Teaching Competencies and Classroom Performance of University Teachers: Soft Skills as a Mediator

Amna Saleem, Zarina Akhtar
Ph.D. Scholar, Department of Teacher Education, International Islamic University Islamabad
Assistant Professor, Department of Teacher Education, International Islamic University Islamabad, Pakistan
*Corresponding author email: amna.phdedu159@iui.edu.pk

ABSTRACT
Soft skills are personal qualities that enable teachers to better engage with students. The purpose of the current study was to examine the role of soft skills as a mediator in the relationship between teaching competencies and classroom performance among university teachers. This study was quantitative and followed the positivist research paradigm. The researchers selected the study sample using multistage sampling. Two questionnaires and an observation sheet were used in this study. Researchers collected data from 132 public-sector university teachers in southern Punjab. SPSS and PROCESS macro were used to analyze the data. The data was analyzed using mediation analysis. The major conclusion of this study was that all the variables (teaching competencies, soft skills, and classroom performance) had a significant relationship, and soft skills also mediated between teaching competencies and classroom performance of university teachers. The major recommendation of the study is that future researchers include variables that may influence the performance of teachers in the classroom, such as job satisfaction, work discipline, motivation, and so forth, and also change the indicators for teaching competencies and soft skills.

KEYWORDS
Soft Skills, Teaching Competencies, Classroom performance

JOURNAL INFO
HISTORY: Received: January 28, 2023
Accepted: March 20, 2023
Published: March 26, 2023

1. INTRODUCTION
Teaching competencies are the skills and knowledge that help a teacher do well in the classroom (Albrahim, 2020). The competencies required of a teacher include skills such as communication and interpersonal skills, which include traits such as being a role model for their students, possessing clear verbal communication skills, taking responsibility, etc. (Tondeur et al., 2018). Teachers play an important role in the teaching-learning process (Starkey, 2020). Effective teachers present, implement, and evaluate classroom instruction according to the set objectives (Pit-ten Cate et al., 2018). The effectiveness of classroom instruction is highly dependent on the teacher's competency (Van Waeyenberg et al., 2022).

Teacher performance is a reflection of their competency (Rostini et al., 2022). It is evident from the existing literature that studies on the classroom performance of teachers are primarily concerned with variables that relate to specific teacher competencies. To be successful in the classroom, one must possess teaching competencies. It is difficult to perform well in a teaching or learning activity without competence. According to Supriyanto et al. (2019), there are a number of factors that influence people's behavior and ultimately affect their performance when it comes to teaching competence.

Mawoli & Babanyako (2011) found competence to affect individual behavior, thereby affecting performance. Competence is one of the most powerful variables that contribute to improved performance (Sulaiman et al.). (2013). The findings confirm that teacher competence plays an influential role in forming teacher performance within an educational institution. Experience and ability were major determinants of a teacher's performance (König et al., 2020). Research has shown that teachers' teaching competencies are positively related to their classroom performance. Teachers' teaching competencies and their classroom performance are, however, influenced by a number of factors. Soft skills are one of the most critical factors (Tehseen & Hadi 2015). It has been shown in several previous studies that soft skills enhance the performance of teachers in the classroom. The teaching profession requires a combination of hard and soft skills. In spite of this, it is important to assess how far soft skills have been integrated into the teaching profession (Heckman & Kautz, 2012). Most teachers lack soft skills, which causes students to dislike them (Hendarman & Cantner, 2018). It is important to note that soft skills and teaching competencies are closely related. There have been numerous studies conducted on these variables.

According to Kanokorn et al. (2014), teachers and administrators are highly dependent on soft skills. Based on the results of this study, new teachers are capable of utilizing their knowledge, talents, and potential in a positive way. As per Sherlin (2019), there is a significant relationship between teaching competency and soft skills. Furthermore, according to Balakrishnan and Raju (2015), teaching competency and the acquisition of soft skills are positively correlated. The study conducted by Pachaiyappan and Sadayakumar (2018) indicates that soft skills and teaching competence are significantly
correlated. The study by Matthews and Reddy (2018) found that secondary school teachers possess moderate levels of soft skills, indicating there are areas where their soft skills could be developed.

The literature, however, does not emphasize the importance of soft skills when it comes to the correlation between a teacher's competence and their performance in the classroom. Previous research showed that multiple studies were conducted on these three variables, but no research was found in which soft skills acted as a mediator between the two variables of teaching competencies and classroom performance. And there is also a lack of this kind of research in the Pakistani scenario. Thus, the objective of this study is to determine whether soft skills are prevalent among teachers in universities in Pakistan as well as whether soft skills mediate the relationship between teaching competencies and classroom performance.

