RESEARCH ARTICLE

# Assessment of workplace related factors affecting tolerance of ambiguity among trainee doctors

Shazia Inam[1], Masood Jawaid[2], Rehan Ahmed Khan[3]

## Abstract

**Objective:** To assess workplace factors influencing the tolerance of ambiguity among trainee doctors.

**Methods:** The sequential mixed-method study was conducted from June 2021 to February 2022 at the Fauji Foundation Hospital, Islamabad, Pakistan, and comprised postgraduate trainee doctors of either gender associated with various specialties. The baseline tolerance of ambiguity score was established using the Tolerance of Ambiguity in Medical Students and Doctors scale. A group of selected trainees was interviewed face-to-face to examine the workplace factors that they regarded as beneficial or detrimental to their tolerance of ambiguity. Quantitative data was analysed using SPSS 24 and thematic analysis was done for qualitative data.

**Results:** Of the 132 subjects, 59 (21.9%) were males and 73 (55.3%) were females. The overall mean age was 20.95±2.186 years. Of the total, 55(41.7%) subjects were in the first year of training, 28(21.2%) in the second year, 26(19.6%) in the third year, and 23(17.4%) in the fourth year. There were 78(59.1%) trainees who were married compared to 54(40.9%) who were unmarried. Against the baseline tolerance of ambiguity score of 132, the overall aggregate mean tolerance of ambiguity level was 71.28 ± 5.81 showing a moderate level. There was no significant correlation between the tolerance of ambiguity and the trainees' age, years of training and marital status ($p$>0.05). The qualitative phase comprised interviews with 9(6.8%) subjects. Thematic analysis suggested that the trainees perceived autonomy, peer support, supervisor support, manageable workload, and professional development opportunities as facilitators of tolerance of ambiguity, while barriers were identified as poor physical environment, attitude of seniors and supervisors, management issues and excessive workload. During the coronavirus diseae-2019 pandemic, excessive workload and fear of infection were identified as factors affecting tolerance of ambiguity.

**Conclusion:** The medical trainees were found to have a moderate level of tolerance to ambiguity. Autonomy, peer support, supervisor support, manageable workload, and professional development opportunities contributed positively to this aspect.

**Keywords:** Clinical uncertainty, Clinical decision-making, Mental health, Workplace stress, Physicians.

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## Introduction

Despite enormous advancements in the medical field and the use of modern technologies, medical practice remains essentially uncertain. Doctors are consistently faced with uncertainty while making diagnostic and clinical management decisions.[1] Research shows that uncertainty leads to distress, discontentedness, and inability to take appropriate decisions, which is ultimately responsible for burnout in physicians.[2] Burnout is the phenomenon of draining of mental and physical strength or determination, commonly due to excessive strain or burden,[3] which can result in poor performance and inappropriate care being given to the patients. Thus, physicians must stay tolerant while facing ambiguous situations in their clinical practice to provide optimum care to the patients.[4] The importance of tolerance of ambiguity (TOA) has been widely accepted in recent years. TOA is the ability to process information that is confusing, diverse, incoherent, having multiple meanings, and which could be an actual or potential cause of stress in an individual.

A systematic review conducted by Hancock and Mattick[5] put forward a conceptual model built on work already done by Hillen et al.[6] This systematic review revealed that medical students and doctors with low TOA have a greater chance of developing mental health issues (Figure-1). The proposed conceptual model recommends the use of 'Tolerance of Ambiguity in Medical Students and Doctors'(TAMSAD) Scale for assessing the level of tolerance of ambiguity in trainee doctors. This model also provides a ground for future research, particularly exploring the association of workplace factors with the mental health and TOA of doctors.

Some studies have already explored the influence of resilience, gender, age, and marital status on TOA of

[1]Department of Medical Education, Foundation University Medical College, Islamabad, Pakistan; [2]PharmEvo Private Limited, Karachi, Pakistan; [3]Riphah International University, Islamabad, Pakistan.

**Correspondence:** Shazia Inam. e-mail: shaziainam26@gmail.com

ORCID ID. 0000-0001-5793-7724

doctors. However, the impact of workplace and cultural environment on TOA and ultimately on doctors' psychological wellbeing has not yet been studied.[5] The current study was planned to fill this gap by assessing workplace factors influencing TOA of young doctors.

