

Correlations of Tolerance for Ambiguity to PBL Curriculum, Reduced Mental Health, and Stage of Training

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Introduction:

- Tolerance of ambiguity (TOA) relates to the capacity for which an individual can manage a situation that lacks information or a defined resolution.
- The ability for medical professionals to adequately manage their TOA is believed to be vital for physician longevity and patient care. Specifically, low rates of TOA have been correlated with increased physician stress, burnout and patient repeat tests.^{1,2}
- Studies also reported changes of an individual's TOA among pre-clinical medical students.^{3,4}

Objectives: We explored the following research questions:

- Is there association between TOA and students' mental health as some literature suggested?
- Do students at different levels of their medical training (MS I – III) demonstrate different levels of TOA?
- Do students in problem-based learning (PBL) have higher levels of TOA than those in lecture-based curriculum (SGL) because of the self-discovery nature of PBL?

Methods:

- The Multiple Stimulus Types Ambiguity Tolerance Scale-II (MSTAT-II) survey with two additional questions on mental health.⁵
- A total of 115 students at four different stage of training completed the survey during academic year of 2021-22.

Table 1. Correlations between TOA and Mental Health

	Anxiety, depression, or feeling irritable in the last month	Feeling burnt out last month
R	-0.26	-0.227
p-value	0.005*	0.014*

Higher tolerance for ambiguity (TOA) is associated with decreased level of anxiety and burnout

Table 2. Descriptive and ANOVA results of TOA Level at different Stages of Training

Cohort	Mean	SD.	Min.	Max.	F	P.
Class of 2026-Incoming OMS I	3.27	0.61	1.77	4.31	0.47	0.99
Class of 2025- End of OMS I	3.24	0.45	2.46	4.23		
Class of 2024- OMS II	3.30	0.71	1.92	4.85		
Class of 2023- End of OMS III	3.30	0.47	2.46	4.08		
Total	3.28	0.58	1.77	4.85		

PBL students reported higher levels of TOA than students in the lecture-based curriculum.

Table 3. Comparison of TOA levels between PBL and SGL students (all four cohorts)

	PBL (N=22)	SGL (N=84)	t	p.
Mean	3.62	3.20	3.08	0.003*
SD.	0.52	0.58		

*significant at $\alpha < .05$ in all tables.



Results:

- ❖ (Table 1) Students with lower TOA had higher levels of both anxiety and burnout within the past month.
- ❖ (Table 2) No statistically significant difference or any specific pattern in TOA levels among the four cohorts of students from different stages of their medical training.
- ❖ (Table 3) There is a significant difference in the level of TOA between PBL and SGL.

Discussion and Conclusion:

- Our preliminary results confirmed the findings in the literature that students' TOA level is associated with their mental health.
- Different curricular styles may render the differences in students' TOA, or those with higher TOA level may have self-selected into the PBL curriculum. Future interventions could be drawn from the designs of PBL curriculum to help improve students' level of TOA or vice versa.
- More data are needed to further explore TOA difference among students from different stages of training due to the small sample sizes of the current study.

Citations:

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5. NcLain DL. Evidence of the Properties of an Ambiguity Tolerance Measure: the Multiple Stimulus Types Ambiguity Tolerance Scale-II (MSTAT-II). Psych Rep. 2009; 105: 975-988.