2. LITERATURE REVIEW
2.1 Soft Skills

The idea of "soft skills" includes a wide range of traits, such as good manners, the ability to speak a language, good habits, friendliness, and optimism (Heckman & Kautz, 2012). Kyllonen (2013) says that "soft skills" include a wide range of skills and abilities that people can use at work. Skills such as teamwork, leadership, communication, and problem-solving are among them. "Soft skills" are non-technical abilities that are important to how you carry out your job responsibilities. Soft skills include the ability to work cooperatively, solve problems, and manage your workload (Matteson et al., 2016).

"Soft skills" refer to the personal characteristics needed to succeed in a variety of professions without specialized training. There are several names applied to soft skills, including generic skills, professional skills, functional skills, core skills, key skills, basic skills, employability skills, life skills, career skills, social-emotional skills, and 21st century skills (Succi & Canovi, 2020).

Caeiro-Rodriguez et al. (2021) state that "soft skills" are a person's personality traits, social graces, language skills, personal habits, friendliness, and optimism, which vary from person to person. Soft skills that all teacher education programs should teach were communication, thinking, problem-solving, teamwork, information management, lifelong learning, entrepreneurial skills, ethics, morals, professionalism, leadership skills, and lifelong learning skills (Pachauri and Yadav, 2014).

According to Cinque (2015), there is a causal relationship between soft skills and professional and personal success. Tang (2020) shows that "soft skills" can be thought of as a complex mix of traits, culture, and situation. Carlson et al. (2015) point out that there are various types of soft skills, such as thinking skills, listening skills, communication skills, problem-solving skills, decision-making skills, and negotiating skills. Finally, it is concluded that a soft skill is a set of skills that individuals require in order to cope with globalization, digital transformation, collaborative progress, creative progress, finding competent human resources, and rapidly adapting to changes in a rapidly changing environment.

2.2 Teaching competencies

The concept of competence is more than simply a collection of knowledge and skills; it includes the ability to mobilize psychosocial resources (such as skills and attitudes) to meet complex challenges. The complex challenges of today's world require teachers to possess a wide range of competencies (Albrahim, 2020).

The competency of a teacher is an integral part of an effective training process, one that strives to contribute to the wellbeing of a country or the entire world (Pit-ten Cate et al., 2018). Teacher competencies include classroom management, facilitation, assessment, and organisation and planning (Mukhamadovna et al., 2020). Starkey (2020) points out that teacher competence goes beyond knowledge and skills to include beliefs, motivations, and self-management. According to Aspelin & Jonsson (2019), teaching competence encompasses knowledge and skills, as well as the ability to apply them in multiple scenarios and under a variety of circumstances, many of which are stressful or unpredictable.

Tejedor et al. (2019) state that teaching competencies include being able to take part in team decision-making, to contribute to team decisions, to show accountability for those decisions, and to show a commitment to each student and their unique needs in the classroom. The skills of the teacher are very important for the "well-being" of the students and for giving them a good education (Lucas et al., 2021). Teachers who have teaching competencies will be able to improve the way they teach and help their students do better in school (Christie & Lingard, 2020). In order for teachers to be effective, they must have the following competencies: pedagogic competence, personality competence, professional competence, and social competence. According to Hartiwi et al. (2020), teachers must possess pedagogical and professional competencies in order to be effective in the classroom. Van Werven et al. (2023) describe two types of teacher competencies. The first is pedagogical, and the second is professional competency. Murkatik et al. (2020) explain that the pedagogical competence of a teacher can be summarized as follows: gaining insight and understanding from students; developing curriculums and syllabuses; developing educational and logical learning; evaluating learning outcomes; and developing students into productive citizens. Expertise in the subject matter on a broad and in-depth level is an essential component of professional competence. It is essential that the student master both the content and structure of school subjects (Mukhamadovna et al., 2020).

Teacher's professional competence is made up of his or her skills, knowledge, beliefs, and motivations, which all work together to show how well he or she can do the job (Sang et al., 2019). A teacher's professional competence is classified into three categories by Aspelin & Jonsson (2019): pedagogical competence, personal competence, and social competence. As part
of pedagogical competence, a person must have intellectual abilities, such as knowledge of subjects, teaching, learning, behavior, and counseling, administrative class knowledge, experience assessing learning outcomes, community knowledge, and other general knowledge. Personal competency in teachers means that they are able and willing to deal with problems that come up in their profession or job. To measure social competence, a person must show that they can do a wide range of skills and actions, such as teaching, guiding, assessing, using teaching aids, communicating with and interacting with students, making students feel like they are learning, preparing and planning classes, running administrative classes, and so on.

