

## An Assessment Of Secondary School Preparedness In Responding To Covid-19 Epidemic In Rawalpindi, Pakistan: Implications And Limitations

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Article Info	Abstract
<p><b>Article History</b></p> <p>Received: May 24, 2021</p> <p>Accepted: December 29, 2021</p> <hr/> <p><b>Keywords :</b> COVID-19 Pandemic, School Closure &amp; Preparedness, Preventive Measures</p> <p><b>DOI:</b> 10.5281/zenodo.5809254</p>	<p><i>As long as COVID-19 prevails, safe operations of schools are contingent upon formulating a preparedness plan to take reasonable measures to protect the health of students and school staff. We investigated the levels of awareness and preparedness for COVID-19 epidemic among staff in publicly administered schools in Rawalpindi district, Pakistan and assessed preventive measures undertaken for an infection free environment. Two hundred secondary schools in district Rawalpindi, participated in this cross-sectional study. Interview data from 400 school principals and administrators were collected using an interview questionnaire and a school profile checklist was filled through observing preparedness indicators. A mean score within each domain of knowledge, preparedness and practices, was calculated and scores among schools were compared using one-way ANOVA. Respondents were fairly knowledgeable about protection and transmission of COVID-19. However, preparedness and practices of public health measure was inadequate. Although 85%, schools have assigned focal person and 73% reported about sharing school preparedness policy, more disease-specific preparedness including room allocation to isolate suspected COVID-19 cases was established in 46% schools while only 14% of schools had thermometers to check temperature. Results of ANOVA showed significant differences among schools types across each domain of knowledge (<math>p</math> value &lt; 0.05), preparedness (<math>p</math> value &lt; 0.05), and practices (<math>p</math> value &lt; 0.01). Schools are not well equipped to confront COVID-19 and the level of preparedness is inadequate to ensure a safe environment. The training of school staff and monitoring mechanism to support implementation of safety guidelines is contingent.</i></p>

### Introduction

The introduction should briefly place the study in a broad context and highlight why it is important. It should define the purpose of the work and its significance. The current state of the research field should be carefully reviewed and key publications cited. Please highlight controversial and diverging hypotheses when necessary. Finally, briefly mention the main aim of the work and highlight the principal conclusions. As far as possible, please keep the introduction comprehensible to scientists outside your particular field of research. References should be numbered in order of appearance and indicated by a numeral or numerals in square brackets—e.g., [1] or [2,3], or [4–6]. See the end of the document for further details on references.

COVID-19 pandemic has posed serious threats to human health and wellbeing on a global scale, besides impacting individuals' and countries' economic stability, social security and development [i]. To contain the epidemic, countries have adopted various non-medical interventions i.e., nationwide lockdowns and social distancing measures leading to a closure of schools [ii]. These interventions significantly impacted the education sector as transitioning from the traditional face-to-face learning to an online learning process, posed significant challenges for both the teachers and students, without giving them ample time to adapt to this new panacea of learning [iii]. The continuous debate among Public health planners about schools and children not being the primary drivers of the pandemic have added to the confusion around the decision to keep educational institutions closed during the epidemic [iv, v].

An analysis of data from 157 countries has shown that COVID-19 could result in a loss of between 0.3 and 0.9 years of schooling, bringing down the effective years of basic schooling that students achieve during their lifetime from 7.9 years to between 7.0 and 7.6 years [vi] Another global survey showed that 188 countries had to initially close down education institutions, which forced almost 1.5 billion students out of schools; a large majority of these students are enrolled in primary and secondary schools [vii]. The South Asian region has been experiencing a lingering crisis in education even before the pandemic hit the region. Conservative estimates show that 95 million children were already out of school, and the pandemic-related school closure has affected

another 430 million children in South Asia alone, who are now in danger of dropping out of the education system if alternative strategies are not adopted by school systems to offer education to children [viii, ix, x, xi].

While most developed countries started to adopt online learning mechanisms to continue offering educational services to students at home, the developing world face additional challenges due to limited access to technology and online connectivity issues as only 35% of the people have access to the Internet [xii]. In Pakistan, creating educational access is a long-standing concern as the country faces the daunting challenge of educating around 19 to 25 million out of school children in schools, who represent 44 percent of the youth in 5-16 years age group [xiii, xiv]. Contingent on the escalating or plummeting number of coronavirus cases in Pakistan, school opening and closure has been an intermittent phenomenon which has been used as a mitigative strategy to control the community spread of COVID-19 [xv]. Since 63% of Pakistan's population dwells in rural areas and only 28% of the total country's population has access to Internet, personal computers etc., online schooling and long distance education is not an immediate substitute of in-school education in Pakistan [12, 13]. As long as the pandemic prevails, reopening schools is contingent upon formulating a preparedness plan to take reasonable measures to protect the health, safety and wellbeing of students, staff, teachers and their families [14, xvi, xvii].

