The determinants of medical student learning behavior that are associated with the outcome of the Indonesia Medical Doctor National Competency Examination: A review

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ABSTRACT

Indonesia has implemented a National Competency Examination for medical graduates since 2014 called the Indonesian Doctors National Competency Examination (IMDNCE). The first component of the exam is multiple choice-based questions that use computer-based testing method (MCQs-CBT) to assess the candidate’s knowledge. The second component is Objective Structured Clinical Examinations (OSCE) to assess the performance of the candidate’s clinical skills. The IMDNCE pass rate has never reached 100% because, in each exam period, 16-32% of examinees fail. CBT passes are also always lower than OSCE passes, and IMDNCE retakers mostly repeat CBT. The literature explaining the determinants of learning behavior and passing national exams is still limited. This study aims to identify the determinants of medical students’ learning behavior in the national medical competency exam and their relationship to graduation outcomes. Learning behavior consists of two categories: the quality of learning and learning regulation. The conclusion is the determinant factors consist of internal and external factors. Internal factors include learning motivation and academic achievement, anxiety, and health conditions facing exams. External factors include environmental factors such as tutoring, family and peer support. These factors determine the learning behavior of medical students in the national medical competency exam in Indonesia, both in terms of quality and learning regulations.

Keywords: determinant factor, Indonesian Medical Doctor National Competency Examination (IMDNCE), learning behavior, outcome.

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INTRODUCTION

National medical competency tests have been carried out in many countries worldwide to ensure that the competence of medical graduates can meet the required minimum standards. Indonesia has carried out a national medical competency exam known as the Indonesian Doctors National Competency Examination (IMDNCE) since 2014 based on Indonesian Medical Law No. 20/2013, which consists of two components. The first component of the exam is multiple choice-based questions that use computer-based testing methods (MCQs-CBT) to assess the candidate’s knowledge, and the second component is Objective Structured Clinical Examinations (OSCE) to assess the performance of the candidate’s clinical skills.\(^1,2\) According to the Indonesian Doctors Competency Examination Division, the number of questions tested was 200, consisting of 150 questions for the competency test and 50 pretest questions or pilot items for statistical data collection and were not counted as participant scores. MCQ questions are made in the form of scenarios or Vignettes. There are errors in the structure of the questions that must be avoided because they lead to two things, namely, test-wiseness and irrelevant difficulty. Test-wiseness is a situation where examinees can answer questions not because of mastery of the material’s content but because of their intelligence in guessing the questions. At the same time, irrelevant difficulties are related to the participants’ difficulties in answering the questions, not because of the difficulty of the material but in the form of difficulties caused by the structure of the questions, such as grammatical cues, convergence questions, multiple interpretations, as well as answer choices and questions that are too long and complex. Then, the distractor (wrong answer option) should consist of choices with homogeneous problems that make sense, shape and length that resemble the correct answer but differ from the right answer.\(^3\)

The IMDNCE pass rate has never reached 100% because in each exam period, 16-32% of examinees fail.\(^4\) CBT passes are also always lower than OSCE passes, and IMDNCE retakers mostly repeat CBT.\(^5\) To successfully graduate from IMDNCE, medical students usually undergo 1-3 months of the exam preparation stage. At this stage, students usually join courses in groups or private classes. This condition follows previous studies which explain that one of the...
external factors that influence IMDNCE graduation are proper tutoring, family factors, peer factors and the learning environment. In addition, internal factors that influence are academic abilities and skills, learning motivation, student health and self-confidence. The internal factor that is considered to play a role in medical education, including in preparation for taking IMDNCE, is self-regulation, which is also called self-regulated learning. The principle of self-regulated learning is that students become regulators in their learning. The three main elements involved in self-regulated learning are metacognition in self-regulated learning, motivation and behavior. These three things will form the characteristics of a student with strong motivation and various learning strategies to achieve his goals. Therefore, this article aims to review the determinants of learning behavior that can influence IDNCE readiness and outcomes.

METHOD

Type of review
This type of study is a literature review that uses the literature study method. The literature search was carried out for 3 months, from January to March 2023.