2.3 Classroom performance

The degree to which a teacher achieves the predetermined objectives in the classroom determines how well that teacher performs. In terms of classroom performance, there is a lack of a rigorous definition that could be used to describe its scope (Purwanto et al., 2020). A teacher’s classroom performance can be described as his or her performance while performing his or her duties and responsibilities as a teacher and educator in the school (Khan et al., 2016). Purwanto et al. (2020) illustrate the concept that a teacher's classroom performance is whatever the teacher is doing in the classroom, including completing his educational duties and responsibilities. Wu et al. (2019) state that teacher performance in the classroom is seen as a status that describes a teacher's ability to do his job and his actions in the classroom.

Mahaputra and Saputra (2021) explained that the teacher's performance in the classroom is described as his or her ability to fulfill his or her duties and obligations within the classroom. Son et al. (2013) argue that a teacher's performance in the classroom is determined by the skill with which they perform tasks in accordance with a set of expectations. According to Abu Nasra and Arar (2020), the performance of a teacher in the classroom is a set of behaviours that he or she portrays to students. According to Mulang (2021), a teacher's classroom performance is determined by his ability to fulfill his duties and responsibilities as a teacher.

Asim et al. (2023) examined how a teacher's performance in the classroom reflects what the instructor accomplishes during the learning process. This includes planning, carrying out, and evaluating learning activities. Sudarjat et al. (2015) explain that a teacher's performance in the classroom is determined by the work and activities he or she has done to meet the job requirements in a certain amount of time and based on how well they complete the job’s requirements or competencies in a predetermined amount of time (Galton & Simon, 2023). Wahyudi (2022) argues that a teacher's performance in the classroom is a function that they perform to fulfill their duties and responsibilities. The aptitude and proficiency of teachers in the classroom play a significant role in their performance.

2.4 Conceptual Framework

In this study, teaching competencies are seen as independent variables, classroom performance is seen as a dependent variable, and soft skills are seen as a mediator variable. This framework shows the direct effect that teaching competencies have on classroom performance and the indirect effect that teaching skills and soft skills have on classroom performance. Regression analysis was used to test the hypothesis.

![Fig. 1: Hypothesized Model](image)

**H1:** Teaching competencies have a positive and significant relationship with the classroom performance of university teachers.

**H2:** Teaching competencies have a positive and significant relationship with the soft skills of university teachers.
H3: Soft skills have a positive and significant relationship with the classroom performance of university teachers.

H4: Soft skills mediate the relationship between teaching competencies and classroom performance for university teachers.

3. Materials and Methods

The study was quantitative and conducted in accordance with the positivist paradigm of research. It has been decided to test the hypotheses using a descriptive and cross-sectional research design. In this study, three primary research questions were investigated, including: (1) what is the direct impact of teaching competencies on soft skills and classroom performance? (2) the direct effects of soft skills on university teachers’ classroom performance; and (3) how soft skills mediate the relationship between the teaching competencies of university teachers and their classroom performance.

3.1. Measures

The researchers used three research instruments: two surveys for teaching competencies and one for soft skills. Researchers chose an observation sheet to assess teachers’ classroom performance. The study used six dimensions for teaching competencies: subject mastery, learner psychology, assessment technique, classroom management, effective communication, and instructional planning. These dimensions were chosen based on the 2009 national professional standards for instructors. Researchers chose six soft skills: teamwork, problem solving, leadership, time management, adaptability, and communication. Soft skill dimensions were chosen using UNSECO and WHO recommendations. On a five-point Likert scale, both teaching competencies and soft skills were assessed. The dependent variable in this study is the classroom performance of university teachers, which was measured on a three-point scale of observation with 45 items. In 2009, observation was created on the basis of national professional standards for instructors. Expert validation was employed for instrument validation, as well as Cronbach's alpha for questionnaire (teaching competencies and soft skills) reliability; their values were 0.87 and 0.93, respectively, while inter-rater reliability was used for observation. The value of kappa was 0.76, indicating that the observation was reliable.