A "Pakistan national education response and resilience plan (K-12) for COVID-19" was there formulated as a guidance document for schools to implement COVID-19 related SOPs to ensure safe school environment and most importantly by providing psychosocial and physical health support to the students as well as the school staff [xviii]. This research study investigated the levels of awareness and preparedness concerning COVID-19 epidemic among school staff in publicly administered schools in Rawalpindi district, Pakistan. It also assessed various preventive measures undertaken by the school administration at an individual and workplace level, for an infection free environment. The results of this study will draw implications for school preparedness to respond to future epidemics, ensuring a safe school environment for students' health, wellbeing, and safety.

## 2. Materials and Methods

**Study Design & Participants:** A cross sectional study design was used to collect data from the government administered secondary schools in district Rawalpindi, within three randomly selected regions i.e., (Rawalpindi city, WahCantt and Chaklala). Rawalpindi district has a population of approximately 5.4 million, and is located in the northern part of Punjab province, which is the most populous province in Pakistan [xix]. Out of a list of 224 secondary schools in the selected regions, 200 schools were found functional and were invited to participate in this study. These included 30 Federal Government Educational Institutions (FGEI) and 170 public schools administered under Punjab Government consisting of both rural (PGR) and urban (PGU) based schools. Data were collected between 20th September 2020 to 15 February 2021—after receiving prior administrative approvals from the relevant authorities of the aforementioned units prior to phase-wise-re-opening of the schools.

**Instruments:** Two instruments were used in this study: An "interview questionnaire" for school principals and administrators and a "School profile checklist". Both instruments were developed using "Pakistan national education response and resilience plan (K-12) for COVID-19" and the "Checklist on Safe School Environments & Checklist for School Administrators, Teachers and Staff". It was supportive to design both the instruments congruent in content areas for cross checking the status of preparedness. The questionnaire included information on the respondent's knowledge of COVID 19 and various preparatory efforts undertaken by the school for a safe COVID-free environment. The Checklist evaluated safe practices and physical measures taken by the school to limit the transmission of COVID 19. Both instruments were pilot tested with a sample of 10 male and 10 female high school administrators and their feedback and inputs were incorporated in the finalized instruments used for data collection.

**Procedures:** Field data collection was preceded by a preparation phase that focused on getting approvals from the relevant authorities of FGEI & Punjab Education District Office. The project team had several meetings with the concerned authorities, worked alongside school health services to discuss the implications of this study and develop an understanding of the precautionary measures taken by the Punjab Government for reopening the schools. These discussions provided useful inputs into the development of the survey tools and also helped the team during execution of this study. The data collection team comprised of graduate students with prior knowledge of field research in school settings who were supervised by a team of researchers from the Fatima Jinnah University Rawalpindi and University of Manitoba Canada.

The field teams were trained in a three days training conducted by the senior research team. The training focused on providing information and points of clarification to the interviewers on basic interviewing skills and introducing various sections of the questionnaires, communications skills and interviewing techniques and how to gather information on check lists by observing various preventive practices. The teams were also provided basic information on COVID-19 and how to implement this study safely by following government provided safety procedures i.e., using facemasks and hand sanitizers regularly while maintaining safe distance.

Each data collection teams included a senior research associate and a junior research officer who visited the schools at a pre-arranged time agreed by the school administration. Data were collected by interviewing the

school principals and administrators in a face-to-face interview conducted by the senior research associate, which lasted for approximately 25 minutes. A written informed consent was sought from all the participants before participating in this study assuring their anonymity and confidentiality of the data. After getting questionnaire information, the study teams visited various sections of the school along with an administrative staff member, and observed the implementation of various COVID 19 related practices, which were noted on the School profile checklist. The data collection process took approximately one and half-hours on average within each school.