## Subjects and Methods

An explanatory, sequential, mixed-method study was conducted from June 2021 to February 2022 at the Fauji Foundation Hospital (FFH), Islamabad, Pakistan. The FFH is an 850-bed tertiary care hospital providing clinical clerkships in 13 specialties to post-graduate trainees. The subjects included in the current study were postgraduate trainees (PGTs) who had completed a minimum of one year of the Fellowship of College of Physicians and Surgeons (FCPS) training in a particular speciality, and who gave informed consent for participation. The subjects who were not willing to participate were excluded.

The research flow was organised sequentially. Phase 1 involved the collection and analysis of quantitative data, while phase 2 involved qualitative data collection and analysis. In this phase, an iterative approach was used for data analysis, where analysis was initiated before the completion of data collection.[7]

Quantitative data was collected using a questionnaire-based survey, which was followed by face-to-face, semi-structured interviews for the collection of qualitative data.

A validated Tolerance of Ambiguity in Medical Students and Doctors (TAMSAD) scale was used to assess TOA of the subjects. This 29-item TAMSAD scale was developed through a study conducted on 262 medical students at a medical school in the UK. The Cronbach's alpha of 0.80 indicated that it had good internal consistency in that setting.[8]

The instrument was pretested on 15 trainee doctors at FFH working in different specialties who were selected through convenience sampling. The alpha score of the scale was 0.73.

After approvals from the ethics review board of the Foundation University Medical College, Islamabad, the sample size was calculated using Statistics Kingdom calculator[9] with 95% confidence interval, 5% margin of error and reported standard deviation of TAMSAD score ±7.85.[10]

During phase 1 of the study, the data obtained from 132 participants was imported into the Statistical Package for Social Sciences (SPSS) Version 24.

Descriptive and inferential statistics were employed. The final scores were linearly transformed to a 0-100 scale. Trainees having a total score of above 75 were categorized as high scorers, while those having a score between 50-75 were labelled as moderate scorers and trainees having a score of <50 were low scorers.

Categorical variables were expressed as frequencies and percentages, while numerical variables were analysed using Mean and Standard Deviation. Fisher Exact test was used to find the association of demographic variables with TOA levels (low, moderate, and high) (Table-2). Independent t-test was used to compare mean TOA score with age and marital status of the participants. Analysis of variance (ANOVA) was employed to compare mean TOA score with year of training of the participants. $P \leq 0.05$ was considered significant.

In the qualitative phase, four high scorers and four low scorers were initially enrolled using purposive sampling technique on the basis of phase 1 questionnaire. This was followed by interviewing another high scorer to ensure the attainment of saturation point. The interview guide was formulated containing five questions and was sent to 4 medical educationists for expert approval. A pilot study was conducted on 2 trainee doctors in December 2021. The participants agreed to have recorded face-to-face, semi structured interviews. Each interview lasted 30-35 mins. All interviews were audio recorded. Each interview started with an open-ended question, like; what do you understand by the term TOA?' and 'Do you think that your workplace environment impacts your ability to react in ambiguous situations?'.

Once the participants started sharing their perceptions about the workplace environment, they were asked a few probing questions to identify the workplace factors impacting their TOA. At the end of each interview, the subjects were asked about any suggestions that could improve the TOA of trainees. Once data saturation was attained, the interviewing process was stopped. All the interviews were transcribed manually. The transcribed interviews were read in detail. Related segments of the text were identified, and open codes were generated which were reduced to categories, and then to 3 themes.

To confirm data credibility, triangulation and member checking of the transcribed data were employed.

## Results

Of the 132 subjects, 59 were males and 73 were females. The overall mean age was 20.95±2.186 years. Of the total, 55(41.7%) subjects were in the first year of training, 28(21.2%) in the second year, 26(19.6%) in the third year,

and 23(17.4%) in the fourth year. There were 78(59.1%) trainees who were married compared to 54(40.9%) who were unmarried (Table-1).

