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Trypanophobia among medical students - An overlooked concern

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ABSTRACT

Introduction: Trypanophobia or needle phobia is a concern for many when it comes to vaccinations, injectable medicines, blood draws, donations and thus can form a basis of avoidance of certain procedures in healthcare professionals. Our study thus, aims to assess the proportion and risk factors associated with Trypanophobia among medical undergraduates.

Methodology: The protocol was presented to approved by the Institutional Ethics Committee (IEC) and permission from the college authorities was obtained. An online questionnaire was developed and the link to the google form was circulated among all the students studying at the college. Responses were compiled, analysed and then reported. The Injection Phobia Scale – Anxiety, an 18 point questionnaire was used to assess the degree of anxiety experienced by students in stressful situations due to their needle phobia.

Results: The mean age of the study participants was 19.6 ± 1.2 years (17–24 years) and 179 (35.7%) were males. Trypanophobia was seen in 155 (30.9%) students and 115 (35.7%) were females ($p = 0.002$). 282 (56.3%) students thought that such a fear should not be seen students in the health care setting. Anxiety was the symptom seen in the majority and the degree of anxiety was higher in situations involving contact with needles. Distraction was the most common coping mechanism.

Conclusion: More than one quarter of the respondents had Trypanophobia with majority being females. The degree of anxiety experienced by the students with Trypanophobia increased with the increase in the invasiveness of the procedure.

1. Introduction

Needle phobia, medically known as Trypanophobia can be defined as the fear of needles involved in different medical procedures. It is mainly related to the medical aspect of the fear unlike aichmophobia, belonephobia, and enetophobia which are concerned with the fear of pins, needles and sharp objects respectively.[1] Trypanophobia was first recognised and reported in the Diagnostic and Statistical Manual of mental disorders (DSM-IV) in 1994,[2] under the blood-injection injuries as a specific injury and is prevalent among all age groups.

In people having Trypanophobia, avoidance of needles is generally seen. It has been reported that they avoid having blood draws, taking insulin injections as seen in diabetics, cancel dentist appointments and even refrain from amniocentesis as seen in pregnant women.[3] They may also experience some degree of anxiety, dizziness, panic attacks, palpitations, nausea, a drop in blood pressure accompanied by fainting.[4]

The severity of symptoms and the proportion of Trypanophobia varies considerably with age. Though the condition is generally biopsychological, a larger proportion of adolescents are afraid of needles involved in medical procedures, than adults.[5] There is also evidence stating the familial disposition of Trypanophobia, where descendants of a phobic person are more prone to develop this phobia.[4] This may primarily be due to the behavioural factors and the mannerisms of people in the family towards the medical procedures and the needles involved in them. Similarly, a higher number of females have reported symptoms of fear and phobia as compared to males.[6] Traumatic childhood experiences have also been implicated in some people who have Trypanophobia.[7] Additionally, environmental factors and situations may precipitate an increase in susceptibility to the fear of needles like repeated 'shots' and 'finger sticks'.[8]

The population of Indian medical students is especially vulnerable to trypanophobia, as the current medical education curriculum requires students to familiarize themselves with basic invasive procedures through their time in the course. Students learn to perform many of

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these procedures by initially performing and practicing them on themselves. This includes drawing blood for physiological and biochemical investigations during routine practical classes. Students and medical professionals are also encouraged to act as blood donors, and frequently aid during acute blood shortages in hospitals associated with medical schools. Moreover, the prevalence of potential infection in medical environments also requires students to be immunized against certain diseases, requiring them to undergo appropriate vaccination. But, students afraid of needles may find it difficult to participate in vaccination, blood donation drives and routine practical classes.

Coping mechanisms like deep breathing, relaxing the muscles and lying down while getting an injection may help students having Trypanophobia. Besides, distractions play an important role in ensuring that the patient does not struggle with getting injections. A local numbing agent may also prove useful. In the case of medical students, a long term and efficient method of therapy may be required. Although, continuous exposure during the clinical studies may reduce the fear of needles significantly, seeking professional mental health advice including cognitive therapy and anti-anxiety or sedative medications may be an option in severe cases.[9]

Our study aims at assessing the proportion of and risk factors associated with Trypanophobia among undergraduate medical students along with the perception of the medical students towards those who have Trypanophobia.

2. Materials and methods

The cross-sectional study was carried out among the undergraduate students of Bachelor of Medicine and Bachelor of Surgery (MBBS) and Allied Health Science (AHS) courses studying in different professional years at a private medical college in coastal South India. The study was conducted after obtaining approval for study protocol from the Institutional Ethics Committee (IEC). Permission was taken from the Dean to conduct the study within the college campus.