Literature Search
The sources used in this review consist of relevant journals from search engines such as Pubmed, Google Scholar, ScienceDirect, and Cochrane Library. Journal searches used Boolean terms (AND, OR, NOT). The author uses journals that only focus or do not contain information relevant to the topic of the study. Forty-nine journals were reviewed, 40 of which met the criteria as references for this review.

Inclusion and Exclusion Criteria
The inclusion criteria in this review are paid or not free journals and do not contain information relevant to the topic of the study. Forty-nine journals were reviewed, 40 of which met the criteria as references for this review.

RESULT & DISCUSSION

External Factors (Courses)
One of the efforts to increase IMDNCE graduation is by holding pre-IMDNC courses. The pre-IMDNC tutoring provides material guidance for facing the CBT and OSCE IMDNCE exams. The existence of pre-IMDNC tutoring is expected to increase students’ knowledge and abilities to work on the IMDNCE CBT exam questions. In addition, tutoring also aims to overcome the problems and difficulties of IMDNCE participants in analyzing questions. The results of research conducted by Sahara (2019) at the Faculty of Medicine, University of Malang, regarding the effect of pre-IMDNC tutoring on IMDNCE CBT Pass Rates for Medical Faculty Students, concluded that there was an effect of tutoring on passing IMDNCE CBT.

Other research shows that the IMDNCE preparation online tutoring model is felt very well by 68% of students. Student interactions with institutions, communication, and organizing activities are aspects of satisfaction that get a high enough score. Students think that tutoring is necessary to know tricks in answering questions. Tutoring makes students know their abilities and learn more focused and prepared to participate in IMDNCE CBT. It was concluded that tutoring has significant results for passing IMDNCE CBT.

Research by AlQhtani et al. states that online learning can help the teaching process but not in all aspects of learning. Several parameters that show higher effectiveness or equivalent to learning in the classroom are assignments, obedience, and fulfillment of individual learning needs. Johnson’s research shows that students who use online preparation modules score higher on the final exam than those who do not. Students who prepare themselves by taking additional tutoring online score significantly higher (p<0.002) than students who do not take tutoring.

External Factors (Family and Peer Support)
A study involving 106 college students found that family and peer support did not significantly correlate with exam preparation or graduation (p = 0.804 and p = 1,000). However, in theory, family and peer support impacts students’ mental state in exam preparation. Family and parental support are one of the psychological needs of children entering their teens; if these needs are not met, it will result in a person not having the motivation to learn. This follows the theory which explains that achievement factors in learning outcomes are influenced by two factors, namely internal factors and external factors. Internal factors come from within the student: psychological factors (intelligence, attitude, talent, interest, and motivation) and physiological factors (illness or disability). External factors come from outside the student’s self, including the social environment (parents/family). The family environment in question is how parents can positively or negatively impact learning activities and student learning outcomes.

Peers are a component often associated with a teenager’s achievement. Peer groups are a source of affection, sympathy, understanding, and moral guidance, a place for experimentation, and a setting for gaining autonomy and independence from parents. Some of the benefits obtained from peer support are (1) the feelings experienced by students so that they will tend to talk about the problems they experience openly. (2) Build individual motivation because peer reflection helps students identify their strengths and weaknesses from the perspective of others. In addition, students are also required to reflect on their friends, which in turn impacts them as reflectors. (3) Peer support not only builds students’ enthusiasm to pass the national exam but also gives them the confidence to pursue their profession after graduation.
Internal Factors (Learning Motivation)
Motivation to learn is the overall driving force within oneself that gives rise to learning activities, which guarantees the continuity of learning activities and directs learning activities so that the desired goals can be achieved. Motivation to learn includes persistence in learning, tenacity in the face of difficulties, interest and sharp attention in learning, achievement in learning, and independence in learning. The analysis shows a relationship between learning motivation and passing the IMDNCE CBT exam for medical students in Aceh Province for February 2021, with a p-value of <0.001. It can be seen that 95.31% of students with high learning motivation are declared to have passed the CBT exam, while students with low learning motivation, around 93.62%, have not passed the CBT exam. The results of research by Wouters et al. (2016) suggest that self-motivation is proven to have a relationship with academic performance, and that can impact student graduation outcomes. The higher the students’ motivation to face exams, the higher the chances of successful learning produced. Learning outcomes are influenced by non-intellective factors, including learning motivation. Motivation is a deep learning approach strategy. The learning approach consists of two approaches: the deep approach and the surface approach. The results show a relationship between learning approaches and learning outcomes, with the deep approach being 96.7%. The learning approach applied by students is influenced by student motivation and the learning environment. Students with a deep approach have a higher graduation rate than students with a surface approach.

