2: Concerns or limitations that influenced parents to consider school reopening irrespective of their agreement status.

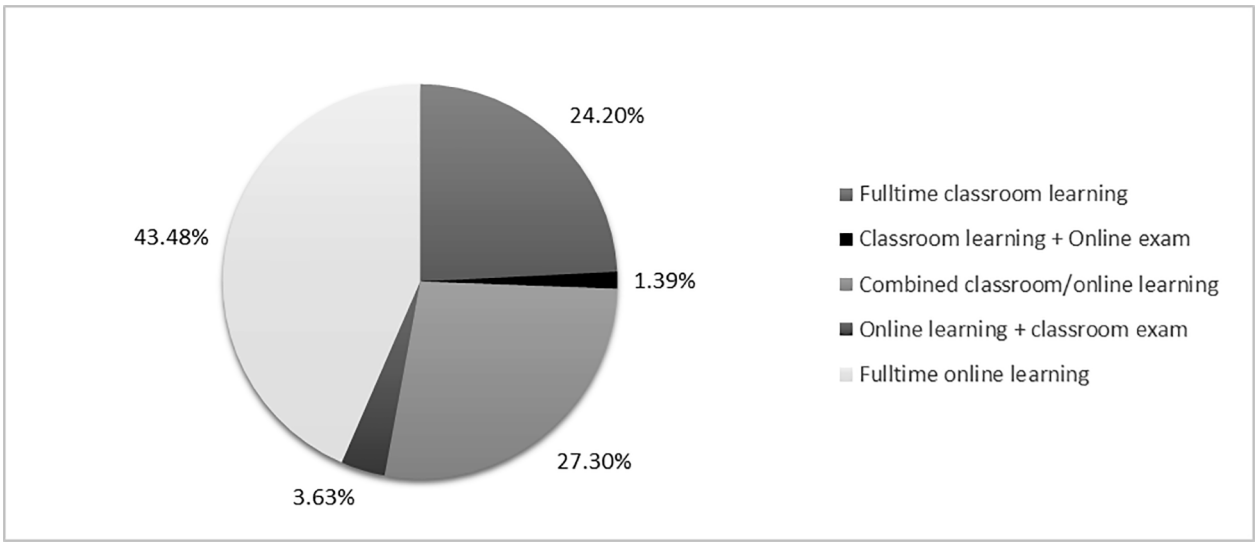

Figure 3: Parents' attitude on the mode of school reopening.

Table 3: Significant predictors of parents' unwillingness for school reopening using multivariate logistic regression

Variable	OR	95% CI	$P_{adjusted}$
Mother's education			
University degree	0.561	0.377–0.834	0.004
Father's job			
Employee	0.642	0.464–0.887	0.007
Military	1.799	1.049–3.087	0.033
Access to the online learning devices			
Yes/personal	0.508	0.294–0.877	0.015
Yes/a family member	0.556	0.330–0.939	0.028
COVID-19 infection in a family member			
Positive	0.741	0.597–0.918	0.006
Concern of social media excessive use			
Relatively	0.627	0.469–0.838	0.002
Little	0.555	0.397–0.776	0.001
Not concerned	0.331	0.222–0.495	<0.001
Concern with child health			
Seriously	0.03	0.021–0.042	<0.001
Noticeably	0.187	0.132–0.264	<0.001
Overall educational performance satisfaction			
Dissatisfied	0.600	0.374–0.962	0.034
Satisfied	0.607	0.378–0.976	0.039
Online learning satisfaction			
Dissatisfied	0.311	0.222–0.436	<0.001
Not satisfied or dissatisfied	0.123	0.082–0.183	<0.001
Satisfied	0.041	0.028–0.061	<0.001
Completely satisfied	0.015	0.008–0.029	<0.001

Using logistic regression, we found that mothers'university degree employed fathers who received a fixed monthly salary, parents who had yielded online learning devices for their child, those with a positive history of COVID-19 infection in a family member, parents less concerned about social media excessive use, those highly concerned about their child's health, parents with both satisfaction and dissatisfaction about overall educational performance, and higher satisfaction about online learning were the significant predictors of the parents' unwillingness for school reopening. All other variables were not statistically significant (P>0.05). The most important variable was serious concern about the child's health (OR: 0.03; 95% CI: 0.021, 0.042; P<0.001) (Table 3).

