Nugraheni ES, et al., JPKI, 2022;11(2): 160-170
doi: 10.22146/jpki.67697

ORIGINAL RESEARCH

DO AUTONOMY SUPPORTS IMPROVE MEDICAL STUDENTS' MOTIVATION IN A DEVELOPING COUNTRY?

Elizabeth Sulastri Nugraheni[1*], Doni Widyandana[2], Rachmadya Nur Hidayah[2]
[1]Medical Education Unit, Faculty of Medicine, Universitas Ciputra, Surabaya – INDONESIA
[2]Departement of Medical Education and Bioethics, Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada, Yogyakarta – INDONESIA

Submitted: 04 Jul 2021, Final revision from authors: 11 Apr 2022, Accepted: 12 Apr 2022

ABSTRACT

Background: Medical students in private schools are mostly high school graduates, ages are around 17 to 18. They were so diverse, the background of the former school, culture, motivation, and study skills. Students from rural might have different motivation and study skills from students of big cities. To give autonomy support to the new medical students, we planned the motivational workshop and study skills mentoring. We assume those will increase their motivation.

Aims: To know - What types of motivation do first-year medical students have? Secondly, to evaluate - Whether motivational workshops and mentoring about study strategies can help to increase students' autonomous motivation based on the Self-Determination Theory.

Methods: A mixed-methods research was conducted in this study. The first step was the quantitative study using the Academic Motivation Scale (AMS) to measure the students' pre and post intervention motivation and the Intrinsic Motivation Inventory (IMI) post intervention, then followed by the qualitative study to capture students' responses and reflections with convenience sample.

Results: The autonomous motivation was high among the male students, home-schooling, does not belong to medical profession family, and students from lower middle income. Quantitative data showed that this approach significantly decreased the amotivation scale of participants ($p=0.025$). Descriptively, there was an increase in the autonomous motivation of participants after following motivational workshop and study strategies mentoring.

Conclusion: Motivational workshops and mentoring on study strategies were found to be valuable, interesting, and facilitate autonomous motivation. Results showed that those activities increased the students' autonomous motivation.

Keywords: motivation, autonomous motivation, Self-Determination Theory, autonomy support, study strategies, Learning and Study Strategies Inventory

*corresponding author, contact: elizabeth.sulastri@ciputra.ac.id

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PRACTICE POINTS

- Autonomy support activities involving mentoring in study skills and motivational workshops could be one solution to tackle the diversity of new medical students start their learning journey.
- Study skills mentoring and motivational sessions give benefits to the new medical students to increase their autonomous motivation.
- Introducing study strategies and discussion about motivation to new medical student can be applied in the orientation week and continuously evaluated and discussed with their academic advisor.

INTRODUCTION

Motivation plays an important role in the success of students studying medicine. Motivation will allow someone to act, including students making their decision to study.[1] There are many types of motivation that can cause a person to choose to study medicine, for example, their own desires[2,3] or because they want to become rich or respected, or fulfilling their parents' wishes.[2,3] As a result, they become medical students. It is important to know the motivation behind students' decision to study so that institutions can provide the support to enable them to be intrinsically motivated to study autonomously from within themselves.[1,4,5] The process to study medicine is hard and full of challenges. This is due to the many basic medical sciences that should be mastered, and the practical application of those skills and knowledge in clinical practice.[6] Accordingly, self-motivation is an important necessity to gain success.[7]

In developing country such as Indonesia, the high school graduates, start to study medical professional science without any adaptations.[6,8] Our students come from different types of schools, such as public or private schools, and there are even homeschooled high school graduates too. Nurrokhmanti in her research found that educational experiences also have significant influence in study skills and will affect the students' motivation.[9] The educational background of the students will directly and indirectly correlate with their study skills and self-directed ability and motivation.[9]

With this background, as autonomy supports for the new medical students, we provided mentoring about learning skills and a motivational session was conducted by a senior psychologist. Based on the Self-Determination Theory, the goal of these learning activities was to provide support for autonomy, competence, and relatedness which are the three basic psychological needs that must be satisfied to promote voluntary intrinsic motivation.[4,7] In order to encourage students to be autonomously motivated, institutions should introduce learning strategies that are appropriate to each student, especially in the increasingly fast and ever-changing world.[6,8]

Currently, studies in developing countries about autonomy support by introducing self-motivated learning strategies for medical students are few, especially for first-year undergraduate students.

