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# Investigating the Impact of COVID-19 on the Morale of Deaf and Hearing-Impaired Students in Saudi Arabia Technical Colleges: Lessons Learned and Future Implications

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## **Investigating the Impact of COVID-19 on the Morale of Deaf and Hearing-Impaired Students in Saudi Arabia Technical Colleges: Lessons Learned and Future Implications**

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### **ABSTRACT**

Literature studies indicate that student morale has been affected during the Covid-19 pandemic. The COVID-19 pandemic has affected the mental health of people worldwide, and hard-of-hearing students may be particularly vulnerable. Researchers have well explained the relationship between stress, depression and anxiety between university students and COVID-19 pandemic. Indeed, many students had to follow their theoretical and practical courses remotely, using many programs and technologies, something that was not planned before. In addition, the containment measures applied by several countries during this period disrupted the school calendar and the normal course of university studies. Staying home for a long time period was not easy and caused students to ask many questions about their future studies. Most of the thoughts were negative, resulting in pessimistic feelings. This cross-sectional study aimed to determine the prevalence of depression, anxiety, and stress among hard-of-hearing students during the COVID-19 pandemic. In this work, we attempted to answer some questions by studying the application of two different tests to understand closely the impact of the COVID-19 pandemic on the moral status of deaf technical students in Saudi Arabia colleges. The goal is to extract the necessary lessons, tips and information that will protect this type of students in the future. Depression was slightly higher than anxiety and stress levels. The prevalence of depression was 56.2% for severe levels, while anxiety and stress levels had relatively lower severe cases of 45.2% and 49.3%, respectively. The study highlights the need to pay attention to the mental health of hard-of-hearing students during the COVID-19 pandemic and to provide appropriate support to manage their mental health.

**Keywords:** COVID-19, Anxiety, Depression, Stress, deaf and hard of hearing students

### **1. INTRODUCTION**

Deaf-mute students are considered the most vulnerable part of society because their physical disability makes them unable to fully integrate into society. In general, this category of students is considered to be the most exposed to difficulties of courses understanding and training. These difficulties have increased during the Corona pandemic, as several countries have taken protective measures and strict health protocols to avoid the consequences of the pandemic. Many countries have forced their citizens to stay at home for a long time; this has affected the moral state of students, including those who are deaf and dumb. To follow their study, establishments have resorted to remote study methods. Unfortunately, distance learning tools for deaf-mute students were not sufficient, audio-visual communications were not effective.

This work aims to determine and investigate mental health issues for deaf and hard of hearing students during the covid-19 pandemic. The study is carried out only for students belonging to technical universities in Saudi Arabia. Technical studies differ from that of universities studies since the majority of the modules have a practical aspect and therefore a lot of distance learning difficulties. This study can serve as a guide to sensitize the World Committee in order to establish common and effective strategies for this type of student.

## 2. Related Works

The COVID-19 pandemic has had a significant impact on populations worldwide (Kessler et al., 2007; Kovess-Masfety et al., 2016; Verger et al., 2009; Verger et al., 2010; Arsandaux et al., 2020), including those who are deaf or hard of hearing. In a recent study, Swanwick et al. (2021) investigated the impact of the COVID-19 pandemic on deaf adults, children, and their families in Ghana. The study used a mixed-methods approach, combining a quantitative survey with qualitative interviews. The survey included questions about access to information, education, and health services, while the interviews explored experiences and perspectives on the impact of the pandemic.

The results of the study indicated that the COVID-19 pandemic has had a significant impact on the lives of deaf individuals and their families in Ghana. Participants reported a lack of access to information about the pandemic, with many relying on social media and other informal sources for information. This lack of access to reliable information led to confusion and anxiety among participants.

The study also found that the pandemic had disrupted education for deaf children, with many unable to access online learning platforms or receive support from teachers. This disruption to education had a significant impact on the mental health and well-being of both deaf children and their families.

In terms of healthcare, participants reported difficulties accessing healthcare services due to communication barriers and the closure of healthcare facilities. This lack of access to healthcare services had significant implications for the health and well-being of deaf individuals and their families.

The qualitative interviews provided additional insights into the impact of the pandemic. Participants reported feelings of isolation, anxiety, and depression as a result of the pandemic, with many struggling to cope with the sudden changes brought about by the pandemic.