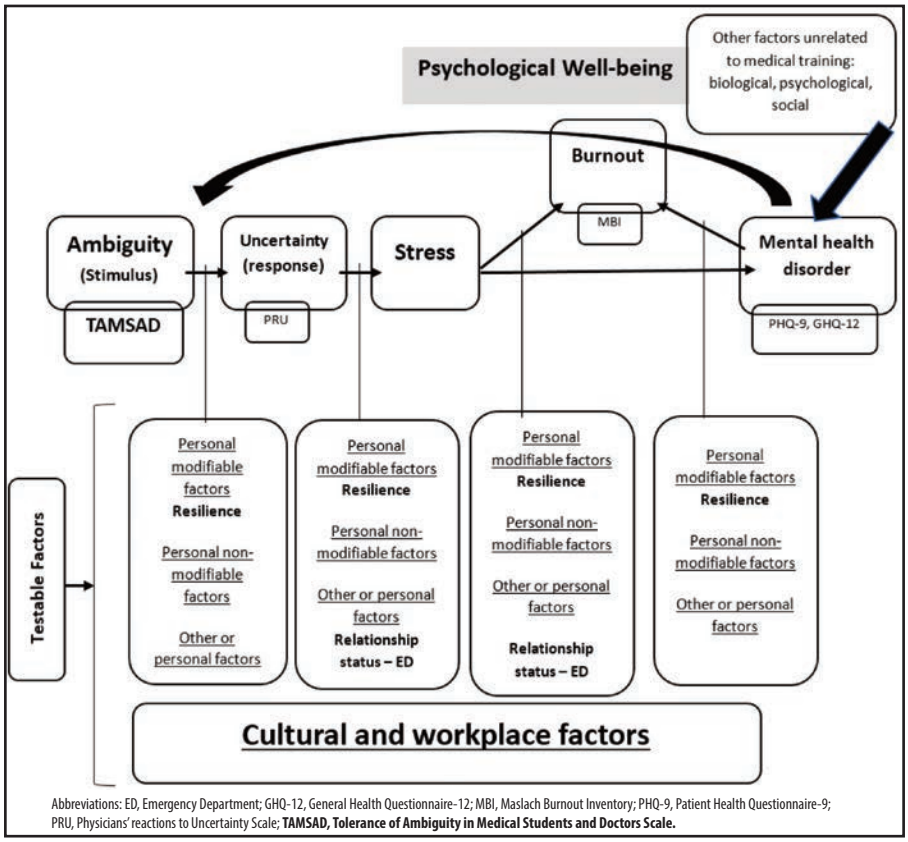


**Figure-1:** Conceptual Model by Hancock and Mattick.

**Table-1:** Baseline characteristics (n=132).

| Parameters | n (%) |
|---|---|
| **Mean Age** (years) | 20.95±2.186 |
| **Year of training** | |
| 1st Year | 55 (41.7%) |
| 2nd Year | 28 (21.2%) |
| 3rd Year | 26 (19.7%) |
| 4th Year | 23 (17.4 %) |
| **Marital Status** | |
| Married | 78 (59.1%) |
| Unmarried | 54 (40.9%) |

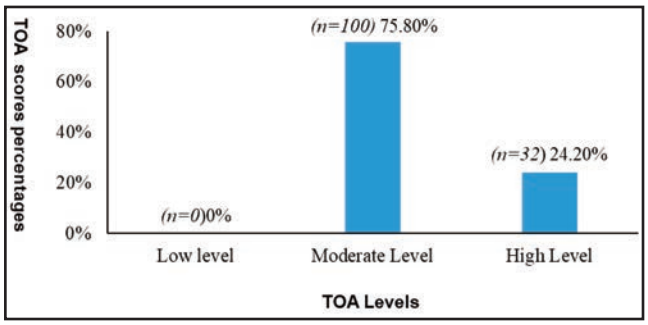


**Figure-2:** Tolerance of Ambiguity (TOA) levels.

The overall aggregate mean TOA level was 71.28±5.81 showing a moderate level of TOA in this study. 100 trainees (75.8%) had moderate Tolerance of Ambiguity while 32 (24.2%) had high Tolerance of ambiguity (Figure-2).

There was no significant correlation of TOA with the trainees' age, year of training and marital status ($p$>0.05) (Table-2).

The qualitative phase comprised interviews with 9(6.8%) subjects. Three main themes emerged: Facilitators of TOA, Barriers to TOA, and Coronavirus disease-2019 (COVID-19) Pandemic and TOA.

The first theme had 6 categories: autonomy, peer support, supervisor's support, manageable workload, health management system, and professional development opportunities.

Autonomy of decision-making was indicated by 4(44.4%) participants to critically affect their TOA. One resident said: "*First, our department is very forthcoming. We get supervised OPD (outpatient department) days during our first few weeks and then we get to do independent OPD as well*".

Trainees also viewed peer support as a critical factor that influenced their TOA.

One participant said: "*The positive thing is that we have juniors to have our back and seniors to take guidance from. Having people by your side makes you confident. Peer support greatly helps us*".