Self-Determination Theory

The Self-Determination Theory (SDT) was introduced by Ryan and Deci. SDT is a motivational theory that identified different types of motivation. Motivation can be categorized in controlled or autonomous motivation. The higher quality of motivation is the autonomous motivation which can be from intrinsic motivation or from extrinsic motivation that has been internalized by someone. The internalization process could be facilitated with what are termed in this research as autonomy supports.[1,10] Controlled motivation is when a student acts based on specific contingencies such as rewards or to avoid punishment. In contrast, when a student finds something that is interesting and valuable for themselves, they will voluntarily act and this is called autonomous motivation. To be able to ensure students' autonomous motivation, the internalization process is essential.[1,11] In order to

achieve autonomous motivation, there are three basic psychological needs that should be fulfilled in every student. These involve the fulfillment of autonomy, competence, and relatedness.[1] Teachers play an important role in providing appropriate autonomy supports that can facilitate the formation of this autonomous motivation. Ten Cate gave guidance on how the SDT could assist teaching and learning processes in medical schools. Among several types of motivation, Nurrokhmanti in her study found that intrinsic motivation has an important role in the learning process and academic performance.[9] Ashaeryanto in his study compared the student selection, motivation and strategies of learning toward student performance.[12] Reynolds mentioned that students need to do a reflection of their learning strategies in order to enhance the motivation.[13] These learning strategies skills are important because they will have to become a lifelong learner. One of the self-reflection tools of these learning strategies is by using the Learning and Study Strategies Inventory (LASSI) questionnaire.13 Based on the theory and several studies, we aimed to support students' psychological basic need by providing the motivational workshop and mentoring in study strategies based on results of the LASSI questionnaire.