Overall, the study highlights the need for increased support and resources for deaf individuals and their families in Ghana during the COVID-19 pandemic. This includes improving access to information, education, and healthcare services, as well as providing mental health support to those struggling with the impact of the pandemic.

The COVID-19 pandemic has necessitated a rapid shift towards remote teaching and learning worldwide (Malhi et al 2022), (Mazza, M. G et al 2020) and (Mulla, M. et al 2022). However, remote teaching has posed unique challenges for deaf pupils due to communication barriers and the need for visual information. This literature review explores some studies that investigate the impact of remote teaching on deaf students during the COVID-19 pandemic.

In the first study, Baroni (2020) explores the challenges of remote teaching for deaf pupils in Italy. The study found that remote teaching posed significant challenges for both deaf pupils and their teachers. Deaf pupils reported difficulties in accessing remote teaching due to the lack of accessible technology and communication barriers, leading to a significant impact on their educational progress. Teachers also reported challenges in adapting to remote teaching, particularly in ensuring that teaching materials were accessible to deaf pupils.

In the second study, Mabruroh (2021) investigates the implementation of remote learning for deaf students in Indonesia. The study found that while remote learning had the potential to increase access to education for deaf students, it also posed challenges in terms of providing visual information and ensuring effective communication. The study highlights the need for increased support for deaf students during remote learning, including the provision of accessible technology and resources.

Both studies suggest that the COVID-19 pandemic has had a significant impact on the education of deaf pupils, highlighting the need for increased support and resources for deaf pupils during remote teaching. These resources include accessible technology and communication support for deaf pupils, as well as training and support for teachers in adapting to remote teaching for deaf students.

Overall, the studies demonstrate that the COVID-19 pandemic has brought to light the need for increased awareness and support for deaf pupils in remote teaching and learning contexts, highlighting the importance of inclusive education practices for all students, including those with disabilities.

The COVID-19 pandemic has posed numerous challenges for e-learning, particularly for students who are deaf or hard of hearing. In his study, Jadir (2021) investigates the challenges of e-learning for deaf students in Morocco during the COVID-19 pandemic.

The study uses a qualitative approach, collecting data through semi-structured interviews with ten deaf students and two educators. The study found that deaf students faced numerous challenges in accessing e-learning resources, including the lack of accessible technology, limited access to sign language interpreters, and the absence of captions or transcripts for audio content. These challenges led to difficulties in understanding and engaging with course material, which had a significant impact on the academic progress of deaf students.

The study also found that the sudden shift to e-learning during the pandemic had a negative impact on the mental health and well-being of deaf students. Participants reported feelings of isolation, frustration, and anxiety due to the lack of communication and support during e-learning. The study highlights the need for increased support for deaf students during e-learning, including the provision of accessible technology, sign language interpreters, and captioning or transcripts for audio content.

Overall, the study demonstrates the significant challenges faced by deaf students during e-learning and the need for increased awareness and support for inclusive education practices for all students, including those with disabilities. The findings of the study are particularly relevant for policymakers and educators in developing countries, where access to technology and resources may be limited for students with disabilities. The study highlights the importance of prioritizing accessibility and inclusivity in e-learning during the COVID-19 pandemic and beyond.

Adigun (2021), in his study, investigates the experiences of natural-science teachers in South Africa who have had to handle deaf/hard-of-hearing learners via Zoom during emergency remote teaching.

The study uses a qualitative approach, collecting data through semi-structured interviews with seven natural-science teachers who have experience teaching deaf/hard-of-hearing learners via Zoom. The study found that teachers faced significant challenges in adapting to remote teaching, particularly in terms of ensuring effective communication and providing visual information. The study also found that the lack of accessible technology and resources posed additional challenges for teachers and students alike.

Despite the challenges, the study also highlights the positive experiences of teachers who were able to adapt to remote teaching and provide effective support for their deaf/hard-of-hearing learners. The study highlights the importance of teacher training and support in adapting to emergency remote teaching and ensuring that all learners are able to access education effectively.