The sample size was calculated assuming 50% prevalence of Trypanophobia among the medical students. With 10% relative precision 95% confidence level the sample size was calculated to be 400.10% nonresponse error was added to this value to calculate the final sample size which was to be 440.

Data was collected by means of a structured online questionnaire which was sent to all the students enrolled in the MBBS and AHS courses as a google form. All the students who consented were included. They were explained that the information they will provide will solely be for the purpose of research and study which may be published in a journal, and written consent was obtained from them.

The questionnaire composed of two sections, Section One asked participants for their personal information like age, gender, nationality, year of study and course. Section Two was based on trypanophobia and contained five parts - Part A: Perception towards Trypanophobia among medical students (3 questions assessed the perception of the participant towards needle phobia), Part B: Screening questions (5 questions which assessed the presence of Trypanophobia in the participant constituted this part), Part C: Injection phobia Scale – Anxiety[10,11] the 18 point scale was used where the score ranged from 0 to 4 for each point; 0 being the least anxious and 4 being the most; Part D: Health behaviour and Symptomatology (Participants were given various hypothetical situations resembling real life scenarios in the form of 7 questions and the responses were analysed) and Part E: Risk Factors and Determinants (Family history and past experiences were interpreted through 4 questions). 501 responses were collected in the months of March and April 2021. Parts A and B of the questionnaire were answered by all the participants but the remaining parts were administered only to those who had trypanophobia. The data was entered into and further analysed using IBM SPSS for Windows version 25.0, Armonk, New York. The descriptive statistics were then expressed in terms of proportion, mean and standard deviation. The Chi square test was used for analysis and statistical significance was noted with a p value < 0.005. Meaningful results were then drawn from the obtained statistics to come to a conclusion.

3. Results

Out of a total of 501 respondents studying in different professional years at the college, majority (n = 322, 64.3%) were females. The percentage of MBBS students was higher (n = 385, 76.8%) as compared to the students studying Allied Health sciences. Majority of the respondents were Indians (n = 470, 93.8%) and the mean age of the study population was 19.6 (±1.2) years and ranged from 17 to 24 years. Table 1 gives the numbers and percentages associated with the baseline characteristics of the study population.

When the awareness of Trypanophobia among the study population was analysed, it was seen that most students (n = 432, 86.2%) were aware of the fear of needles existing in the society especially the fear associated with needles used in medical procedures while few thought otherwise, or were not sure of their response. Majority (n = 324, 64.7%) of the students responded in affirmative when asked about the existence of the fear of needles involved in medical procedures being present among students in various medicine related courses. On the other hand, some (n = 133, 26.5%) were not sure about the existence of trypanophobia among medical students and few (n = 44, 8.8%) thought that such a fear did not exist among students in medical schools. Although, 56.3% (n = 282) students believed that trypanophobia should not be seen in medical students, 20.2% (n = 101) thought that the existence of such a fear was justified among medical students and 23.6% (n = 118) were not sure.

In spite of the different perceptions of medical students towards needle phobia associated with medical procedures in medical students, more than a quarter of the study population (n = 155, 30.9%) showed signs of Trypanophobia. Within this percentage also, responses were gathered about the various situations where the subjects experienced fear.

Among the students who had Trypanophobia, majority (n = 125, 80.6%) were afraid of needles and sharp objects involved in medical procedures. Though, 81.2% (n = 127) were not comfortable pricking others and 72.9% were not comfortable pricking themselves, only half (n = 72, 46.4%) were not comfortable seeing others being pricked with a needle/lancet/injection/others.

After shortlisting the study population among whom Trypanophobia was seen, the degree of anxiety experienced by them was assessed using the standard Injection Phobia Scale for Anxiety (IPS-Anx).[10,11] The results are documented in Table 2.

Items which involve actual contact of the needle with the person come under contact fear while distal fear includes situations where the

Table 1
Baseline Characteristics of the study population (N = 501).