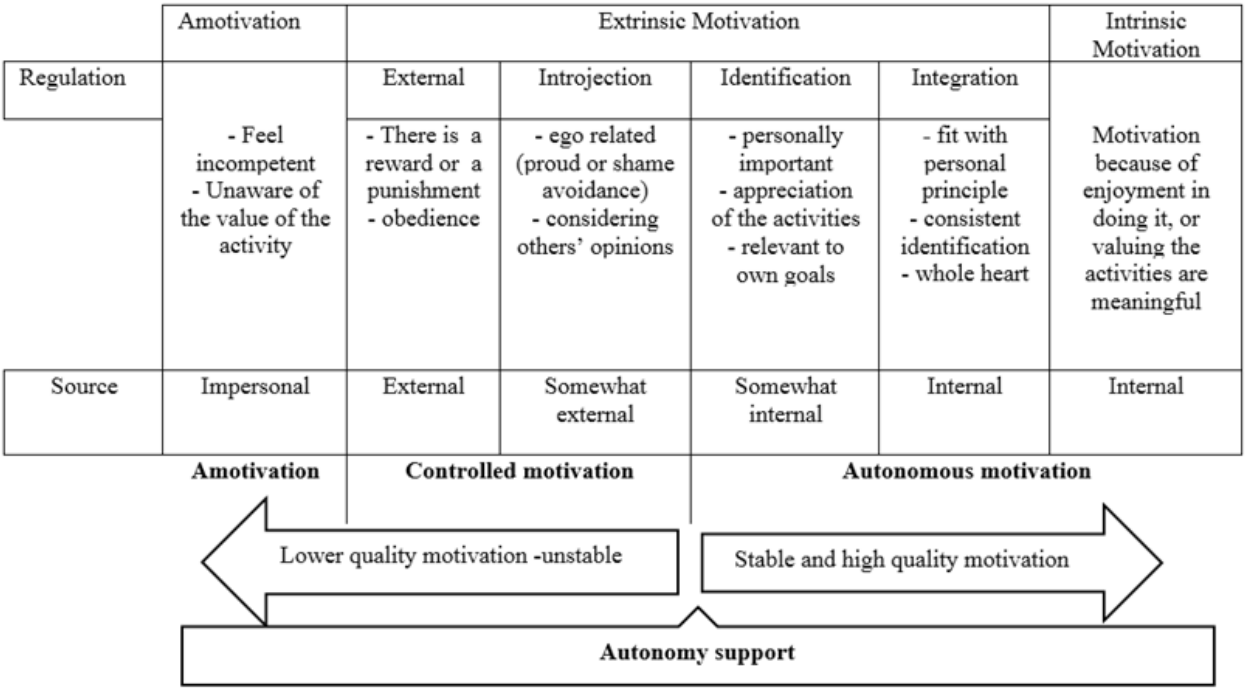

Figure 1. The Motivation Continuum

Teharian and Sekarchian explained autonomy support involves providing mentoring about the meaning of the medical profession, where hopefully students are motivated and able to interpret these learning activities as their own intrinsic motivation.[11] Isik conducted research about study strategies among the minority medical students.[14] Schutte et al. introduced the early exposure to the patient for students and the study showed that the activities were able to make students more autonomously motivated and more likely to achieve the expected competencies.[15] Feri et al. explained that autonomous motivation and supports are essential, and that tutors' autonomy support alone is inconsistent with students' academic achievement.[16] Considering the new medical students are all the fresh graduates of high school and mostly are below 20 years of age which based on Nurrokhmanti study have low Self Directed Learning.[9] Therefore, in this research, the motivational workshop and study strategies mentoring were conducted as an autonomy support for the students' learning

experience. The purpose of this intervention study was to know the benefits of autonomy supports for improving students' autonomous motivation. Therefore, two research questions helped to navigate this study: (a) What types of motivation do first-year medical students have? and (b) Do motivational workshops and mentoring about study strategies help to increase the autonomous motivation based on the Self-Determination Theory.

METHODS

Study Design and Setting

This study used the mixed-methods approach. The subjects of the study were the first-year students of school of medicine of the Universitas Ciputra. A validated and reliable Academic Motivation Scale (AMS) questionnaire was distributed after the study protocol received ethical approval. The quantitative phase was conducted first, then followed with the interviews of participants to obtain the qualitative data.

Quantitative data were collected using two validated questionnaires: the first one is the Indonesian version of the AMS from Vallerand[17] and the other is the Intrinsic Motivation Inventory (IMI) questionnaire.[18,19] The Indonesian version of the AMS questionnaire consists of 30 questions and 7 subscales. The IMI questionnaire[20] aims to measure the interest, value, and perceived choices of the autonomy support activities. Then, the EMID subscale and IM subscale were measured to know the changes in students' autonomous motivation. The AMS questionnaire was done twice, called as the pre and post intervention. The IMI questionnaire was only done as the post-test. After students completed the questionnaire, then they did the online LASSI questionnaire from Weinstein[21] as a baseline and to help in guiding the learning strategies mentoring classes. Accordingly, the LASSI questionnaire played role as a diagnostic tool about students' study strategies.

This study used a total sampling scheme. A total of 33 out of 36 students agreed to participate and signed the informed consent forms before completing the questionnaires. All participants were between the ages of 17 to 22, and 61% of them were female (n=33). After the first-year students completed the questionnaire, then the participants were trained in a motivational workshop and provided learning strategies mentoring classes for three months as the autonomy support activities. During the three-months study, the number of students who completed all 3 sessions provided (motivational workshop, and two mentoring sessions) were 15 students, and they were all willing to do the AMS and IMI questionnaire. The students who attended the three sessions were considered as the intervention group and the rest were considered as the control group.

The qualitative data were collected by convenience sampling, and collected until data were saturated. There were 11 students out of 15 students who were includedin the intervention group and 11 out of 18 students from the control group. In total there were 22 students who were interviewed. Interviews were conducted face by face by the researcher using guiding questions. The interview process took around 10 minutes for each student. Interviews were recorded, then transcripted verbatim, and then the researcher check the content again and the transcriptions were coded by two different coder and themes were obtain after that by content descriptive analysis.

Procedures

When the participants were gathered together, the researcher explained the aims and the research procedures, and then asked those willing to join the research to complete the informed consent forms. The participants who signed the inform consent forms then did the online LASSI after they were given a specific keycode to access the questionnaire. The researcher examined the LASSI feedback then discussed any concerns with the team of psychologists who would be the mentors for the students' learning strategies mentoring class. As a result, we agreed to equip the participants with the same modules. But to maximize the intervention, they were divided into three smaller groups with one psychologist as each group's mentor. The ethical approval for the study protocol was granted by the Medical and Health Research Ethics Committee of the University of Gadjah Mada, Yogyakarta, Indonesia with number: KE/FK/1347/EC/2019.