3.2. Population and Sampling

The study’s target population included all university teachers employed in the public sector in Punjab. Using multistage sampling, the researchers selected a sample from the study. The following three major public sector universities were chosen in southern Punjab: Bahauddin Zakariya University in Multan; Islamia University in Bahawalpur; and Ghazi University in Dera Ghazi Khan, where the Departments of Education, English, mathematics, computer science, and management science were located. Researchers selected a representative sample of teachers from selected universities and departments. A total of 132 university teachers were included in the study.

3.3 Data Collection and Data Analysis

A survey strategy was used to collect data from relevant respondents. The researchers collected data through personal visits to the educational institutes to get more accurate results and successfully maintained 132 responses (questionnaire and observation). In order to analyses the data for the current study, researchers used SPSS and Process Macros. Linear regressions have been used to analyses the relationship between the independent and dependent variables and also to test the mediator.

4. RESULTS OF STUDY

Hypothesis (H1): teaching competencies has significant relationship with classroom performance of university teachers.

**Table 1. Linear regression between teaching competencies and classroom performance**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of Estimate</th>
<th>ANOVA Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.370*</td>
<td>.173</td>
<td>.170</td>
<td>.98024</td>
<td>.000</td>
</tr>
<tr>
<td>Predictors: (Constant), teaching competencies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unstandardized Coefficients</td>
<td>Standardized Coefficients</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>Standard error</td>
<td>Beta</td>
<td>T</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.744</td>
<td>.281</td>
<td>7.769</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.562</td>
<td>.068</td>
<td>.370</td>
<td>7.946</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dependent Variable: Classroom performance</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 01 indicates that there is a linear relationship between teaching competencies and classroom performance. The ANOVA results are significant, which indicates a good fit for the model. According to the R-square method, there is a 17.3% variance in classroom performance based on teaching competencies (R-square = t is significant), which indicates a good fit for the model. According to the R-square method, there is a 17.3% variance in classroom performance based on teaching competencies (R-square =.173), and the unstandardized coefficient value is statistically significant (B =.562, 0.001). In other words, if all other variables remain constant, a one-unit increase in teaching competencies results in a 562-unit increase in
classroom performance. This proves that there is a significant positive relationship between the teaching competencies of university teachers and their classroom performance. As a result, H1 is accepted. Hypothesis (H2): Teaching competencies has positive and significant relationship with soft skills of university teachers.

Table 02, Linear regression between Teaching Competencies and Soft Skills

<table>
<thead>
<tr>
<th>Model Summary</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of Estimate</th>
<th>ANOVA Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1</td>
<td>.367*</td>
<td>.135</td>
<td>.132</td>
<td>1.04963</td>
<td>.000</td>
</tr>
<tr>
<td>a. Predictors: (Constant), Teaching competencies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unstandardized Coefficients</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Standard error</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teaching competencies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dependent Variable: Soft skills

In Table 02, there is a linear relationship between teaching competencies and soft skills. ANOVA is significant, which indicates that the model is well fitted. As a result of teaching competencies, we find a 13.5% variance in soft skills (R-square = .135) and a significant value for the unstandardized coefficient (B = .564, .001). In other words, if other variables remain constant, a change in soft skills will increase by 564 units for every unit increase in teaching competency. Thus, teaching competencies and soft skills have a significant positive relationship. As a result, H2 is accepted. Hypothesis (H3): Soft skills have positive and significant relationship with classroom performance of university teachers.

Table 03, Linear regression between Soft skills and classroom performance

<table>
<thead>
<tr>
<th>Model Summary</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of Estimate</th>
<th>ANOVA Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1</td>
<td>.859*</td>
<td>.737</td>
<td>.736</td>
<td>.49985</td>
<td>.000</td>
</tr>
<tr>
<td>a. Predictors: (Constant), Soft skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unstandardized Coefficients</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Standard error</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soft skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dependent Variable: Classroom performance

In Table 03, there is a linear relationship between soft skills and classroom performance among university teachers. The ANOVA is significant, indicating a well-fitted model. It is evident from the data that there is 73.7% variance in classroom performance by soft skill (R-square = .737), and the unstandardized coefficient values are both significant and positive (B = .742, .001). The result is that by maintaining other variables constant, there will be a change of 0.742 units in classroom performance for every change in soft skills. This indicates that there is a significant positive correlation between soft skills and classroom performance. As a result, H3 is accepted.

Hypothesis (H4): soft skills mediate the relationship between teaching competencies and classroom performance university teachers.