Baseline characteristics	Total study population	
	Number	Percentage
Gender		
Male	179	35.7
Female	322	64.3
Course		
Bachelor of Medicine Bachelor of Surgery (MBBS)	385	76.8
Allied Health Sciences (AHS)	116	23.2
Nationality		
Indian	470	93.8
NRI	025	05.0
Others	006	01.2
Year of study		
I	220	43.9
II	187	37.3
III	067	13.4
IV	027	05.4

Table 2
Degree of anxiety seen in the population having Trypanophobia, based on the Injection Phobia Scale for Anxiety (N = 155).[10,11]

Questions	Median(IQR)
Items of Contact Fear	
1. Giving a blood sample by having a finger pricked	2 (1–3)
2. Having a shot in the upper arm	2 (1–3)
5. Having an anaesthetic injection at the dentist's	2 (1–4)
6. Having a venipuncture (needle inserted into vein)	3 (1–3)
8. Getting an injection in the buttock	2 (1–3)
15. Having one's ears pierced	2 (0–2)
16. Getting a vaccination	1 (0–2)
17. Getting an intravenous injection	2 (1–3)
Items of Distal fear	
3. Looking at a picture with a syringe and needle	0 (0–1)
4. Sensing the smell of a hospital	0 (0–1)
7. Watching another person having a venipuncture in reality	1 (0–2)
9. Looking at a picture of a person getting a shot	0 (0–1)
10. Listening to someone talking about injections	0 (0–1)
11. Looking at and touching veins in the crook of the arm	0 (0–1)
12. Watching a film about a person getting a shot	0 (0–1)
13. Watching another person getting a shot in reality	1 (0–2)
14. Watching a person in a nurse uniform	0 (0–0)
18. Watching another person having a finger pricked in reality	1 (0–2)

subject is a passive observer. The median and IQR (Inter Quartile Range) values of items associated with contact fear are higher as compared to the others that are related to the distal fear. The highest median value of 3 was seen for the item 'Having a venipuncture' while the highest IQR of 1–4 was seen for the item 'Having an anaesthetic injection at the dentist's'. Among the items on the list of contact fears, 'getting vaccinated' had the least median value. This indicates that as the degree of invasiveness of the procedure increases, the level of anxiety also increases in the population having Trypanophobia.

Apart from anxiety which was the principal symptom seen in the population having Trypanophobia when in stressful situations, multiple other symptoms like palpitations (n = 49, 31.6%), nausea (n = 112, 7.1%), sweaty hands (n = 31, 20%) and breathlessness (n = 13, 8.4%) were seen. Though anxiety was experienced by most (n = 100, 64.5%) students, dizziness was seen in minimum number (n = 8, 5.2%) of respondents.

The response to the fear was assessed and it was concluded that some students (n = 29, 18.8%) having Trypanophobia preferred avoiding medications and vaccines administered in the injectable form, many (n = 40, 26%) students having Trypanophobia averted from medical procedures including blood draws, getting anaesthesia etc. A good majority (n = 129, 83.8%) of the respondents were in favour of taking injectable medicines in oral forms. Though, when medical procedures involving needles are performed, a large proportion (n = 135, 87%) of students generally distract themselves from looking by talking to others and closing their eyes; some of them (n = 15, 9.7%) go for check ups but request the doctor not prescribe tests or procedures involving injections or needles and only a handful (n = 5, 3.2%) of students completely avoid going to hospitals, clinics and for routine check ups.

Table 3 provides information on the association of Trypanophobia with baseline characteristics. The percentage of female students having trypanophobia was higher (n = 115, 74.2%) and this was considered statistically significant ($P = 0.002$). The other baseline characteristics like the course and year of study, however, did not have any statistically significant association with the fear of needles.

4. Discussion

People today, have to be subjected to various therapeutic procedures involving needles. Moreover, the physicians and medical students performing these procedures have to be comfortable while performing them. According to a report released by the World Health Organization (WHO) in 2016, 16 billion injections are administered worldwide every

Table 3
Association of Trypanophobia with baseline characteristics (N = 501).

Baseline Characters	Trypanophobia		Total students	P value
	Yes N(%)	No N(%)		
GENDER				
Males	040 (25.8)	139 (40.2)	179	**0.002**
Females	115 (74.2)	207 (59.8)	322	
TOTAL	155	346	501	
COURSE				
MBBS	111 (71.6)	274 (79.2)	385	0.063
AHS	044 (28.4)	072 (20.8)	116	
TOTAL	155	346	501	
YEAR				
I	061 (39.4)	159 (46.0)	220	0.231
II	057 (36.8)	130 (37.6)	187	
III	027 (17.4)	040 (11.5)	067	
IV	010 (06.4)	017 (04.9)	027	
TOTAL	155	346	501	

year.[12] Out of these, the majority is for curative purposes and only 5% is for immunizations. Blood transfusions, collections and other procedures constitute another 5%. But, like a 2021 study rightly points out, avoidance of common medical, surgical as well as immunization procedures leading to life threatening situations may be seen in patients having needle phobia.[13]