Overall, the study demonstrates the significant challenges faced by natural-science teachers in South Africa in handling deaf/hard-of-hearing learners during emergency remote teaching via Zoom. The study highlights the need for increased support and resources for teachers and learners alike, including accessible technology, training and support for teachers, and communication support for learners. The findings of the study are particularly relevant for developing countries, where access to technology and resources may be limited for students with disabilities and underscore the importance of inclusive education practices for all learners.

Aljedaani (2021) examines the emerging challenges of online learning for deaf and hearing-impaired students during the COVID-19 pandemic. The study uses a systematic review approach, examining existing literature on the experiences of deaf and hearing-impaired students during online learning. The study found that online learning poses numerous challenges for deaf and hearing-impaired students, including the lack of accessibility features such as closed captioning and sign language interpretation, the difficulty of lip-reading through video conferencing, and the challenges of asynchronous learning. The study also highlights the unique challenges faced by deaf and hearing-impaired students in social interaction and peer communication during online learning. The lack of face-to-face interaction and the limited availability of sign language interpreters and captioning services can lead to social isolation and reduced engagement in learning activities.

The study concludes by highlighting the need for increased awareness and support for inclusive education practices during online learning for deaf and hearing-impaired students. The study recommends the provision of accessible technology and resources, such as closed captioning and sign language interpretation, as well as increased training and support for educators and students alike.

Overall, the study underscores the challenges faced by deaf and hearing-impaired students during online learning and highlights the need for increased support and resources to ensure that these students are not left behind. The findings of the study are particularly relevant for policymakers and educators in developing countries, where access to technology and resources may be limited for students with disabilities and underscore the importance of inclusive education practices for all learners.

In her study, Tomasuolo (2020) examines the impact of the COVID-19 pandemic on the Italian deaf community. The study uses a qualitative approach, collecting data through online surveys and interviews with members of the Italian deaf community.

The study found that the COVID-19 pandemic has had a significant impact on the Italian deaf community, particularly in terms of communication access. The lack of accessible information and the closure of sign language interpreting services have led to significant barriers in communication, resulting in increased social isolation and reduced access to healthcare services.

The study also highlights the challenges faced by the Italian deaf community in adapting to remote communication technologies during the pandemic. While video conferencing technologies such as Zoom have provided a means for remote communication, they have also posed unique challenges for deaf individuals, particularly in terms of providing effective sign language interpreting and ensuring effective communication access.

The study concludes by highlighting the need for increased support and resources for the Italian deaf community during the pandemic. The study recommends the provision of accessible information and communication services, as well as increased training and support for sign language interpreters and educators to ensure effective communication access.

Overall, the study provides important insights into the challenges faced by the Italian deaf community during the COVID-19 pandemic and underscores the importance of inclusive and accessible communication practices. The findings of the study are relevant not only for the Italian deaf community but also for deaf communities globally, emphasizing the need for increased support and resources for deaf individuals during times of crisis.

### 3. Hearing impaired and deaf students

#### 3.1 In the world

For deaf students, it is difficult to go to university because their hearing loss interferes with communication with others. In general, students must follow their course by taking notes, follow and understand at the same time and above all ask questions and interact with the teacher. Deaf students unfortunately cannot do all of this. For these reasons, the university is difficult to access. It is a complete university infrastructure that must be made available to these students to make the university accessible. By dint of excessive concentration, frustration due to incomprehension or prejudice, the deaf or hard of hearing student can end up being discouraged, associating his studies with an anxiety-provoking malaise, seeing his results drop and entering the spiral of dropping out.

According to the World health organization (World health organization), by 2050 nearly 2.5 billion people are projected to have some degree of hearing loss and at least 700 million will require hearing rehabilitation.

The word federation (Word Federation of the Deaf) of the deaf try to collect donates to help deaf people. It plans congress and events to explore the last research and proposed solutions.

#### 3.2 In Saudi Arabia

The percentage of persons with disabilities in the Kingdom is estimated at about 7-10 percent of the population, according to the latest statistics issued by The Department of Statistics: (27136977). From the Saudi Authority for Persons with Disabilities APD: Persons with disabilities constitute 7.1 person of the Kingdom s total population. According to the Statistics Authority, the number of persons with disabilities is as follows:

- Hearing impairment: .289355
- ADHD: 30.155.0000
- Mobility disability: 833.136.0000.0000
- Autism Spectrum Disorder: .3,282
- Down syndrome: 19,428
- Visual impairment: 811,610

### 4. Study Variables and Measurements

To collect Participants socio-demographic information, we applied a questionnaire to collect the levels of age, gender, presence of family, support of friends, level of education, etc.

