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Awareness, Perception, and Application of Aviation Motion Sickness among Physiotherapy Students: A Cross-sectional Correlational Study

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ABSTRACT

Purpose: This study aimed to examine the association between academic year and awareness, perception, and application of aviation motion sickness (AMS) among physiotherapy students.
Methods: A cross-sectional observational study was conducted among 128 physiotherapy students from a single institution in India using a validated questionnaire. The survey captured demographic characteristics, prior experience with motion sickness, awareness of AMS, and perception of its relevance in physiotherapy. Descriptive statistics, Chi-square tests, and Spearman's rank correlation were used to assess the data.
Results: Awareness of AMS was low (42.19%), with no significant association between academic year and awareness ($p = .567$). However, a significant positive correlation was found between the academic year and interest in AMS specialization ($\rho = 0.18$, $p = 0.048$). While 40.32% supported physiotherapy for AMS, specific techniques like balance training (22.13%) and gaze stabilization (13.11%) were moderately recognized. A majority of students (90.63%) expressed a desire to learn more, and 73.17% supported the inclusion of the curriculum.
Conclusion: Despite limited awareness, interest in AMS specialization increases with academic progression. Integrating AMS content into physiotherapy curricula may enhance preparedness and interdisciplinary competence.

Keywords: Aviation Motion Sickness; Physiotherapy; Vestibular Rehabilitation; Education, Perception

INTRODUCTION

Aviation Motion Sickness (AMS) is a form of motion sickness that occurs due to conflicting sensory inputs during flight, particularly involving the vestibular, visual, and proprioceptive systems. Symptoms commonly include nausea, dizziness, vomiting, and postural instability, which may impair performance and safety in aviation contexts.[1,2]

Physiotherapists play a key role in vestibular rehabilitation and balance retraining—interventions that have shown promise in managing motion-related disorders.[3,4] However, the extent of awareness, perception, and readiness among physiotherapy students to address AMS is not well-documented, particularly in India.

Objectives

This study aims to evaluate the association between academic year and students' awareness, perception, and application of AMS. The findings may inform curriculum development to bridge gaps in interdisciplinary training and enhance future clinical competencies.

Hypotheses

Null Hypotheses (H_0):

1. There is no significant association between academic year and awareness of Aviation Motion Sickness among physiotherapy students.
2. There is no significant correlation between academic year and interest in specializing in AMS.

Alternative Hypotheses (H_1):

1. There is a significant association between academic year and awareness of Aviation Motion Sickness among physiotherapy students.
2. There is a significant positive correlation between academic year and interest in AMS specialization.

MATERIALS & METHODS

A descriptive cross-sectional study was conducted using a structured and validated questionnaire. The sample included 128 physiotherapy students enrolled across all years of study at a single institution in India. The survey collected data on demographic characteristics, motion sickness experience, awareness of AMS, perceived causes and symptoms, and views on physiotherapy's role in AMS management.

STATISTICAL ANALYSIS

Data were analyzed using IBM SPSS version 23. Descriptive statistics (frequencies and percentages) summarized responses. Chi-square tests assessed associations between academic year and awareness, while Spearman's correlation examined the relationship between academic progression and interest in AMS specialization.

RESULT

Among the 128 physiotherapy students who participated, the majority (58.59%) were aged between 21–23 years, followed by 39.06% aged 18–20 years and only 2.34% aged 24 or older (Table 1).

Table 1. Age Distribution of Participants

Age Group	Number (n)	Percentage (%)
18–20	50	39.06
21–23	75	58.59
24+	3	2.34

This table presents the age categories of the 128 respondents. The majority were between 21–23 years, indicating a predominantly mid-program student demographic.

Most participants were 4th-year students (32.03%), followed by 2nd-year (19.53%), interns (15.63%), and 3rd-year students (17.19%) (Table 2).

Table 2. Academic Year of Respondents

Academic Year	Number (n)	Percentage (%)
1st Year	13	10.16
2nd Year	25	19.53
3rd Year	22	17.19
4th Year	41	32.03
Interns	20	15.63

The table shows the distribution of participants based on their academic year. Most were final-year students or interns, which may have influenced their awareness and interest in advanced topics such as AMS.

Regarding experience with motion sickness, 71.88% of respondents reported having previously experienced motion sickness,

with road travel being the most common trigger (84.21%), followed by sea (13.68%) and air travel (11.58%) (Table 3). Only 9.02% had experienced symptoms similar to motion sickness during physiotherapy-related activities.

Table 3. Situations Triggering Motion Sickness

Situation	Number (n)	Percentage (%)
Road Travel	77	84.21
Sea Travel	12	13.68
Air Travel	11	11.58
Amusement Park Rides	9	9.47
Virtual Reality Exposure	6	6.32

This table lists the contexts in which motion sickness was experienced among those reporting it. Road travel was the most common trigger, with lesser prevalence for sea and air travel or virtual reality exposure.

Awareness levels were relatively low: 57.81% had not heard of Aviation Motion Sickness (AMS), and 55.47% had not studied vestibular rehabilitation or motion sickness-related topics during their academic training (Table 4).

