

Attitude of Medical Students towards Zoom Online Lectures

Katherine Martha Birt* and Shiby Stephens

Department of Anatomy, Cardiff University, Wales, United Kingdom

Abstract

Objective: The COVID-19 pandemic has highlighted the importance of health care professionals; therefore, the education of future Doctors is highly relevant. This year, as medical student lectures have been delivered via online platforms like Zoom, it is important to explore attitudes towards Zoom lectures, to establish their impact on student welfare and education. The attitudes were of 1st year medical students. The hypotheses were: medical students would be negative towards Zoom online lectures; the age of the student would impact the perception of Zoom online lectures; and females would be more positive towards Zoom online lectures compared to males.

Methods: 20 randomized statements regarding Zoom online lectures were devised (ten positive and ten negative) and then scored according to the Thurstone and Chave method. An online survey was designed in Google Forms and, following ethical approval, distributed amongst 1st year medical students. Responses from 52.5% of Cardiff University 1st year medical students were received, and mean scores were calculated. The Wilcoxon test evaluated significant differences between groups.

Results: Medical students had an overall positive attitude towards Zoom online lectures. There was no significant difference by gender ($p=0.8826$ $W=3257.5$). 20+ year old students had the most positive perception which was significantly more positive than 18 ($p=0.0002501$ $W=1625.5$) and 19-year-olds ($p=0.009936$ $W=1476.5$).

Conclusion: 1st year medical students showed a positive perception towards online Zoom online lectures. Gender had no effect; however, age played a significant role, with those aged 20+ having a more positive perception than 18- and 19-year-olds.

Keywords: Attitude • Medical students • Pandemic • COVID-19

Introduction

The COVID-19 pandemic has stressed the vital importance of medical professionals. The consequences of the virus can be life threatening and have presented vast challenges to the healthcare profession [1].

In the previous severe acute respiratory syndrome coronavirus (SARS-CoV-1) outbreak in 2003, reported levels of sleep deprivation, anxiety and depression in healthcare workers was 75.3% [2]. This alerts us to the potential impact on mental wellbeing of the COVID-19 pandemic and consequently the seriousness of the issue.

Consequently, the education of future healthcare professionals has never been more important. However, as a result of social distancing measures in person teaching has been prevented and replaced with online learning to curb the spread of the virus. Videoconferencing platforms such as Zoom have been used to present lectures, utilizing features such as online meetings and breakout rooms [3]. Due to the use of such technology, it was predicted that the age of university students would impact student perception on Zoom online lectures as those younger students may already have been exposed to online education in their last year of school at the beginning of the pandemic.

In a study conducted amongst United States medical students involved in clinical training, a large majority (74.7%) agreed disruption of their medical education had been caused by the pandemic, a large majority. Moreover,

84.1% of students reported that they had experienced some form of anxiety as a result of the pandemic[4]. Therefore, understanding attitudes of medical students towards Zoom online lectures is important due to the mental toll on students of the pandemic and, moving forward, to guide how disruption may be lessened in the future.

Medical students compared to other university students face the added challenge of requiring clinical experience and patient contact [5]. The COVID-19 pandemic has made it difficult for such experience to take place not only due to the enforced reduction in patient contact to lessen transmission of COVID-19 [6]. It is vital that medical students develop good communication skills to interact with patients; thereby this demonstrates the importance of understanding the attitudes of medical students toward remote learning, specifically towards Zoom online lectures.

In a study performed prior to the pandemic, 75% of Tasmanian medical students agreed their performance was enhanced via e-learning [7]. Consequently, medical education integrating e-learning in some way could be beneficial because of the advantage of increased flexibility both in terms of delivery time and the interaction between staff and students.

In Libya, a study was conducted amongst students from 13 medical schools to identify the experiences of medical students ($n=3348$) during the pandemic [1]. The majority of students (64.7%) did not agree that e-learning could be easily employed in Libya, moreover, when asked whether clinical aspects could be delivered via e-learning only 21.1% agreed (1). Consequently, this indicates the impact of the pandemic on the delivery of medical education and how medical students view said e-learning.

Thus, the hypothesis was made that medical students would have a negative perception towards Zoom online lectures. Factors contributing to this hypothesis were identified as: difficulties of access to internet and technology as a result of students' financial situation and the capability of lecturers to portray content effectively via online delivery [8].

*Address for Correspondence: Katherine Martha Birt, Department of Anatomy, Cardiff University, Wales, United Kingdom; Email: katiebirt1@gmail.com

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Objectives

This study's objectives were

- To evaluate the perception of medical students towards Zoom online lecture via an online questionnaire that was sent to 1st year Cardiff University medical students.
- To understand whether age and/or gender plays a significant role in the perception of medical students towards Zoom online lectures.
- To identify what statements about Zoom online lectures are agreed with by medical students.