In order to promote students to be intrinsically motivated to study, the motivational session was designed to allow the first-year students to reflect on their motivation and what were their strengths and weaknesses. Additionally, as support to the three basic psychological needs, we provided mentoring sessions about learning strategies with the educational specialists. Mentors assisted the students in the learning strategies based on the feedback participants got from the LASSI questionnaires they did. Based on the feedback, most participants were suggested to improve their study skills in the ten core components of LASSI. Therefore, two separate mentoring sessions were arranged after the motivational workshop. Three educational experts taught and gave mentorship. In-depth interviewing was based on the four open-ended guidance questions about what was the students' motivation to study medicine, how did their motivation impact the current approach of their medical study, were those activities useful for their future learning, and how did the activities impact on their motivation. The interviews were done until data saturation was achieved.

Data analysis

Quantitative data collection was checked, then processed using SPSS 25 (IBM Corp., Chicago). Next, data were analyzed to measure the means, standard deviation (SD) and finally used for multiple linear regression analysis. Multiple linear regression analysis was done to explore the relationship of the autonomous support activities and those variables that had influence on the participants' autonomous motivation. All interview sessions were audio recorded, then transcribed verbatim. Next, the researcher did member checking to confirm the data. The transcriptions then were coded individually by two coders, the researcher and one of the research assistants. After the two coders agreed, then the themes were collected.

RESULTS AND DISCUSSION

There were 33 out of the 36 total first-year students who completed the questionnaires. All the participants did the online LASSI, pre and posttest AMS scale, and post-test IMI. Also, there were several self-assessment questionnaires about the item question of the LASSI. Not all participants attended the autonomy support sessions. The participants who attended at least two sessions were called the intervention group, and the rest were the control group. Participant characteristics are described in the Table 1 below.

Table 1. Characteristic of Students

Characteristics		*Intervention group (N = 15)*	*Participants of control group (N= 18)*
Medical school choice	First choice	14 (93%)	15 (83%)
	Not the first choice	1 (7%)	3 (17%)
Gender	Male	4 (27%)	9 (50%)
	Female	11 (73%)	9 (50%)
School background	Public school	8 (53.3%)	9 (50%)
	Private School	6 (46.6%)	9 (50%)
	Homeschooling	1 (0.1%)	-
Medical professional background	Yes	2 (13%)	1 (5.5%)
	No	13 (87%)	17 (94.5%)
Parents' annual income	<100 million/A	5 (33.3%)	4 (22.2%)
	100-300 million/A	5 (33.3%)	13 (72.3%)
	>300 million/A	5 (33.3%)	1(5.5%)

The initial students' motivation was collected in the Table 2 below.

Table 2. Autonomous Motivation of Students

Characteristic of students		Autonomous Motivation	
		Control group	Intervention group
Medical school choice	First choice	14 (93%)	15 (83%)
	Not the first choice	1 (7%)	3 (17%)
Gender	Male	5.20 ± 0.86	5.17 ± 0.92
	Female	4.80 ± 0.96	5.10 ± 0.86
School background	Private	4.87 ± 0.96	5.08 ± 0.83
	Public	5.13 ± 0.90	5.13 ± 0.93
	Homeschooling		5.25 ± 0.68
Medical professional background	Yes	4.06 ± 0.57	4.97 ± 0.86
	No	5.06 ± 0.92	5.14 ± 0.88
Parents' income	<100 million/A	5.39 ± 0.70	5.21 ± 0.96
	100-300 million/A	4.91 ± 0.97	4.70 ± 0.68
	>300 million/A	4.63 ± 0.81	5.27 ± 0.88

Results found that the autonomous motivation was higher when the medical school was participants' first choice, was higher in males, in those with non-medical professional background, in those from homeschooling background and from a lower income family.

When comparing autonomous motivation from the results of the AMS pre and post-tests, there were no significant changes in autonomous motivation for those two groups. Meanwhile, descriptively, there was an increase in autonomous motivation in the intervention group.