**Data Analysis:** All questionnaires and checklists were provided a unique identifying code and were field edited by the senior research associate in the field. In the office, the data manager checked the questionnaires for completeness and appropriateness of responses and after a thorough editing was entered into a database specifically designed for this study. The final data set was converted to SPSS™ files for analysis. The electronic data was password protected and only authorized officials had access to the data files.

Data analysis, which included both descriptive and inferential analysis, was conducted using SPSS version 23.0. Initially frequencies and percentages were used to interpret the data about school profile, demographic characteristics, and responses of administrators about their knowledge, preparedness and practices in responding to COVID-19 epidemic. Within each domain of knowledge, preparedness and practices, 9, 15 and 13 key variables were selected to calculate a mean score within each domain, by giving a score of one for each correct response and no score for an incorrect response. The possible differences in the average score among various schools [FGE, PGU, PGR] were compared using one-way ANOVA.

All ethical considerations to conduct research with human subjects were followed. A written informed consent was sought from all the participants before participating in this study and strict measures were taken to ensure the confidentiality of the participants and the institutions. This included non-use of personal identifiers, use of password protected electronic data files and access of data files to authorized individuals only.

### 3. Results

A total number of 400 interviews were conducted with the principals and administrators in the 200 functional schools within the selected regions. In addition to conducting these interviews, a checklist (n=200) was filled for each school. Among these 200 schools, 30 schools were Federal Government Educational Institutions (FGEI) and the remaining 170 public schools were run under Punjab Government consisting of both rural (PGR=72) and urban (PGU=98) based schools.

**Table 1: School Profile and Demographic Characteristics of the Respondents of Secondary Schools Across District Rawalpindi, 2020**

Districts	Total/200 N (%)	FGEI N (%)	PGU N (%)	PGR N (%)
<b>SCHOOL PROFILE</b>				
<b>No of Schools</b>	92 (100)	30 (15)	98 (49)	72 (36)
<b>Type of School</b>				
• Girls only	99 (49.5)	16 (53.3)	53 (54.1)	30 (41.7)
• Boys only	97 (48.5)	12 (40)	42 (42.9)	42 (58.3)
• Co-education	4 (2.0)	21 (6.7)	3 (3.5)	00
<b>Region of School</b>				
• Rawalpindi city	187 (93.5)	17 (56.7)	98 (100)	72 (100)
• WahCantt	8 (4)	8 (26.7)	00	00
• Chaklala	5 (2.5)	5 (16.7)	00	00
Number of students*	715±493	872±271	820±583	508±340
Number of teachers and other staff *	54±28	71±26	61±31	38±14
Number of class rooms *	16±8	21±7	18±10	12±4
Number of all rooms excluding class room *	20±3	6±3	4±6	3±3
Availability of toilet facility	48 (24)	13 (43.3)	28 (27.5)	6 (8.3)
Health care facility within the school	82 (41)	23 (76.6)	43 (43.8)	15 (21)
<b>RESPONDENT CHARACTERISTICS</b>				
<b>Gender</b>				
• Male	172 (43)	19 (31.6)	78 (40)	70 (49)

• Female	228 (57)	39 (65)	98 (50)	73 (51)
<b>Age of the respondent in completed years</b>				
• Below 30 yrs.	9 (2.2)	2 (3.3)	2 (1.02)	5 (3.5)
• 30-40 yrs.	113 (28.2)	10 (16)	55 (28)	47 (33)
• 41-50 yrs.	226 (56.5)	37 (62)	103 (53)	83 (58)
• 51-60 yrs.	52 (13)	10 (16)	33 (17)	7 (5)
<b>Academic Qualification</b>				
• Ph.D. / M.Phil.	84 (21)	9 (15)	43 (22)	33 (23)
• M.A / MSc	296 (74)	48 (80)	139 (71)	108 (75)
• B.A / BSc	20 (5)	3 (5)	15 (8)	00
<b>Professional Qualification</b>				
• B.Ed.	156 (39)	22 (37)	76 (39)	59 (41)
• M.Ed.	240 (60)	37 (62)	121 (62)	82 (57)
Experience as school principal/administrator*	14±8 yrs.	13±8 yrs.	14±8 yrs.	13±9 yrs.
Experience working at this school*	6±5	7±6	6±5	6±4

\* mean ± SD

Table 1, presents a profile of schools included in this study and the demographic characteristics of respondents. Nearly half of the schools were girl schools, and a very few proportion of schools (2%) were for both girls and boys. The average number of students in these schools was  $715 \pm 493$  students and average staff strength of  $54 \pm 28$  persons. FGEI schools reported to have an average number of 21 classrooms, while PGR schools reported lesser number of classrooms. Only 41% schools reported having a health care facility within the school; 76.6% in FGEI schools followed by 43.8% in PGU and 21% in PGR schools.