Hypotheses

- Medical students have a negative perception towards Zoom online lectures
- Increasing age impacts the perception of medical students towards Zoom online lectures
- Females have a more positive perception towards Zoom online lectures compared to males.

Materials and Methods

Design

Twenty randomly assorted statements with differing degrees of favourability towards Zoom online lectures were written including ten positive and ten negative attitudes (Table 1). Eight judges of different age, gender and educational background were chosen to judge how positive or negative each statement was. The panel of judges was sent instructions describing the Thurstone and Chave method, where the scale 1-11 was implemented. Judges were asked to score each statement according to how favourable each statement, without opinion. The lower the score (1-5), the more favourable the statement was towards Zoom online lectures and the higher the score the less favourable the statement (7-11); the mid-point 6 meant the statement had a moderate attitude towards Zoom online lectures. The mean average was calculated from the scores given by the judges and used to indicate the favourability of the statement (Table 1). The panel was excluded from further participation in the research.

Questionnaire

The first page of the questionnaire consisted of an information and consent form, detailing contact details of the research leads. Background questions about the age, gender, level of education, degree title and Zoom online lecture experience were included in the questionnaire. Then participants were asked which statements they agree with. The questionnaire was conducted utilising 'Google Forms' to enable online distribution.

Ethical approval

The project was approved by the Research Ethics Committee of the Cardiff School of Biosciences and the reference number is 20 12-02.

Data collection

Following ethical approval, the questionnaire was distributed to Cardiff University first year medical students via university email addresses. The questionnaire was accessed via a link in the email.

Statistical analyses

Excel and R studio were utilised to analyse the data collated. Each questionnaire response was given an average score based on the mean panel score. The participants' responses were placed in groups according to gender and age. Further statistical analysis was performed using the Wilcoxon test with significance identified via a P value <0.05.

Results

The questionnaire was completed by 52.5% of Cardiff University first year medical students (n=166). The majority of students were female (n=102, 61.4%) and were aged 18-19 years (79.5%). The age range was between 18 and 27. When looking at the overall average score, calculated for all the participants across all statements, a positive perception of Zoom online lectures was indicated with a score of 4.56. However, the range of scores was between 1.50 and 5.95 indicating a variety of opinions towards Zoom online lectures, from extremely favourable to a more moderate view (Table 1).

Table 1. A table indicating the scored statements used in the questionnaire. The mean scores were calculated from the scores of the 8 judges.

Number	Statement	Mean panel score
1	Zoom lectures provide a better opportunity for questions to be asked to the lecturer through both the chat function and posing questions out loud.	3
2	A higher number of people can interact in zoom lectures with both the lecturer and their peers.	3
3	Zoom lectures do not cater for those without the required technology and WIFI.	9
4	There is no time or monetary cost associated with transport to Zoom lectures.	4
5	Certain content cannot be effectively portrayed via zoom lectures, such as hands on practicals like dissections.	8
6	Zoom lectures can make you feel more isolated.	10
7	Flexibility of timing is increased by utilising zoom lectures.	4
8	Zoom lectures require higher levels of self-motivation and self-discipline	6
9	Zoom lectures can be completed in any global location with WIFI.	2
10	It is more intimidating to ask a question in front of the entire zoom call, in conventional lectures, questions can be directed to one person.	9
11	It is easier for people to become disengaged and distracted in zoom lectures.	9
12	Utilising zoom lectures improves Information Technology skills of students needed in the workplace through the use of different technological platforms.	4
13	Zoom has the breakout room function which facilitates group work during or after zoom lectures.	5
14	Zoom lectures are more accessible to those that are physically or psychologically unable to attend in person lectures.	2
15	Those that live in overcrowded houses would struggle to find a suitable place to do zoom lectures that are quiet and not distracting.	10
16	Zoom lectures are more tiring as they require higher levels of concentration.	8
17	Online resources can be shared efficiently via zoom lectures.	4
18	Relationships between students and lecturers are more difficult to build in zoom lectures, without in person contact.	9
19	Learning via zoom lectures entails a lot of time spent behind a screen which can lead to physical ailments and health issues.	10
20	Comfort levels can be optimised whilst doing zoom lectures through being at home and tailoring the environment to best suit individual needs.	3

Significant difference between the scores of differently aged participants

Participants aged 20+ years (n=34) had the most favourable attitude towards Zoom online lectures (4.04) (Figure 1).