Table 4. Awareness and Training

Variable	Number (n)	Percentage (%)
Heard of AMS	54	42.19
Not heard of AMS	74	57.81
Studied Vestibular Rehab/Motion Sickness	57	44.53
Not Studied	71	55.47

This table summarizes participants' awareness of AMS and their academic exposure to related topics, such as motion sickness and vestibular rehabilitation. Over half of the participants lacked prior exposure or training.

Among those aware, vestibular dysfunctions (55.47%) and gravity-related changes (44.53%) were the most commonly reported perceived causes. Nausea (54.84%), vomiting (51.61%), and dizziness (42.74%) were the most commonly identified symptoms associated with AMS (Table 5).

Table 5. AMS Causes and Symptoms

Category	Item	Number (n)	Percentage (%)
Causes	Vestibular Dysfunction	71	55.47
	Gravity Changes	57	44.53
Symptoms	Nausea	70	54.84
	Vomiting	66	51.61
	Dizziness	55	42.74

This table categorizes students' understanding of perceived causes and symptoms of AMS. Vestibular dysfunction and gravity changes were the most cited causes, while nausea, vomiting, and dizziness were the most recognized symptoms.

In terms of perception, 74.22% of participants felt that AMS is a significant concern requiring more research, and 90.63% expressed interest in learning more about its management. While 40.32% supported physiotherapy as a potential treatment approach, a slightly higher proportion (41.13%) endorsed medication as the preferred option. Among physiotherapy techniques, balance training (22.13%) and gaze stabilization exercises (13.11%) were most frequently mentioned (Table 6).

Table 6. Perception and Treatment Preferences

Item	Number (n)	Percentage (%)
AMS needs more research	95	74.22
Interested in learning about AMS	116	90.63
Support medication for AMS	54	41.13
Support physiotherapy for AMS	52	40.32
Mentioned Balance Training	28	22.13
Mentioned Gaze Stabilization	17	13.11

This table explores the participants' perceptions of AMS severity and their preferred management approaches. Most supported further research and education on AMS, with balanced support for both medication and physiotherapy.

Regarding education, only 28.69% believed that their training addresses AMS-related vestibular issues. A majority (73.17%) supported the inclusion of AMS content in the physiotherapy curriculum (Table 7).

Table 7. Curriculum and Training Views

Statement	Number (n)	Percentage (%)
AMS content should be included	94	73.17
Training addresses AMS	37	28.69
Unsure if training addresses AMS	49	38.52
Training does not address AMS	42	32.79

This table reflects participants' views on how well AMS is covered in their physiotherapy education and their support for curriculum enhancements. A majority favored introducing specific modules on AMS management.

When asked about specialization, 51.56% expressed interest in pursuing a specialization in aviation-related physiotherapy, while 42.19% were open to the idea (Table 8).

Table 8. Interest in Specialization

Response	Number (n)	Percentage (%)
Yes	66	51.56
Maybe	54	42.19
No	8	6.25

This table outlines participants' interest in specializing in aviation-related physiotherapy. Over half were willing to pursue it, and a substantial proportion were open to considering it in the future.

Statistical analysis using the Chi-square test revealed no significant association between academic year and AMS awareness (χ^2 (4, N = 128) = 2.94, p = 0.567). However, Spearman's rank correlation revealed a statistically significant positive correlation between the academic year and interest in specializing in AMS (ρ = 0.18, p = 0.048), indicating that students in higher academic years were more likely to express interest in aviation-related physiotherapy specialization.

DISCUSSION

Motion sickness is often the result of sensory conflict between the visual, vestibular, and proprioceptive systems, aligning with established theories of its pathophysiology.[5] Validated symptom assessment tools are essential to accurately capture the presence and severity of such symptoms.[6] This study reveals a considerable gap in awareness of Aviation Motion Sickness (AMS) among physiotherapy students, irrespective of their academic standing. The lack of a statistically significant association between academic year and AMS awareness suggests that the topic is insufficiently addressed within the current physiotherapy curriculum. However, the positive correlation between academic progression and interest in AMS specialization may indicate that students in advanced stages of their education develop greater clinical

maturity and openness to non-traditional fields of physiotherapy.

Notably, the strong interest expressed by students in learning more about AMS, alongside their support for integrating physiotherapy approaches into its management, underscores a critical educational and clinical opportunity. Participants identified key barriers such as limited awareness and the absence of structured training, factors that reinforce the need for targeted curricular reform. These findings are consistent with existing literature demonstrating that structured educational interventions can enhance student engagement and preparedness for specialized practice areas.[7] Given the clinical relevance of vestibular rehabilitation in AMS, the integration of simulation-based learning and interdisciplinary training modules could significantly enhance future physiotherapists' competence and readiness in managing AMS-related conditions [4,8]

CONCLUSION

Despite limited awareness of AMS across academic levels, students showed a strong desire to learn more and consider AMS as a physiotherapy specialization. Academic programs should consider incorporating dedicated content on aviation motion sickness and vestibular rehabilitation to improve student readiness and interest in aviation-related roles.

Declaration by Author

Ethical Approval: This study was a non-interventional, anonymous, questionnaire-based survey conducted among the investigator's students. Given the minimal risk involved, absence of any clinical intervention, and the non-sensitive nature of the data collected, formal ethical approval was not sought. However, all moral principles of voluntary participation, anonymity, and confidentiality were followed.

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Conflict of Interest: The author declares no conflict of interest.

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