Nearly 57% of the 400 respondents interviewed were females with a higher proportion (65%) of female staff in FGEI schools. More than half of the respondents were between 41 to 50 yrs. of age. Almost three fourth of the staff interviewed had a Master's level educational degree and almost all staff members had a professional degree in education.

**Table 2: Knowledge of Respondents and Public Sector Secondary School Preparedness and Practices Against Covid-19 Epidemic, Pakistan 2020**

Variables	Total N (%)	FGEI N (%)	PGU N (%)	PGR N (%)
<b>Knowledge</b>				
• Covid-19 is a conspiracy	10 (2.5)	5 (8.3)	5 (2.6)	00 (00)
• Covid-19 is an epidemic	186 (46.5)	45 (75)	92 (46.5)	49 (34)
• Covid-19 can be controlled	70 (17.5)	14 (23)	51 (26)	5 (3.5)
• Covid-19 is a viral disease	319 (80)	38 (63)	163 (83)	118 (81)
• How to limit the spread of COVID-19				
○ <i>Washing hands</i>	387 (96)	50 (83)	192 (98)	141 (98)
○ <i>Wearing masks</i>	394 (98)	60 (100)	191 (97)	143 (99)
○ <i>Disinfecting spaces</i>	188 (47)	47 (78)	97 (49)	44 (31)
○ <i>Not shaking hands</i>	123 (30)	22 (37)	75 (38)	26 (18)
○ <i>Standing at least 2-6 ft. distance apart</i>	268 (66)	45 (75)	128 (64)	94 (64)
<b>Preparedness</b>				
• School has shared Safe School Preparedness (SSP) policy with Students?	291(73)	56 (93)	141 (72)	94 (65)
• School has established a Health Safety Committee	275(69)	46 (77)	143 (73)	86 (60)
• School has appointed a focal person for school preparedness during Covid-19 epidemic?	339 (85)	46 (77)	160 (82)	133 (92)
• Provision of items by school				
○ <i>Sanitizers for teachers</i>	376 (94)	53 (88)	181 (92)	142 (99)
○ <i>Sanitizers for students</i>	378 (94)	54 (90)	182 (91)	142 (99)

○ <i>Face Masks for teachers</i>	285 (71)	53 (88)	156 (78)	76 (53)
○ <i>Face Masks for students</i>	275 (69)	45 (75)	152 (78)	78 (54)
○ <i>Soap for hand washing</i>	253 (88)	56 (93)	170 (87)	126 (88)
● Safe distance maintained in classroom seating arrangements	377 (94)	58 (96)	181 (92)	138 (96)
● School follows staggered approach for class of more than 20 students	387 (96)	59 (98)	183 (93)	141 (98)
● School has displayed sign posts with COVID-19 information	389 (97)	57 (97)	189 (96)	142 (99)
● Availability of thermometer in school	58 (14)	16 (27)	32 (16)	10 (7)
● School has allocated room to isolate individuals with Covid-19 symptoms	184 (46)	36 (60)	102 (52)	46 (32)
● School has established Hand washing stations	374 (93)	54 (90)	186 (95)	134 (93)
● School building is regularly disinfected	382 (95)	60 (100)	186 (95)	136 (94)
● School has been provided funding to meet expenses for Covid-19	49 (12)	29 (48)	17 (9)	3 (2.1)
<b>Practices (through Observations)</b>				
● Everyone wearing face masks	227 (57)	50 (83)	124 (61)	56 (39)
● Regularly washing hands using hand washing protocol	222 (55)	46 (77)	124 (61)	52 (36)
● Everyone avoids shaking of hand and maintains safe distance	29 (7)	11 (18)	16 (8)	2 (1.4)
● Maintained social distancing in				
○ <i>Classroom</i>	386 (97)	59 (98)	193 (98)	133 (93)
○ <i>Library</i>	96 (24)	28 (47)	52 (26)	16 (11)
○ <i>Laboratory</i>	84 (17.3)	31 (52)	37 (19)	0 (0)
○ <i>Cafeteria</i>	31 (8.2)	14 (23)	15 (8)	2 (1.4)
○ <i>Staffroom</i>	146 (36)	44 (73)	85 (43)	18 (13)
○ <i>Washrooms</i>	98 (24)	29 (48)	67 (34)	2 (1.4)
○ <i>At School Exit</i>	289 (72.1)	53 (88)	142 (73)	94 (65)
○ <i>In Parking lot</i>	45 (11.2)	20 (33)	25 (13)	0% (0)
● School has prominently display health care signs of COVID-19	356 (89.1)	48 (80)	172 (86)	136 (94)