**Table-2:** Association of Tolerance of Ambiguity (TOA) with demographic variables.

| Parameters | Tolerance of Ambiguity | | | *p*-value |
|---|---|---|---|---|
| | Low | Moderate | High | |
| **Age** (years) | | | | 0.558 |
| ≤ Mean Age | - | 59 (44.7) | 17 (12.9) | |
| ≥ Mean Age | - | 41 (31.1) | 15 (11.4) | |
| **Year of training** | | | | 0.397 |
| 1st Year | - | 41 (31.1) | 14 (10.6) | |
| 2nd Year | - | 24 (18.2) | 4 (3.0) | |
| 3rd Year | - | 20 (15.2) | 6 (4.5) | |
| 4th Year | - | 15 (11.4) | 8 (6.1) | |
| **Marital Status** | | | | >0.999 |
| Married | - | 59 (44.7) | 19 (14.4) | |
| Unmarried | - | 41 (31.1) | 13 (9.8) | |

Supervisor support was seen as another crucial factor that influenced TOA. According to one trainee: "*When we have our rounds, our supervisor asks questions that challenge our critical thinking and decision-making. He asks if we have dealt with a patient calmly and if we have given them the right treatment*".

The workload was also found to be a factor that may impact mental health and TOA of trainee doctors. One resident was of the view that the workload at his workplace was not hectic. According to him: "*Surgery is a hectic field but our roster is relatively manageable. We can maintain a work-life balance.*"

One of the participants shared that the availability of a good hospital management system facilitated the TOA of trainee doctors. He said: "*Regarding this hospital, I am glad that I work in a tertiary care hospital that is well-renowned. There is a good patient influx. I like that we have a hospital management system that helps me see old records of patients.*"

Finally, capacity-building workshops were found to be an important factor in improving the TOA of trainees. One participant said that trainees in the clinical setting were given opportunities to learn through workshops and case presentations.

The second theme had 6 categories: Workplace environment, Attitude of seniors, Management issues, Workload, Attitude of supervisor, and Attitude of attendants.

A few trainees perceived an unsatisfactory workplace environment to be responsible for reducing their TOA. One participant said: "*We don't have a comfortable sitting area in the ER (emergency room) where we work a lot. There are only 2 chairs for the whole call. There are no healthy and clean eating options if we are present at the hospital at a stretch for 20-36 hours.*"

Another participant highlighted that the inappropriate attitude of senior faculty members contributed to the low TOA of trainee doctors. "*Our knowledge does not improve, but seniors sometimes insult us if we don't know a topic. It also affects our patient management. The attitude of senior faculty members and consultants is sometime insulting and humiliating.*"

Trainees also viewed administrative mismanagement as a critical factor that decreased their TOA. A resident was of the view that the resources did not match the patient influx. Another one shared that the salaries of trainees were very low which affected their morale and TOA. One participant reported that the lack of job security also affected them negatively.

Some participants argued that long working hours were responsible for decreased TOA in trainee doctors. One resident said: "T*he factors which decrease my TOA are excessive workload and long working hours. We have units on call. After an OPD, we also have to go to the wards. We reach home at 9.30 pm and sometimes we also have to stay for the night. We miss meals and never eat healthy food. There is also sleep deprivation, and we are never calm.*"

Another trainee perceived the lack of communication of trainee doctors with the supervisor to be another factor that could influence the TOA of trainees. Finally, the attitude of attendants of patients was also found to influence the TOA of trainees. One trainee mentioned that the inappropriate attitude of attendants of the patients hampered their TOA.

The third theme had 5 categories: Workload, Uncertainty about pandemic, Fear of infection, Effect of COVID-19 on TOA, and Duties in COVID-19 High-Dependency Units (HDUs).

There were divergent views regarding workload during the scenario of the pandemic. Participants of surgical specialties experienced less workload during the pandemic. According to one surgery trainee: "… *many elective surgeries have been postponed because of COVID-19. Previously during ER calls, we used to have 3-4 admissions on average, now there is only 1 admission on average.*"

Trainees of Medicine, however, experienced excessive workload during the pandemic. One Medicine trainee said: "*COVID-19 has affected everybody. We are presented with positive patients daily. We also have to work longer hours compared to the pre-pandemic phase.*"

Trainees also argued that uncertainty about the pandemic influenced their TOA. One participant said: "I*t increases our stress. It has affected our TOA because it is a novel virus, and it is a new pandemic. There has not been detailed research done on it. Patients can present with symptoms that overlap with other conditions. We need to be very vigilant. These overlapping results make decision-making very difficult for us.*"

A lot of participants saw the fear of infection as a crucial factor that influenced their TOA. Most of the participants feared infecting their loved ones with COVID-19.