Discussion

With approximately one and a half years of living with the COVID-19 pandemic, schools closed as a part of a health strategy to decrease the chance of transmission; however, it showed that school closure

would prevent only 2-4% of deaths, which is much smaller than other social distancing measures taken (9). In addition, by prolonged social distancing measures, and obvious and massive personal and social costs due to school closure have made school reopening an urgent priority (15, 16). However, in our survey, only 38.4% of the parents agreed with school reopening before September 2021 reopening. Agreement was lower than similar studies conducted in the United States (Chua et al.=71.0% (17), Kroshus et al.=49% (14), Meghani et al.=50% (18)).

Several studies from developed countries have reported evidence that schools could be opened safely, with significantly lower rates of school transmissions compared to the community. The results of these studies can be summarized as follows. First, the actual number of school-related transmissions was much lower than what was expected. Second, none of the school-related transmissions was a child-to-adult transmission. And, third, the chance of spread by students who contracted the virus was low (19-23). However, challenges cannot be neglected in low-to-middle income economies, especially when economic inequality is also presented. In other words, the benefit-harm trade-off about school reopening would be different in low-to-middle income countries for the policy makers (15, 24).

In such countries, the community vaccination rate is (relatively) low and the prevalence of positive cases is still high (15, 21). According to the local portal of COVID-19 statistics (https://dashboard.sums.ac.ir/home.aspx) in University of Medical Sciences, 70.9 and 73% of 12-14- and 15-17-year age groups have received at least two doses of a vaccine against COVID-19 till March 1st, 2022. These values can account for a major advantage compared to the September 2021 schools reopening when phase IV of the national vaccination program (covering 12-18 years old children) had not been initiated; yet, the gap between three-dose and two-dose vaccinated people is still warning. However, concerns remain about younger children; that is, for example, only 8.87% of 10-11-year-old children are fully vaccinated with at least 2 doses of a vaccine till March 1st, 2022, while preschools and elementary schools are usually the priority in schools reopening due to significant harms during school closure (16, 25). Interestingly, we found that full vaccination of students, teachers, and staff was the most common concern among parents about school reopening (83.6%). Moreover, "low transmission rate in schools" would be achieved if rigorous transmission mitigation measures are prioritized (26, 27). Parents were also concerned about regular surface disinfection and effective ventilation and air conditioning, which all are strictly linked to the performance of the health surveillance system to ensure rigorous transmission mitigation measures for school reopening. In general, school reopening would be challenging in this context since the risk of transmission cannot be neglected, especially amongst adults that are connected to the school system as the vast majority of the parents and teachers have not been vaccinated so far (15, 24).

Generally, during COVID-19 pandemic, everyday life in children negatively altered toward prolonged social isolation, increased television or screen time, decreased physical activity, and increased learning anxiety (16). However, these consequences were partly inevitable because of the widespread implementation of mitigating measures. Similarly, in our study, parents declared that the most common reasons that might have enforced them to consider school reopening, irrespective of their agreement status, were lower learning achievements through online platforms, dependence or addiction to social media, and social dissociation and isolation.

From the past days of COVID-19 era, it was found that online learning has been accompanied with "education and achievement gaps" (28). Apparently, this may be explained by the notion of "advantaged vs. disadvantaged children" (16, 24). That is, in addition to the complete satisfaction with online learning and children's educational performance, we showed that parents with higher education and employed parents who received fixed monthly salary, residents of urban areas, those with access to the online learning devices and the Internet, and those whose children were learning at private schools agreed less with school reopening. All of these characteristics might be linked to the financial status of a family. More importantly, these financial disparities have been embedded in society even before COVID-19 era. As a result, the government should focus on the pandemic characteristics in case of the urgent need to school reopening. In support of our claim, similar multivariable analyses from the United States did not show any association between willingness and the studies' variables (18), or showed negative association with a different set of variables (17), or even was in contrast with our survey as Kroshus et al. (14), which showed that parents having lower income, being unemployed, and having a flexible job agreed less with school reopening. One can conclude that the determinants of willingness about school reopening might be generally related to the socioeconomic status of a community.