The knowledge of respondents, the preparedness of each school and COVID-19 related practices are shown in Table 2. Our analysis shows that most respondents knew of COVID-19 epidemic only 8.3% considered it a conspiracy. Respondents were fairly knowledgeable about the transmission modes of COVID-19, i.e. washing hands, wearing mask and maintaining a safe distance from each other. However, it is important to note that only 17.5% believed that COVID-19 could be controlled through public health measures. Overall, better knowledge for all variables was found among FGEI schools in comparison to schools administered through Punjab Government.

Various preparedness measures adopted by school administration to make the school environment safe for COVID-19 were investigated. These included displays of sign posts/poster etc., with COVID-19 information (97%), disinfecting school building (95%), established hand washing stations (93%), focal person assigned for COVID-19 (85%), Safe School Preparedness policy shared with students (73%) and establishment of a health safety committee in 69% schools. Similarly, large proportion of schools had necessary items such as hand sanitizers, facemasks and soaps for hand washing. It was interesting to note that more disease-specific preparedness such as room allocation to isolate suspected COVID-19 cases was established in 46% schools and only 14% of schools had thermometers to check student's temperature. Only 12% schools reported that they have been provided funding to meet COVID-19 related expenses. Further analysis showed that funding was available in 48% schools in FGEI, 9% and 2% in PGU PGR schools respectively.

While we have seen a reasonable knowledge among school staff and a fair level of school preparedness, our analysis of practices shows a mixed pattern. Although FGEI schools showed safer practices in comparison to PGU and PGR schools, all of the schools fell short of the standard operating protocols suggested to control the spread of COVID-19. Nearly half of the school teachers and students were not wearing face masks and the practice of hand washing was also not followed by everyone. Maintaining a safe social distance was found to be high across all type of schools in classrooms (97%) and school exit (72%), areas like cafeteria (8%) and parking lots (11%) showed a significantly low practice of maintaining social distancing.

**Figure 1: Mean scores on COVID 19 related Knowledge, Preparedness and Practices by type of schools, Rawalpindi, Pakistan 2020.**