In Table 04, three models are examined that test the mediating role of soft skills in the relationship between teaching competencies and classroom performance. Model 1 illustrates the direct relationship between teaching competencies and classroom performance. In model 1, the standardized coefficient is positive (Beta = 0.370) and significant (0.001). According to Model 2, the relationship between teaching competencies and soft skills is significant and positive (Beta = 0.367, 0.001). Based on Model 3, the standardized coefficient between teaching competencies and classroom performance has been reduced from 0.370 (direct effect) to 0.051 (indirect effect), roughly equal to zero. As a result, a soft skill serves as an almost perfect intermediary between teaching competencies and classroom performance. It mediates the effect by 0.318 (0.367 * 0.868 = 0.318). There is evidence that soft skills mediate the relationship between teaching competencies and classroom performance. Therefore, H4 is accepted.
Table 04 Mediation analysis

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sign.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Standard error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>1.744</td>
<td>.218</td>
<td>7.969</td>
</tr>
<tr>
<td></td>
<td>Teaching Competencies</td>
<td>.526</td>
<td>.068</td>
<td>.370</td>
</tr>
<tr>
<td></td>
<td>Dependent Variable: Classroom performance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>(Constant)</td>
<td>2.007</td>
<td>.231</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Teaching Competencies</td>
<td>.554</td>
<td>.073</td>
<td>.367</td>
</tr>
<tr>
<td></td>
<td>Dependent Variable: soft skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>(Constant)</td>
<td>.098</td>
<td>.118</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Teaching Competencies</td>
<td>.073</td>
<td>.036</td>
<td>.051</td>
</tr>
<tr>
<td></td>
<td>soft skills</td>
<td>.820</td>
<td>.024</td>
<td>.868</td>
</tr>
</tbody>
</table>

5. CONCLUSION

The major goal of this paper was to examine the significant relationship between teacher competency and classroom performance as well as the mediating role of soft skills in this relationship. According to the results shown above, there is a significant relationship between the dependent and independent variables under discussion in this research paper. This study developed four hypotheses to test and obtain findings. These hypotheses were developed on the basis of literature, with H1 focusing on the relationship between university teachers’ teaching competencies and classroom performance. H2 tested the relationship between the teaching competencies and soft skills of university teachers. H3 tested the relationship between soft skills and the classroom performance of university teachers. The H4 hypothesis was tested for the role of soft skills in mediating the relationship between teaching competencies and classroom performance of university teachers. The results of the linear regression analysis revealed a significant relationship between teaching competencies, soft skills, and university teachers’ classroom performance. On the basis of the results, it was concluded that H1, H2, H3, and H4 were accepted. It was found that soft skills mediate the relationship between teaching competencies and classroom performance.

Limitations of the Study

The limitations of this study should be considered by future researchers. It has been found that questionnaires can be an efficient and effective means of collecting data; however, questionnaires may have certain limitations, including biases in the questions. There is a possibility that respondents did not answer the questionnaire according to actual conditions, or they responded according to what they believed to be ideal conditions rather than actual conditions. In some cases, these factors could lead to inaccurate measurements and a lack of representation of variables. Due to the limited analytical ground, the small sample size also limits the ability to discover additional findings. These results are limited to the public-sector university teachers in southern Punjab.

Recommendations

Due to its limitations, the study does not examine the extent to which competence affects teacher performance through the mediation of soft skills. As a result, it is suggested that the proposed research should include variables that may be influencing the performance of teachers in the classroom, such as work satisfaction, work discipline, compensation, motivation, etc. It is anticipated that future studies will focus on educational institutions such as public schools, private schools, and others. It is proposed to determine a broader scope of objectives and obtain more representative results.

Researchers make some methodological recommendations to future researchers. It is suggested that future researchers use a mixed-methods approach to their work. A mixed-methods approach that combines quantitative and qualitative methods could benefit the study and provide more accurate results. Structured interviews can be done with a small group of university teachers to get qualitative data. The interviews can be set up to find out what teachers know and think about teaching skills, soft skills, and how well their students do in the classroom. Interviews provide more in-depth information, which increases the credibility of the study. The sample should be chosen at random from a group of university teachers so that the results can be applied to a larger group. Validated instruments should be used to measure teaching skills, soft skills, and classroom performance. This will improve the data’s reliability and validity, as well as the credibility of the results.

Credit Author Statement

Amna Saleem: Methodology, Data curation, Writing-Original draft preparation, Visualization, Investigation. Dr. Zarina Akhtar: Conceptualization, Software implementation, Supervision, Validation.
COMPLIANCE WITH ETHICAL STANDARDS:

It is declared that all authors don’t have any conflict of interest. Furthermore, informed consent was obtained from all individual participants included in the study.

REFERENCES