We found that most of the parents disagreed with school reopening; however, in the case of reopening, they preferred combined classroom/online learning. It appears that a conservative staged classroom reopening in combination with online learning might be a good approach. The first group, perhaps, would be the preschools and elementary schools due to the extremely low rate of severe infection, the least role in transmission, and significant harms during school closure (16, 25). Interestingly, Sweden government kept preschools and primary schools open, which did not accompany with more hospitalized COVID-19 children (29). And the last group would be the secondary schools, which may pose the least priority for reopening since adolescents have higher risk for severe infection, transmit the virus much like adults, and behave socially, all of which can promote the spread of the infection.

It is recommended that school reopening should be considered if the epidemic curve in a community is under control and lasts for a prolonged period (30). Currently, our country is one of the world's most eminent countries, as it still experiences the sixth peak with a high daily rate of new cases and deaths. Importantly, the predominance of Omicron variant during this peak has caused more hospitalizations in children than in previous peaks. This is suggested that the variant's extremely high transmissibility, as well as lower vaccination coverage in children, might have led to this disproportionate amount of pediatric hospital admissions (11, 31). A specific explanation in the case of our country might be the procrastination in school closure during the first weeks of Omicron predominance after the September 2021 reopening, as well as insufficient consideration of the families' willingness about school reopening. All and all, we believe that, at this time, policymakers should decide conservatively to reopen schools and use the experiences of the previous reopening: Any new policy should be considered when this peak in the community is controlled. Vaccination program should encourage people for receiving a booster shot, and families should vaccinate their children, especially 5-11-year-old children, with offered authorized vaccines. In addition, safety measures should be available and monitored at schools.

Our study had at least three limitations. First, the participants were selected from the urban area that potentially limit the generalizability of our findings. Second, participants required access to a device with Internet access to fill the online survey that limited this study to individuals with the resources and technology to access the Internet. Therefore, this study might not represent households with lower levels of education and low-income ones. And third, we were not able to calculate the response rate to the survey as we were unable to assess how many people observed the survey.

Conclusion

Parents disagreed with September 2021 school reopening more; and their highest concern was full vaccination of students, teachers, and staff. While the impact of longer closure on students will worsen, the authorities and government should accelerate and encourage the vaccination of children and take safety measures, to retain the trust of the community for school reopening.

Funding

The present article was financially supported by the deputy chancellor of Shiraz University of Medical Sciences [Grant No:23940].

Acknowledgement

The authors wish to thank the Research Affairs Department of local University of Medical Sciences for their financial support.

Authors' Contribution

Conception and designing of study (AM, AH, RSh); Data collection (RS, FA, RSh); Data analysis (AM, RS); Manuscript drafting (AH); Critical revision (AM, AH, RSh); Manuscript supervision (AH); Supervision of work (AM).

Ethics Committee Approval

This study was approved by Shiraz University of Medical Sciences Local Ethics Committee (code: IR.SUMS.REC.1400.005).

Availability of Data and Material

Data will be shared upon request by the corresponding author.

Conflict of Interest: None declared.