In another study with 60 samples, the results showed that learning motivation was in the medium category (5%) and the low category (12%), as well as in the high category (83%). As many as 85% of students pass, while 15% do not pass. Based on the Chi-Square test, a P value of <0.001 was obtained, which meant that there was a correlation between learning motivation and IMDNCE CBT graduation for students of the Faculty of Medicine, Islamic University of Malang, February and May 2019. These results are following previous research conducted by Putri (2018) at the Faculty of Medicine, University of Lampung, namely that there is a significant relationship between high learning motivation and passing the IMDNCE CBT exam with a p-value = 0.003. Research by Lijun (2011) states that motivation is positively related to strategy and achievement of learning outcomes. Research by Yu (2012) also states that there is a relationship between motivation and learning strategies with a high chance of graduation.

There are several principles of adult learning in students, namely the existence of knowledge to learn, learning concepts, previous learning experiences, readiness to learn, learning orientation, and learning motivation. The maximum results of the learning process can be seen if a person has the characteristics of motivation, namely being diligent in facing tasks, not giving up easily, showing a high interest in learning, and being independent, thorough and critical in solving problems. Based on the cumulative GPA data, it was found that the high motivation was in the very satisfying predicate. According to Slameto (2013), the theory factors that influence learning outcomes on exams include internal factors in the form of physical factors, psychological factors (intelligence, attention, interests and talents, motivation, maturity and readiness to learn), and physical and spiritual fatigue factors. Meanwhile, external factors are family, educational, and community factors.

Internal Factors (Academic Achievement / cumulative grade point average)
Another factor that has an impact on learning motivation that has an impact on passing exams is the cumulative grade point average (GPA). Tanzila and Zalika (2017), in their research, found that there was a significant correlation between cumulative GPA and passed IMDNCE with a p-value = 0.008. Academic achievement is the result obtained as the result of learning activities. Academic achievement is evidence of improvement or achievement obtained by a student as a statement of whether there is progress or success in an educational program. The value obtained is in the form of a certain number or symbol so that students themselves will be able to know the extent of academic achievement that has been achieved. Another study found that the higher the cumulative GPA, the higher the motivation to study and the chances of passing IMDNCE (p=0.034; OR=3.29). Another study also found a strong correlation between GPA and IMDNCE passing grades (p<0.001, r=0.625). This aligns with Sandra E Carr’s research (2014), which shows a significant correlation between GPA and Junior Doctor performance in medical practice. This correlation is seen in clinical management skills and communication skills.

Several studies have shown a correlation between undergraduate and professional academic ability on IMDNCE CBT performance. The correlation between academic knowledge at the undergraduate level is stronger than the correlation between professional-level academic ability on IMDNCE CBT performance. This is because the assessment of the undergraduate stage module is more like the CBT IMDNCE assessment, while the undergraduate stage focuses more on performance assessment or psychomotor aspects. Students with poor academic achievement during clinical stages also risk failing to pass IMDNCE. Interviews conducted with the education coordinator at the hospital providing professional education explained that students who were less active during the clinical stage and less motivated to study independently tended to fail the IMDNCE CBT exam. This is supported by the results of a systematic review conducted by Rosenthal et al., which showed that students with a low clinical GPA are at greater risk of failing the national competency exam.

CONCLUSION
Study behavior is very important in determining IMDNCE graduation in medical students. Several factors influence the learning behavior of medical students in passing IMDNCE, which are classified into internal and external factors. Internal factors include learning motivation, academic achievement, anxiety, and health conditions facing exams. External factors include environmental factors such as tutoring, family and peer support.
AUTHOR CONTRIBUTION
All authors have contributed to this research process, including conception, design, collection and assembly of data, analysis and interpretation of the data, drafting of the article, and critical revision of this manuscript.

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Not applicable.

REFERENCE
REVIEW