To measure the level of depression, stress and anxiety, the famous DASS test was used. The Arabic version of the DASS approved by (Al Omari et al., 2020) and translated into sign language by professional translators was used.

The DASS assessment standard (a 21-point Likert scale) was also applied. Indeed, the abbreviated form of the DASS is 4 points: where 0 = does not apply to me at all; 1 = applies to me to some extent, or some of the time; 2 = applies to me to a great extent, or a good part of my life; and 3 = applies to me a lot, or most of the time.

### 5. Statistics

In this work, 73 participants answered the questions directly. Indeed, the translator asks and explains in sign language questions one by one. The two questionnaires applied are DASS and MFT (Denden and Alkhalifah (2023)), the first one is used to determine the level of depression, stress, and anxiety and the second to determine causes that have increased or decreased these levels during the covid-19period (Figure 1).

After gathering information, we applied statistical methods like SD standard deviations, Pearson's correlation coefficient and means. This allowed us to identify the results shown below.

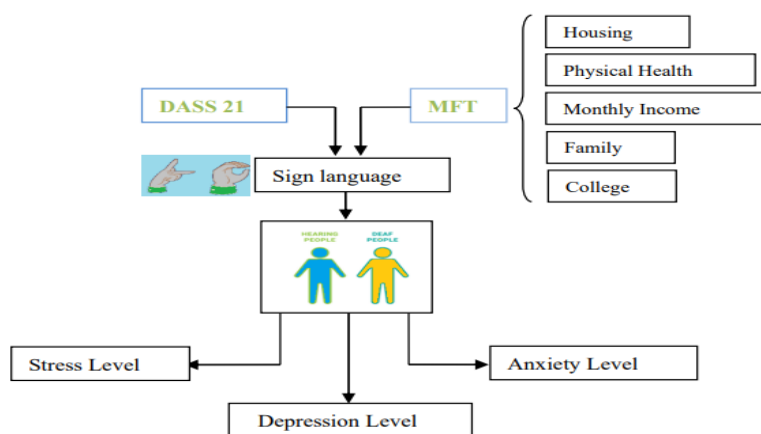


Figure 1: Proposed questionnaire Model



## 6. RESULTS AND DISCUSSION

### 6.1 Population

In “Table 1” participants are grouped according to their age. The mean age of the CTI students is 21 years with a student minimum age of 19 and the maximum age of 27 years, all of them suffer from hard hearing problems. The total number of participating students was 73 (all of them are male because no female students in CTI College).

**Table 1. Socio-demographic factors among participants**

Characteristics	Number	Percentage
Age group (Mean± Std Deviation )		52.8%
18-20	9	12.5%
21-23	22	30.6%
24-26	22	30.6%
>26	19	26.4%

### 6.2 Prevalence: DASS Test

Results of the statistical analysis are grouped in “Table 2”. The table shows the mean and variance score of depression, anxiety, and stress. The Depression level was slightly higher than anxiety and stress (Mean 2.83, SD 1.4 vs. Mean 2.67, SD 1.37 and Mean 2.71, SD 1.39 ).

**Table 2. DASS prevalence and scores**

	DEPRESSION LEVEL	ANXIETY LEVEL	STRESS LEVEL
Valid	73	73	73
Missing	0	0	0
Mean	2.83	2.65	2.71
Variance	1.96	1.89	1.95
Minimum	Normal	Normal	Normal
Maximum	Severe	Severe	Severe

#### 6.2.1 Prevalence of depression

“Table 3” shows depression level, statistic results show two peak points for normal and severe case, intermediates values (mild, moderate) are not important. The normal level is 34.2 %, the severe level is 56.2 % and just 9.5 % for mild and moderate levels. These values are slowly becoming high compared to the international results.