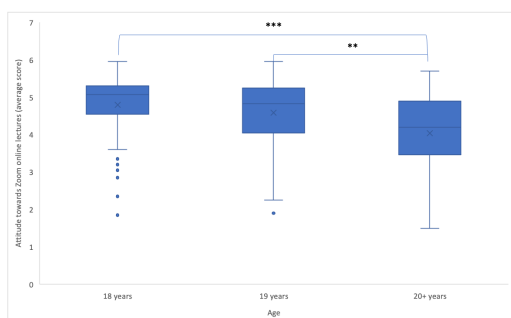


Figure 1. Perception of zoom online lectures of different aged participants. Note: Boxplots depicting the average scores of participants aged 18 years, 19 years and 20+ years towards zoom online lectures. x= mean. The length of the box is the interquartile range from the 25th to the 75th percentile. Black lines inside the box indicate the median values. ** =p<0.01 (significant result). *** =p<0.001 (significant result).

The Wilcoxon test was utilised to identify whether the differences between the age groups were significant. There was no statistical significance in the difference between the scores of 18-year-olds ((n=66), 4.80) and 19-year-olds ((n=66), 4.58) (w=2514.5, p=0.126) (Figure 1) (Tables 2 and 3). However, the highest level of significance was between participants aged 18 and those aged 20+ years (w=1625.5, p=0.000250) (Table 3). The difference between the average score of 19-year-olds and 20+ year olds was also significant (w=1476.5, p=0.00994) (Table 3).

Table 2. A table showing the average score of participants of different ages.

Age (years)	Average score
18	4.8
19	4.58
20+	4.04

Table 3. A table demonstrating the p values calculated to identify differences between the average scores of differing aged participants. The p values were calculated via the Wilcoxon test.

Age (years)	18	19	20+
18	-	0.126	0.00025
19	-	-	0.00994
20+	-	-	-

Whilst all age groups of medical students held a positive perception towards Zoom online lectures, however those aged 20+ years had a significantly more positive perception indicating the impact of age.

No significant difference between the average scores of males and females

Females (n=102) appeared to have a more favourable attitude towards Zoom online lectures, in comparison to males (n=63): 4.55 compared to 4.58 (Figure 2).

However, when considering significance in the difference between males and females, the Wilcoxon test was utilised and identified a lack of significance (w=3257.5, p=0.8826).

In summary, both males and female participants held more favourable attitudes towards Zoom online lectures and there was no significance in the difference between males and females (Figure 2).

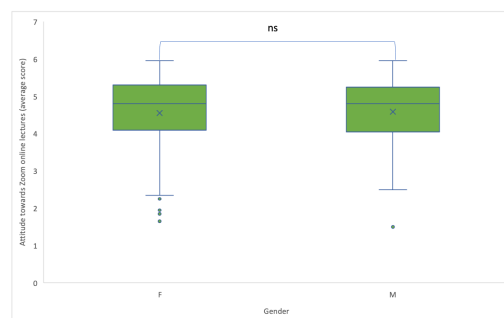


Figure 2. Perception of zoom online lectures of females and males. Note: Boxplots depicting the average scores of female and male participants towards Zoom online lectures. x=mean. The length of the box is the interquartile range from the 25th to the 75th percentile. Black lines inside the box indicate the median values ns=p>0.05 (no significance).

Majority of participants agreed with unfavourable statements

Although overall medical students held favourable attitudes towards Zoom online lectures (4.56), the statements around Zoom online lectures that had the highest percentage agreement, were unfavourable.

The statement with the highest percentage agreement (90.36%) was statement 5: “Certain content cannot be effectively portrayed via zoom lectures, such as hands on practicals like dissections” (n=150). This statement had a panel score of 8 indicating an unfavourable perception of Zoom online lectures. Furthermore, the statements with the next highest percentage agreement are also more negative towards Zoom online lectures: statement 18 (n=148) “Relationships between students and lecturers are more difficult to build in zoom lectures, without in person contact” and statement 11 (n=141) “It is easier for people to become disengaged and distracted in zoom lectures.” The respective percentage agreement of said statements was 89.16% and 84.94% and both had an average panel score of 9.

The percentage agreement of medical students with unfavourable statements identified by a score between 7 and 11 was 78.85% indicating the majority of medical students agreed with the statements that were more unfavourable towards Zoom online lectures.

The statement with the lowest percentage agreement (42.17%) was statement 12 “Utilising zoom lectures improve Information Technology skills of students needed in the workplace through the use of different technological platforms”. This statement scored 4 according to the Thurstone and Chave method, so it is apparent that not all favourable statements about Zoom online lectures judged favourable by the panel, are agreed with by medical students.

Although, medical students had an overall positive perception of Zoom online lectures, the majority of students agreed with statements indicating unfavourable attitudes towards Zoom online lectures.