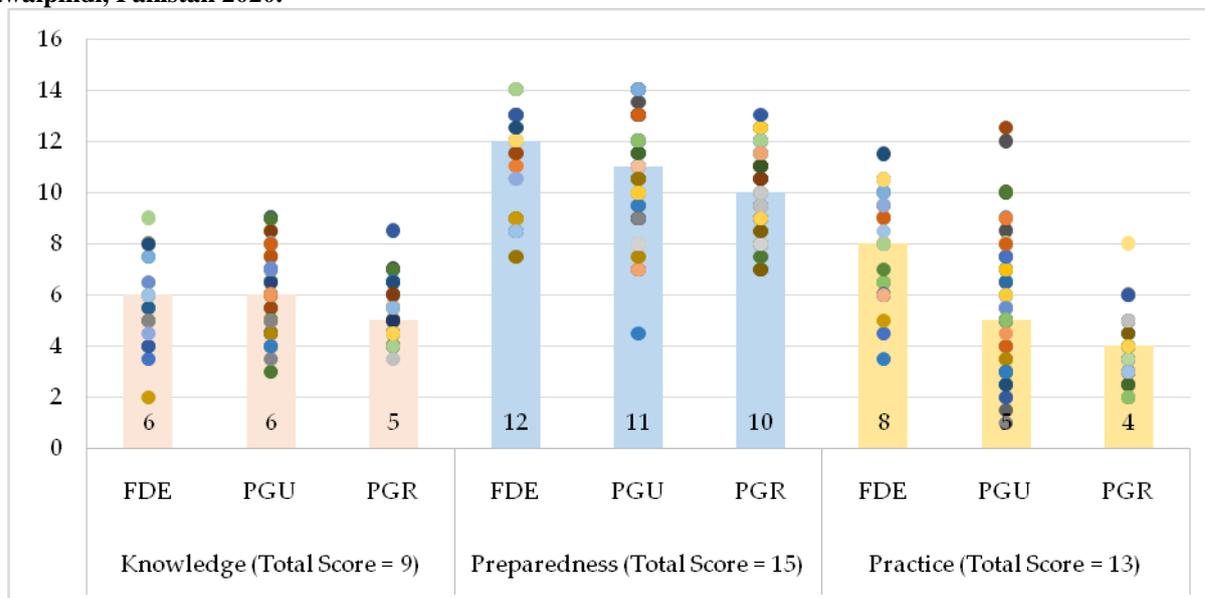


Figure 1 shows the total means score of knowledge, preparedness and practice across all types of schools and the distribution of each individual school across these three domains. Each domain i.e., knowledge, preparedness and practices had a total score of 9, 15 and 13 respectively. Analysis of Variance (ANOVA) showed significant differences among schools across each domain of., knowledge ( $p$  value  $< 0.05$ ), preparedness ( $p$  value  $< 0.05$ ) and practices ( $p$  value  $< 0.01$ ). Heterogeneity of responses across all domains was also seen within each school category as well, shown by scattering of dots within each bar, which represents the mean score. Across all domains, FGEI schools had better mean scores in comparison to PGU and PGR schools across different domains.

#### 4. Discussion

As the COVID-19 pandemic progresses, more evidence is suggestive that children are less likely to spread COVID-19 [xx]. In light of this evidence, more and more countries including Pakistan are planning a phase wise opening of schools [xxi]. This reiterates the need of putting in place safety measures in a way to ensure protection of children and school staff from the disease, and limit the spread of the virus within school environment [9,15,xxii]. To our knowledge this is the first research conducted in the Pakistan education system, to understand the COVID-19 related situation within schools. The study thus fills an acutely felt knowledge gap, through an assessment of COVID-19 related knowledge among school staff, appraises the safety measures practiced within schools and gauges the preparedness of schools to cope with this challenging situation.

It is alarming to note that most schools are either not prepared, or are underprepared to ensure a safe environment for both teachers and students. While we do not have any data available from Pakistan on school preparedness, broader assessment in South Asian countries highlighted a poor pandemic preparedness in general [xxiii]. Our results show that the overall knowledge of school staff about COVID-19 is piecemeal and fragmented, which results in large knowledge gaps and a lack of understanding of the disease. Thus, while most school administrators knew that COVID-19 is a highly transmissible viral disease and also knew of its transmission modes, the knowledge of how it can be effectively controlled was poor. More importantly, a very small proportion of respondents trusted, that COVID-19 could be controlled through effective public health measures. This has a profound effect on the practices of both the staff and school children, which is key to limit the spread. This lack of confidence in precautionary measures could be related to a high level of COVID-19 related disinformation communicated through social media, [xxiv] which has shown to be one of the barriers to develop a science-based understanding of the epidemic and a trust in the effectivity of safe practices [xxv].

The study has also found varying degrees of correlation between knowledge and practices, and an adherence to safety protocols. We noticed wide gaps between knowledge and practices regarding the use of facemasks, hand hygiene, and physical touching/shaking of hands to avoid COVID-19. While a very high proportion of respondents knew the importance of these precautionary measures, the practices were not found to correlate with knowledge. This is consistent with similar research on COVID-19 related knowledge, attitudes and practices, which suggests that higher knowledge does not ensure adherence to safe practices and ensure healthy behaviors [xxvi]. It was interesting to note that places that are continuously monitored by supervisory staff such as classroom, school gate etc. have maintained safety protocols, while less supervised spots such as library, laboratory, cafeteria, washrooms and parking lots etc., were mostly non adherent to safety protocols. Our study has also shown significant differences between Federal Government Cantt Garrison schools and schools functioning under supervision of Punjab Education department. In comparison to Federal institutions, schools functioning under the provincial department especially those in the rural and semi-urban communities lacked the required resources and capacity to deal with a crisis like that of COVID-19. Even within the same school system, we have noticed differences between various schools. It also hints to the seriousness of the response between the federal and provincial administrative system, which is already seen in Pakistan [xxvii].