**Table 3. Prevalence of depression**

Depression Level				
	Frequency	Percent	Valid Percent	Cumulative Percent
Normal	25	34.2%	34.2%	34.2%
Mild	2	2.7%	2.7%	37%
Moderate	2	6.8%	6.8%	34.8%
Severe	5	56.2%	56.2%	100%
Total	73	100.0	100.0	

#### 6.2.2 Prevalence of anxiety

“Table 4” shows the level of anxiety (37.0 % for normal, 4.1% for mild, 13.7% for moderate, 45.2 for severe and 0 % for extremely severe). Comparing to depression level the Anxiety percentages are relatively less.

**Table 4. Prevalence of anxiety**

Anxiety Level				
	Frequency	Percent	Valid Percent	Cumulative Percent
Normal	27	37.0%	37.0%	37.0%
Mild	3	4.1%	4.1%	41.1%
Moderate	10	13.7%	13.7%	54.8%
Severe	33	45.2%	45.2%	100%
Total	73	100.0	100.0	

### 6.2.3 Prevalence of stress

In “Table 5”, the prevalence of stress is showed. It shows a percentage of stress equal to 37% for normal, 2.7% for mild, 11% for moderate, 49.3% for severe and no values for extremely severe). The percentage of the Stress is also less than depression level.

**Table 5. Prevalence of stress**

Stress Level				
	Frequency	Percent	Valid Percent	Cumulative Percent
Normal	27	37%	37%	37%
Mild	2	2.7%	2.7%	39.7%
Moderate	8	11%	11%	5.7%
Severe	36	49.3%	49.3%	100%
Total	152	100.0		

Summarizing, depression, anxiety and stress percentage are considered high compared to normal university students, for example in the work of ( feres et al 2020) Frensh students shows 35% for depression. In the next paragraph, the MFT survey was applied to establish the relationship between not only Covid-19 but also, social, economic and social conditions for this student category.

### 6.3. MFT Test

The MFT test consists of determining the causes, other than Covid-19, which helped deaf students or, on the contrary, increased the levels of stress, depression and anxiety. This test is based on the work carried out by (Kessler et al 2006) and (feres et al 2020) in the first time and (DENDEN at al 2023) in the second time.

As shown in Figure 1, the subject of the questions asked of students relates to the family, financial and student situation.

#### 6.3 -1College environment

- **Interaction with teachers:**

During the covid-19 period, the majority of citizens were forced to wear masks to avoid the retransmission of corona viruses. The loan of the mask was not a comfort for the deaf pupils and their teachers. The mask was a barrier to communication; it prevented deaf students from seeing the mouth signs of their teachers. The MFT asks students about this point. The teachers’ mask prevented 55.6% of deaf students from fully understanding lessons. 18.1% have moderate opinions and 26.4% say that the mask has no effect on understanding the lessons.

- **Teaching modules and exams**

Technical and vocational training is based on teaching students’ technical modules, the presence in laboratory is vital. During the Covid-19 period, deaf students were obliged to go to their colleges to follow their studies. The sophisticated e-learning software was not provided. Results showed that only 51.4 % of courses were available and recorded. The practical exam in the college was an obligation.

#### 6.3 -2 Social environment

- **Family support :**

MFT test indicates a percentage of 91% of deaf students live with their family, 54.2 % of them have a quiet study place at home and 87% of trainees have kept the same accommodation.

- **Associative activities**

In addition, associative activities have considerably decreased. Results show 0% activities during the pandemic period.

## 7. CONCLUSION AND FUTURE WORKS

The study of this work provided an overview of psychological effects related to the spread of the epidemic among deaf and hearing impaired technical and vocational students in Saudi Arabia. The depression, anxiety, and stress DASS is translated in sign language and applied to these students. According to our bibliographic research, there has been no study involving this type of student before. Our study has the particularity to be applied on hearing impaired and deaf students which their university study is based on labs more than theory modules.

Educational technologies have developed well in recent years, but unfortunately, online learning for deaf-mute students is not applied too much. This is caused an additional degree of stress, depression, and anxiety.

As in other countries, the sign language for this type of students in Saudi Arabia is different from others in the world. Smart smart-phone apps and special websites should be further developed.

The effects of the epidemic could have been less intense if mobile applications and audiovisual communication techniques had been better developed.

The current work concerning the technical deaf and hard of hearing students is probably the first in Saudi universities to investigate common mental health problems with Saudi trainees' sector during the pandemic. Findings can be used to establish emergency plans for this category of trainees.

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