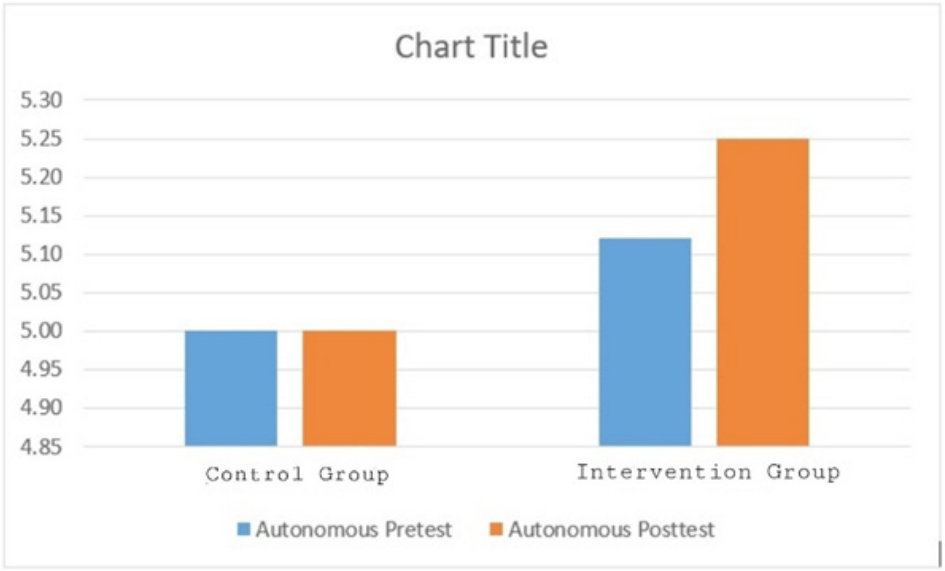

Figure 2. Changes of Autonomous Motivation in the Two Groups

There were no significant changes in the subscales of AMS statistical results. The only significant changes were in the subscale of amotivation. The statistical data were normally distributed, except the

data from the amotivation group in the AMS scale were abnormally distributed, so non-parametric statistical analysis used the Wilcoxon test. There was a significant decrease of the amotivation in participants with *p*-value 0.025

Table 3. Comparison of Amotivation Tests on Both Groups

	Amotivation Pretest	Amotivation Posttest	P value
Control group	30.40 ± 0.90	32.41 ± 0.91	0.893
Intervention group	26.52 ± 0.66	21.67 ± 0.39	0.025*

*statistically significant, p<0.05

The autonomy support activities were significantly correlated with the autonomous motivation with *p*=0.005 in the value component of the IMI questionnaire and the components of interest and perceived choices also showed significant correlation with *p* value = 0.000.

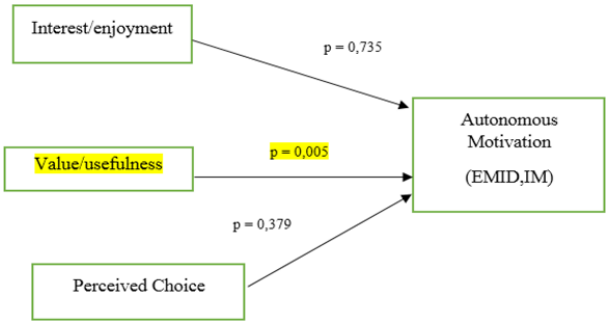

Figure 3. Impact of Autonomy Support on Autonomous Motivation

Qualitative Interview Results

Motivation

Regarding the motivation of participants to study medicine, there were some result of motivation that were identified from the interviews.

Some of the participant want to become a doctor to serve the community.

> *"When I see people who don't have funds for treatment, it stirs my heart to help."*

Some students said that parental wish also make them to become a medical student.

> *"Since I was little, my parents said that when I grow up, I become a doctor, then I carry it all the way up" (ID B)*
> *"My father wanted to be a doctor but didn't succeed so I went to medical school" (ID G)*
> *"The first motivation is because of the choice of parents" (ID F)*

Becoming a doctor is the wish of some students.

> *"When I was a child, when asked about my dream, the answer was to become a doctor." (ID 3)*
> *"Since childhood, I like to learn things related to health." (ID 4)*
> *"Becoming a medical student is my childhood dream." (ID 2)*

Existing doctor in the family, made some students want to study medicine.