Discussion

Overall, the results of this study indicate that medical students hold a more positive perception (4.56) towards Zoom online lectures, utilising the Thurstone and Chave scale. Furthermore, none of the medical students held an overall negative score given the range was between 1.50 and 5.95. Contrasting this, a study looking at the perceptions of private medical school students at Liaquat College of Medicine and dentistry, Pakistan, towards E-learning during COVID-19 found that 77.4% of students held negative perceptions towards E-learning [9]. Furthermore, in a different study identifying perceptions of United Kingdom medical students towards online learning during the COVID-19 pandemic, students were asked to score the statement “I prefer online teaching to face-to-face teaching” between 1 and

5 (1=strongly disagree and 5=strongly agree) [10]. The statement scored an average of 1.69, indicating that substitution of face-to-face learning with online learning is definitely not preferred by medical students. Therefore, it is possible that the positive perception obtained in this study may not be wholly representative of all medical students.

Interestingly, the results of this study indicated that the age of the medical student significantly impacted their perception of Zoom online lectures. Those aged 20+ years had a more positive perception of Zoom online lectures compared to those aged 18 years and those aged 19-year-old students. Consequently, this indicates a potential relationship between increasing age and a more positive perception towards Zoom online lectures. Furthermore, studies have suggested that with increasing age, levels of critical thinking and self-regulated learning increase leading to higher levels of success in online learning [11]. However, a study looking at the potential relationship between age of student and confidence using technology found no correlation thereby indicating that the identified link between age of student and Zoom online lectures may not be completely representative [12].

Gender did not impact the perception of medical students towards Zoom online lectures as indicated by a lack of significant difference ($p=0.8826$). The lack of impact of gender on perception of online learning has been commented upon in wider research, suggesting it is more the differing learning styles that influence perception of E-learning [13]. On the other hand, a study performed looking at year 2 medical students from James Cook University, Queensland; found that male students had higher satisfaction and self-efficacy in computer tasks than females, thereby demonstrating the potential impact of gender on perception of online education [14].

Medical students agreed with statement 5 "Certain content cannot be effectively portrayed *via* zoom lectures, such as hands on practicals like dissections" which could be explained by the inability to portray clinical content effectively. This is demonstrated by comments made in the feedback section: "I find it harder to engage with the content over Zoom" and "I believe practical's and anatomy sessions are much better taught and understood in person as online tools do not do them justice". However, in a study looking at United Kingdom medical students, the barrier most commonly associated with online teaching platforms was family distraction (26.76%) as opposed to content portrayal [10].

Hypotheses, proven or disproven?

The first hypothesis was medical students have a negative perception towards Zoom online lectures. This prediction was disproven given the average overall score was 4.56 indicating an overall positive perception.

Secondly, it was predicted that increasing age impacts the perception of medical students towards Zoom online lectures. This hypothesis was proved in this study due to the significant difference identified in those 20+ years compared to those aged 19 years and those aged 18 years. The impact on perception was that those aged 20+ years had a more positive perception (average score of 4.04) compared to those students younger in age. Consequently, increasing age positively impacts the perception of medical students towards Zoom online lectures.

Lastly, the third hypothesis was that female students have a more positive perception towards Zoom online lectures compared to males. This prediction was disproven, as the difference between males and females was not statistically significant thereby demonstrating the lack of impact of gender.

Conclusion

An overall positive perception towards Zoom online lectures was held by 1st year medical students. There was no significant difference between males and females indicating gender does not influence perception of Zoom online lectures. Those aged 20+ years held significantly more positive

perceptions of Zoom online lectures compared to 18- and 19-year-olds, therefore demonstrating the effect of age on perception of Zoom online lectures.

However, even though the overall perception is positive, the statement with the most agreement was negative and indicates the need for further research into the best way to utilise Zoom online lectures.

Limitations

A limitation of this study is that the participants were solely from one year group: year 1. Consequently, the perception may not represent all medical students due to those in older year groups having prior experiences of lectures not on Zoom. Additionally, the medical student who participated were solely from Cardiff University and therefore have only been exposed to education from one university which may not characterise the experience of all medical students.

As a result of the averages from the panel scoring of the statements, there were no statements with the Thurstone and Chave scores 1 and 11. This may have limited the scores of the participants and the subsequent perceptions analysed.

In the sample of students analysed, 62% were female students thereby indicating a large majority and potentially impacting the result of effect of gender on perception on Zoom online lectures.

Lastly, a potential limitation of this method is the use of panel scored statements does not automatically represent the perception of the participants: a participant may agree with a statement but not give it the same score as the panel. Consequently, the average scores of the medical students may not be entirely accurate.

Recommendations

Further research of a larger sample of medical students from different year groups needs to be conducted to obtain the overall attitude of medical students towards Zoom online lectures. This would enable a comparative study to be done between different year groups within the same university.

Moreover, comparative studies between different universities should be done to obtain an overall picture of medical students and their attitudes towards Zoom online lectures. Ideally further research should enable comparison to be made between year groups of different universities.

Lastly, a larger sample of students from the same year group should be utilised to identify how perception changes with age.

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N/A

Conflict of interest

There is no conflict of interest.

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