In addition, the pandemic was held responsible by one participant for critically affecting their mental health and TOA. According to the trainee: "*The pandemic has not only affected the physical health but also the mental health of doctors. It has affected the abilities of doctors to cope with*

*difficult and stressful situations. With time we might be able to overcome this pandemic, but at the moment it has influenced our ability to react in ambiguous situations.*"

A few trainees argued that the duties in COVID-19 HDUs had influenced their TOA. One resident said: "*We also have duties in COVID-19 HDU where the patients are very critical. This decreases our TOA.*"

Another resident said the pandemic had reduced the focus of trainees on their parent specialties. He said: "*I would want to mention that we have to do shift duties in COVID-19 ward, so we cannot completely focus on our respective specialties.*"

## Discussion

To the best of our knowledge, the current study is the first mixed-method sequential explanatory research to explore the impact of workplace environment on TOA of trainee doctors.

The overall aggregate mean TOA level was 71.28±5.81 showing a moderate level of TOA of trainee doctors. Budner's scale of Ambiguity Tolerance has been used in several studies[10,11] in the past, especially in the United States. However, most of these studies showed a low level of TOA in medical students. The mean TOA score was <55 in all these studies.

Regarding TOA facilitators, 4 participants considered autonomy of decision-taking to critically affect their TOA. A similar study conducted in the past has emphasized inculcating clinical autonomy in trainee doctors. It was suggested that the trainees should be encouraged to play a leading role in patient management.[12]

Positive supervisor support and peer support were also found to play an important part in increasing the TOA of trainees in the current study. A similar study highlighted that a trustworthy and supportive supervisor can be of great help in the progress of trainee doctors.[13] In addition, a qualitative study[14] explored perceptions of physicians regarding peer support in workplace and reported that social support played a very important role in reducing workplace stress. Capacity-building workshops were found to be another factor that can improve the TOA of trainees. A study found that doctors who were trained through continuing professional development workshops stayed more tolerant and satisfied at their workplaces.[15]

Regarding barriers to TOA, excessive workload was found to be a major factor that may decrease the TOA of trainee doctors. A study found excessive workload to be a form of mistreatment and abuse at workplace.[16]

Inefficient organizational management was found to be another factor that can impact on the TOA of trainee doctors. An earlier study revealed that the decision of the employees to quit the job was strongly linked to poor organisational management.[17]

Inadequate resting place and eating facilities were the physical and environmental factors that were found to affect the TOA of trainee doctors in the present study. In an explorative sequential mixed-method study[18] conducted on the employees of public hospitals, burnout, low morale, and stress were found to be linked to poor and inappropriate working conditions.

Lastly, workload and fear of infection were identified as major workplace factors influencing the TOA during the COVID-19. pandemic. A mixed-method study assessing the factors affecting doctors during the pandemic reported excessive workload, postings, lack of autonomy, and inability to maintain work-life balance to be the major issues.[19]

Due to the nature and our inability to identify it easily, the Intolerance of ambiguity is a major challenge for healthcare managers and administrators. These individuals should devise such curricula which would deliberately expose the trainee doctors to ambiguous clinical scenarios.[20] Furthermore, the issue needs to be handled adequately in the local settings where the burden of healthcare falls mainly on the shoulders of a very small number of trainee doctors. Moreover, COVID-19 has further influenced the mental health and TOA of trainees. The more satisfied are these professionals at their workplace, the more they would be able to stay tolerant in ambiguous situations and provide the best care to the patients. The current findings suggest numerous changes that can be made to the current workplace environment of PG trainees in the country, such as increased induction of trainee doctors, better pay structure, more days off, encouraging supervisor support, and an ergonomic work environment for these doctors.

The current study has its limitations as it explored the perceptions of trainee doctors in one institution only. Multi-institutional large-scale studies should be carried out in the future. Besides, the social and cultural context of Pakistan is entirely different from other countries, and, as such, the results are not fully generalisable.

## Conclusion

The majority of trainee doctors were found to have a moderate TOA level. Autonomy, peer support, supervisor support, manageable workload, and professional development opportunities were found to enhance the TOA of PG trainees. However, the attitude of supervisors,

poor physical environment, excessive workload, and administrative mismanagement were found to be barriers to the TOA of trainee doctors. Hospital managers, administrators and supervisors should take appropriate measures to promote the TOA in doctors by designing efficient workplace environments. Similar studies on the topic are needed from other countries.

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