With its mention in the latest edition of the Diagnostic Manual of mental disorders,[14] fear of needles has contributed to vaccine hesitancy in numerous ways.[15] In association with the vaccine hesitance and other procedures like blood draws and donations, more than half the subjects in our study, were of the opinion that medical students should not be afraid of needles. A 2018 study conducted among medical students in North India has shown a positive correlation between trypanophobia and unwillingness to donate blood. The study detailed that 91% of the participants appreciated and encouraged people, strongly believing that they should actively participate in blood donations. Moreover, they were themselves enthusiastic about donating blood. The same study also reported that 12.2% of the students unwilling to donate blood felt so due to their fear of needles.[16]

Though, not many studies have been conducted on Trypanophobia keeping medical students in mind, needle phobia was found to be present in 22.2% adolescents[17] and 22% of the adult population[18] in various other studies and 30.9% in our study population. Similar to our study where 74.2% of the population having needle phobia was females, many researchers have shown evidence associating gender with Trypanophobia where females are more susceptible to developing the fear of needles.[18–24] Contrary to these results, a study conducted on medicine and pharmacy students in Serbia,[6] established no such relation between gender and needle phobia. However, in line with our findings, the study did emphasize the higher percentage of needle phobia seen in pharmacy students due to less exposure in comparison with students studying medicine. Our study findings indicated that 37.9% Allied Health Science students had trypanophobia as compared to 28.8% MBBS students.

Anxiety though was the main symptom seen in majority of the study population, fainting due to a vasovagal response was not seen in many. Jenkins further confirmed that 25% of the people fearing needles, when subjected to medical procedures involving them did not experience any fainting pattern which may be because of a genetic predisposition to a lower or absent vasovagal response.[25] The anxiety in the population was measured by the Injection Phobia Scale for Anxiety and corresponding to the further study on the Injection Phobia Scale for anxiety,[10,11] our findings also highlighted a higher median score of anxiety seen in cases of contact fear (eg – having a venepuncture) than in those of distal fear (eg – seeing someone get injected).

There have been several studies that aim to determine the predisposing factors for trypanophobia. A 2010 study in North America observed a familial association[4] while history of traumatic experiences was noted by some researchers.[22] Further, in 2001, researchers from the

Mayo Clinic studied that nearly 80% needle phobics had first degree relations with people who exhibited a similar fear. The findings of our study did not show any distinct predisposition on any of these factors.[26]

Among the coping mechanisms, distracting oneself while getting an injection was seen in 87%, but there were still some (3.3%) who avoided going to clinics for routine check ups. Studies performed by Sokolowski et al. (2010) also suggest that avoidance behaviour may be seen in people who have a fear of needles involved in different procedures. A 2018 review article also estimated that 16% of adults and 27% of hospital employees avoided the influenza vaccine due to their fear of injections and needles.[3] Distraction may be another manner of coping.[27,28] Our analysis of the coping mechanisms revealed that avoidance was only seen in 13% needle phobics while 87% preferred distraction.

Many researchers are in favour of exposure based desensitization against needle phobia.[5,29,30] These techniques may prove beneficial especially in medical students and afford them ease in procedures associated with needles, such as administering injections, drawing and donating blood, getting vaccinated etc.

To conclude, the study highlights the proportion of medical students who have Trypanophobia and are afraid of procedures involving needles in the medical setting. More than one quarter of the respondents (31%) had Trypanophobia out of which majority were females. It was observed that the degree of anxiety experienced by the students who had Trypanophobia increased with the increase in the invasiveness of the procedure. Moreover, anxiety was the common symptom experienced by most, in situations involving needles. The fear, though may stem from previous traumatic experiences or psychological factors, can be contained with repeated exposure and counselling. For medical students, the clinical exposure from early on in the career plays an important role in eliminating stress, anxiety and hesitance while using and performing medical procedures which require an active use of needles. Constant counselling from the support network may prove useful in cases which cannot be managed with persistent exposure in order to improve patient care and also to ensure safety and self satisfaction of the future healthcare professionals. Though this study is one of the first of its kind in the Indian setting, more detailed analytic methods may be employed to assess the pattern of Trypanophobia and associated risk factors among health professionals and medical students.

Ethical consideration

The study was approved by the Institutional Ethics Committee of Kasturba Medical College, Mangalore.

Ethics approval

This study was approved by the Institutional Ethics Committee. The authors declare that all procedures performed in this study abide by the ethical standards of the institutional research committee.

Funding statement

This study did not receive any grant or funding from any financial body.

Consent to participate

A written informed consent was obtained from all the participants after explaining the objectives of the study.

Availability of data and material

The data that support the findings of this study can be shared upon request.

Code availability

Not applicable.

Declaration of competing interest

The authors declare that they have no conflicts of interest.

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