References

1. UNPbtioC-oc [Internet]. c2020. Available from: https://unsdgun.org/sites/default/files/2020-04/160420-Covid-Children-Policy-Brief.pdf
2. Organization WH [Internet]. WHO Characterizes COVID-19 as a Pandemic. [Cited 11 March 2020]. Available from: https://www.paho.org/en/news/11-3-2020-who-characterizes-covid-19-pandemic

3. Agency TN. Iran Extends Closure of All Schools, Universities due to COVID-19. [05 March 2020]. Available from: https://www.tasnimnews.com/en/news/2020/03/05/2217447/iran-extends-closure-of-all-schools-universities-due-to-covid-19
4. Ranjbar K, Hosseinpour H, Shahriarirad R, Ghaem H, Jafari K, Rahimi T, et al. Students' attitude and sleep pattern during school closure following COVID-19 pandemic quarantine: a web-based survey in south of Iran. *Environ Health Prev Med*. 2021;26(1):33. doi: 10.1186/s12199-021-00950-4.
5. Mirahmadizadeh A, Ranjbar K, Shahriarirad R, Erfani A, Ghaem H, Jafari K, et al. Evaluation of students' attitude and emotions towards the sudden closure of schools during the COVID-19 pandemic: a cross-sectional study. *BMC Psychol*. 2020;8(1):134. doi: 10.1186/s40359-020-00500-7.
6. Ludvigsson JF. Systematic review of COVID-19 in children shows milder cases and a better prognosis than adults. *Acta Paediatr*. 2020;109(6):1088-95. doi: 10.1111/apa.15270.
7. Barton M, Mehta K, Kumar K, Lu J, Le Saux N, Sampson M, et al. COVID-19 infection in children: estimating pediatric morbidity and mortality. *medRxiv*. 2020. doi: 10.1101/2020.05.05.20091751.
8. Viner RM, Mytton OT, Bonell C, Melendez-Torres GJ, Ward J, Hudson L, et al. Susceptibility to SARS-CoV-2 Infection Among Children and Adolescents Compared With Adults: A Systematic Review and Meta-analysis. *JAMA Pediatr*. 2021;175(2):143-56. doi: 10.1001/jamapediatrics.2020.4573.
9. Viner RM, Russell SJ, Croker H, Packer J, Ward J, Stansfield C, et al. School closure and management practices during coronavirus outbreaks including COVID-19: a rapid systematic review. *Lancet Child Adolesc Health*. 2020;4(5):397-404. doi: 10.1016/S2352-4642(20)30095-X.
10. Anthes E, Times NY [Internet]. The Delta Variant Is Sending More Children to the Hospital. Are They Sicker, Too? c2021. Available from: https://www.nytimes.com/2021/08/09/health/coronavirus-children-delta.html
11. Iran True [Internet]. Iran Coronavirus February 5 O, Children & Regime Gatherings. [05 February 2022]. Available from: https://irantrue.com/iran-coronavirus-february-5-2022-omicron-children-regime-gatherings/
12. UNICEF Montenegro [Internet]. Parents are concerned, but supportive of school reopening: Parents' attitudes on education during the COVID-19 pandemic. [Cited 24 September 2020]. Available from: https://www.unicef.org/montenegro/en/stories/parents-are-concerned-supportive-school-reopening
13. Pudjiadi AH, Putri ND, Sjakti HA, Yanuarso PB, Gunardi H, Roeslani RD, et al. Parents' Perspectives Toward School Reopening During COVID-19 Pandemic in Indonesia-A National Survey. *Front Public Health*. 2022;10:757328. doi: 10.3389/fpubh.2022.757328.
14. Kroshus E, Hawrilenko M, Tandon PS, Christakis DA. Plans of US Parents Regarding School Attendance for Their Children in the Fall of 2020: A National Survey. *JAMA Pediatr*. 2020;174(11):1093-101. doi: 10.1001/jamapediatrics.2020.3864.
15. Viner RM, Bonell C, Drake L, Jourdan D, Davies N, Baltag V, et al. Reopening schools during the COVID-19 pandemic: governments must balance the uncertainty and risks of reopening schools against the clear harms associated with prolonged closure. *Arch Dis Child*. 2021;106(2):111-3. doi: 10.1136/archdischild-2020-319963.
16. World Health Organization [Internet]. School reopening can't wait. WHOSrct. Available from: https://www.who.int/westernpacific/news/commentaries/detail-hq/school-reopening-can-t-wait
17. Chua KP, DeJonckheere M, Reeves SL, Tribble AC, Prosser LA. Factors Associated With School Attendance Plans and Support for COVID-19 Risk Mitigation Measures Among Parents and Guardians. *Acad Pediatr*. 2021;21(4):684-93. doi: 10.1016/j.acap.2020.11.017.
18. Meghani A, Agarwal S, Zapf AJ, Edwards JG, Labrique A, Gibson D. Schooling amidst a pandemic: parents' perceptions about reopening schools and anticipated challenges during COVID-19. *Medrxiv*. 2021. doi: 10.1101/2021.03.02.21252777.
19. Zimmerman KO, Akinboyo IC, Brookhart MA, Boutzoukas AE, McGann KA, Smith MJ, et al. Incidence and Secondary Transmission of SARS-CoV-2 Infections in Schools. *Pediatrics*. 2021;147(4). doi: 10.1542/peds.2020-048090.
20. Falk A, Benda A, Falk P, Steffen S, Wallace Z, Hoeg TB. COVID-19 Cases and Transmission in 17 K-12 Schools - Wood County, Wisconsin, August 31-November 29, 2020. *MMWR Morb Mortal Wkly Rep*. 2021;70(4):136-40. doi: 10.15585/mmwr.mm7004e3.
21. Nature [Internet]The Seciences Behind School Reopenings. [08 July 2021]. Available from: https://media.nature.com/original/magazine-