> *"Actually, my parents are doctors, so I observed my parents since I was little and wanted to be a doctor." (ID 7)*
> *"My mother who is a pediatrician inspired me to become a doctor." (ID 10)*
> *"My uncle and aunt are doctors, they often asked me to go with them to hospital, since then I want to become a doctor."(ID J)*

Inspiration of the doctor who was treated the ill families.

> *"I think the doctor is great. When I was a child, I saw how they took care of my sick grandfather and it made me want to become a doctor." (ID 3)*

The assumption of a doctor is a knowledgeable person.

> *"I want to be knowledgeable person and i am willing to go through tough learning." (ID 4)*

Some of the students want to study medicine because they want to find life satisfaction.

> *"I want to study and become a doctor so that I am satisfied. self-satisfaction is not measured by the amount of money, but by curing the patient it will make people happy and I will be satisfied." (ID 5)*

The reason for helping the people in need is also one of motivation.

> *"I'm not rich, so I can't share money, but by becoming a doctor I can share knowledge."(ID 7)*
> *"I was sad whenever I saw poor people who were sick, I wanto to help them. So, I wanted to become a doctor." (ID D)*

Impact of Autonomy Support Activities to Motivation

Based on the interviews, participants acknowledged that the autonomous support activities were very useful for them and reminded them of their first motivation and to do their best to keep remembering that motivation and nurture it with improvements on study strategies. These good learning approaches could give positive impact on their academic performance so their enjoyment of learning and value of the study will increase their autonomous motivation.

Participants valued the process by which the autonomy support activities were conducted. These experiences especially gave valuable knowledge and perceptions to them. Additionally, the knowledge of study strategies equipped them with several choices they can use that are suitable with their own personal character. From the interviews, we found several themes about how those activities were able to satisfy their three basic psychological needs.

Table 1. Characteristic of Students

Basic Physiological Needs	Participants' Quotation	
	Intervention Group	Control Group
Autonomy	Self-commitment	Self-commitment
Students interpret learning activities better for their learning journey later. Students voluntarily agree on the importance of increasing their motivation because they are now a medical student. Students have several choices of study skills that are useful to motivate them to achieve their best performance while studying.	Able to know which part need the improvement Better time management Usage of internet maximally Priority choice ability	Self-evaluation regarding time management Better time management Self-regulation
Competence	Give new spirit	Give new spirit
Self-confident as a medical student Understanding the benefit of smart learning and study with strategies	Finding the suitable methods individually Better time management	
Relatedness	Enhancement of motivation	Enhance the motivation
Their passion to become a doctor is unique and will give benefit to many people. Privilege as a medical student, and access to discuss with expert doctors	Reflection of the initial motivation Becoming active in the medical organizational	Reflection of the initial motivation, keep continue though study will not be easy

Motivation to study medicine varies among medical students. We found that autonomous motivation among the first-year students needs to be improved. The activities held were considered valuable for improving the students' autonomous motivation. Both methods gave the same result for improving motivation, because of the direct interaction of the mentors and students. Our finding was similar with the tips from Kusurkar to stimulate intrinsic motivation.[4] The first-year students need a supportive environment that could nurture them to have their own autonomy. Some difficulties they might have during their first-year adaptation can be minimized by giving them the supports they need. Being a college student needs adaptation so they can start to study effectively and also strategically.

The finding of autonomous motivation that was higher in males is different from other studies that found female students' autonomous motivation was higher.[3,5] Similar to Kusurkar's finding that graduate students have autonomous motivation, we found that homeschooled students also had higher autonomous motivation because of their readiness of learning and good self-directed learning.[22,23] Coming from low socio-economic level appeared to create high autonomous motivation, but this connection has not been widely studied yet, so there are not enough data on this topic related to motivation. Remarkably, participants who have no medical family background were more autonomously motivated. This finding agrees with the results of Griffin's study that showed if students totally agreed with the parental wish to study medicine, it could lead to long-term burnout.[24]

The autonomy support activities provided valuable activities to increase motivation. Participants were able to know that they have control over their learning activities, they also began to re-manage their strategies to be more suitable with college learning, and they felt that they were more capable to implement the new skills for their daily learning. Those goals are relevant to their image of becoming a doctor who should be a lifelong learner.[1,8] These activities were able to fulfill the three basic psychological needs for autonomous motivation. This finding is consistent with the increase in autonomous motivation as well as the significant reduction of amotivation in the intervention group. The statements from the in-depth interviews supported these findings.