Suitable preparedness does not only involve development of guidelines and tools, but a systematic mechanism of how these tools are made available to the end user to ensure effective action. The Ministry of Federal Education and Professional Training, Government of Pakistan (2020) formulated Pakistan National Education Response and Resilience Plan (K-12) for COVID-19 to reopen the schools and ensure safety of the teachers and students. Our results reveal that the 'Safe School Preparedness Policy' was not available to more than one-third of the schools, which indicates that a significant number of secondary schools are working without any specific guidelines. Moreover, only a mere one-tenth of schools were provided funding from the public exchequer to deal with COVID-19 epidemic. Thus, a majority of schools were self-supporting the additional COVID-19 related expenses. Because of this lack of funding, protective items such as facemasks, hand-sanitizers, soap etc., were not found to be available in all schools. Additionally, we were unable to find a coping mechanism to tackle any health emergency situations with nearly one-third of the schools not even formulated a Health Safety committee.

#### **Limitations**

A few limitations of the study need mention. Our research is limited to public health schools in only one of the districts and the extrapolation of the findings to private sector schools and schools in the other parts of the country should be made with caution. Our analyses are descriptive in nature and do not establish any causal evidence. Moreover, this study cannot account for unmeasured factors, such as COVID-19 situation in a community, and availability of resources, both of which could be related COVID-19 awareness and preparedness. Despite these limitations, the study has identified crucial gaps in knowledge and preparedness of schools to deal with the pandemic, and the results of the study can be used to improve the safety.

#### **5. Conclusions**

As the education system in Pakistan is beginning to resume in-person classes, it is extremely important that schools take on every public health instruction in an efficient manner. The results of our study suggest that schools are not well equipped to confront COVID-19 and the level of preparedness is inadequate to ensure a safe reopening of schools. While there are safety guidelines and standard operational protocols have been developed, a systematic mechanism of how these tools are implemented at the level of a school is not available. There is wide variability in the knowledge and awareness of staff including principals and administrators, which might not prove enough to ensure effective action for a safe re-opening of schools. Multiple measures such as communication, collaboration, self-screening, enhanced personal hygiene, enhanced cleaning protocols, physical distancing, appropriate use of masks and outbreak management are paramount in keeping students and staff safe, healthy and in schools throughout the pandemic.

With more and more schools planning to re-open, this research will help inform and support the planners and decision makers in educational systems to strengthen pandemic response plans and its implementation. As schools are expected to strictly follow Public health guidance, it is important to note that the current level of awareness regarding COVID-19 is low and the skills required to do so are not up to the standard. To overcome these gaps, school staff including teachers and administrative staff should be provided training on these guidelines. A monitoring mechanism should be developed to support the implementation of safety guidelines. Funds should be made available to schools to ensure a supply of items such as face masks, sanitizers, disinfectants etc., In the wake of the pandemic, it is collective joint responsibility of the education system and the public health system to make school environments safe and secure for children as well as the staff and community. Schools need to adhere to safety protocols and the public health authorities need to provide updated guidance on the pandemic. Thus, a close coordination between the education system and public health professionals is required to keep pace with the changing situation of COVID-19 in the country. Further both systems should work closely to monitor and evaluate the implementation approaches, and generate robust

evidence base to modify the response as needed, to ensure the safety of school staff, children and the community.

**Supplementary Materials:** The material will be provided if required

**Author Contributions:** Malik Ghulam Behlol (MGB) led the overall research processes and monitored field data collection. Salma Nazar Khan(SNK) has provided inputs in the conceptual design of the study and wrote the first draft. Saadia Panni (SP) has provided inputs in writing and the survey development section. Faiza Masood(FM) supervised field data collection and provided input in the analysis. Tahira Ezra Reza (TER) provided inputs in the conceptual design of the study and supervised analysis. Fazal-ur-Rehman (FR) conducted parts of the analysis and provided input in the results. Saima Hamid (SH) has provided inputs in the design and draft of the study. Sobia Khateeb (SK) helped in writing sections of the first draft of the paper. Faran Emmanuel (FE) helped in conceptualizing the study, supervised the overall research process and edited the final draft. All authors have read and approved the manuscript.

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**Institutional Review Board Statement:** The researchers obtained administrative approvals from the relevant authorities of FGEI & Punjab Education and Fatima Jinnah University Rawalpindi Ethical Review Board reviewed and approved this research (ERB application No: FJWU/EC/2020/20)

**Informed Consent Statement:** Informed consent was obtained from all participants involved in the study.

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**Conflicts of Interest:** The authors declare no conflict of interest and the funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

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