assets/d41586-021-01826-x/d41586-021-01826-x.pdf
22. Hershow RB, Wu K, Lewis NM, Milne AT, Currie D, Smith AR, et al. Low SARS-CoV-2 Transmission in Elementary Schools - Salt Lake County, Utah, December 3, 2020-January 31, 2021. *MMWR Morb Mortal Wkly Rep*. 2021;70(12):442-8. doi: 10.15585/mmwr.mm7012e3.
23. NSW Health [Internet]. COVID-19 in schools – the experience in NSW. [Cited 26 April 2020]. Available from: https://ncirs.org.au/sites/default/files/2020-04/NCIRS%20NSW%20Schools%20COVID_Summary_FINAL%20public_26%20April%202020.pdf
24. Malala Fund [Internet]. Girls' education and COVID-19: What past shocks can teach us about mitigating the impact of pandemics. c2020. Available from: https://www.ungei.org/publication/girls-education-and-covid-19-what-past-shocks-can-teach-us-about-mitigating-impact
25. Fantini MP, Reno C, Biserni GB, Savoia E, Lanari M. COVID-19 and the re-opening of schools: a policy maker's dilemma. *Ital J Pediatr*. 2020;46(1):79. doi: 10.1186/s13052-020-00844-1.
26. Gurdasani D, Alwan NA, Greenhalgh T, Hyde Z, Johnson L, McKee M, et al. School reopening without robust COVID-19 mitigation risks accelerating the pandemic. *Lancet*. 2021;397(10280):1177-8. doi: 10.1016/S0140-6736(21)00622-X.
27. Stein-Zamir C, Abramson N, Shoob H, Libal E, Bitan M, Cardash T, et al. A large COVID-19 outbreak in a high school 10 days after schools' reopening, Israel, May 2020. *Euro Surveill*. 2020;25(29). doi: 10.2807/1560-7917.ES.2020.25.29.2001352.
28. Willyard C. The science behind school reopenings. Nature Portfolio Heidelberger Platz 3, Berlin, 14197, Germany; 2021.
29. ECDC. COVID-19 in children and the role of school settings in COVID-19 transmission. ECDC Stockholm; 2020.
30. Day M. Covid-19: European officials warn that exiting lockdown will be "very long" and will require cooperation. *BMJ*. 2020;369:m1549. doi: 10.1136/bmj.m1549.
31. Kozlov M. Does Omicron hit kids harder? Scientists are trying to find out. *Nature*. 2022. doi: 10.1038/d41586-022-00309-x.