> *"Participating in these three sessions gave me the awareness to manage my time wisely, now I am able to prioritize my study". (ID 3)*
>
> *"As a medical students' family member, I will join the organization to keep me motivated, I need those environments." (ID 7)*
>
> *"During the session, I wrote my SMART goals and it helps me deal with distractions. I am confident I can study well with all those skills I have learned." (ID 9)*

Another interesting finding from the research is regarding the students' lack of readiness to study in higher education and the suitable methods to integrate the autonomy supports in the curriculum. Most of the participants got important feedback from the LASSI questionnaire to improve their learning skills. This finding is consistent with the results in the Gunanegara study which showed that medical students already have the intrinsic motivation but lack self-direction in their learning strategies.[25] Responding these findings, there is a necessity to improve the medical faculty's ability to provide autonomy-supportive teaching.[4,26]

Limitations and strengths

The strength of the research is the use of a combination of two questionnaires: the AMS questionnaire to know the motivation of participants and the IMI questionnaire to explore whether the interventions conducted were able to increase the students' intrinsic motivation or not. To the author's knowledge, the combination of the motivational workshop and the study strategies mentoring sessions are the first times these approaches were combined and conducted in medical education. Participants were actively involved during the motivational workshop and mentoring sessions, which gave a significant impact because they could reflect on their previous ability and move forward to making improvements by knowing that those activities are valuable for them so they became more self-motivated.

This research had several limitations. First, the design of the intervention was long, so the compliance of the participants was not maximal. Several efforts were done to maximize the procedure of the intervention, which included delivering the self-assessment questionnaire through the WhatsApp group. Accordingly, one suggestion for another study is to simplify the design. Another limitation was that there was no assistant while conducting the interviews, so the researcher did the interview alone. This could be a limitation and cause recall bias, although anticipation was made by conducting the interviews with guided questions. Additionally, our study did not explore the participants' evaluations regarding the ways the speakers and mentors approached them. Future research is warranted to investigate the participants' perceptions of the mentors' or tutors' approaches to support the students' motivation.

CONCLUSIONS

The findings indicated most of the participants with autonomy in motivation are males, from a non-medical profession and lower-income family, and included a home-schooled student. Motivation to study medicine varies, and can be mixed, consisting of both intrinsic motivation and extrinsic motivation. The study strategies activities could significantly lower the amotivation subscale in the intervention group and also increase the autonomous motivation of the participants in the intervention group. The motivational workshop and strategies of learning mentoring were considered valuable activities for the participants and able to give support to the students' autonomy, competence, and relatedness to enhance their autonomous motivation to study medicine.

RECOMMENDATIONS

There are several things that must be considered in facilitating and providing learning support for new medical students., especially students of private medical schools. Any differences in study skills that can be anticipated should be corrected.

The learning skills need to be measured during the first week, and if there is evidence that they lack those skills, then they should be trained on those skills.

Motivation is dynamic, there are several factors from the learning environment that play a role. Therefore, monitoring and finding the best support for autonomy for each students are important. The faculty can give feedback and inspiration so that the student autonomously motivated.

ACKNOWLEDGEMENTS

The author would like to thank Lisa Lestari, MD for helping in statistical data analysis. The author also thanks Prof. Dra. Raden Ajeng Yayi Suryo Prabandari, M.Si., Ph.D. as a speaker of the motivational workshop; Kuncoro Dewi Rahmawati, D.Psi., M.Psi., Psikolog; Prisca Eunike, S.Psi., M.Psi., Psikolog; and Tasia Puspa Sari, S.Psi. as the mentors of learning strategies.

COMPETING INTEREST

This research was funded by Ciputra University. The authors declare that there is no any conflict of interest related to this study.

LIST OF ABBREVIATIONS

AMS : Academic Motivation Scale
IMI : Intrinsic Motivation Inventory
LASSI : Learning and Study Strategies Inventory
SDT : Self-Determination Theory

AUTHORS' CONTRIBUTION

Elizabeth Sulastri Nugraheni - developed research proposal, data collection, data analysis, and publication manuscript.

Doni Widyandana – developed research proposal, data analysis and manuscript's review.

Rachmadya Nur Hidayah – developed research proposal, data analysis and manuscript's review.

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