นิพนธ์ต้นฉบับ • Original Article

ความน่าเชื่อถือของการประเมินตนเองในนักศึกษาแพทย์มหาวิทยาลัยวลัยลักษณ์

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Reliability of Self-Assessment among Medical Students at Walailak University

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หลักการและวัตถุประสงค์: การสะท้อนคิดและการให้ข้อมูลป้อนกลับเป็นวิธีหนึ่งที่เพิ่มความแม่นในการประเมินตนเอง ซึ่งในประเทศไทยมีการศึกษาในประเด็นนี้น้อย งานวิจัยมีวัตถุประสงค์เพื่อ 1) ประเมินประสิทธิผลของกิจกรรมสะท้อนคิดและการให้ข้อมูลป้อนกลับต่อการส่งเสริมความแม่นในการประเมินตนเองและผลลัพธ์การเรียนรู้ของนักศึกษาแพทย์มหาวิทยาลัยวลัยลักษณ์ 2) ประเมินทัศนคติของ นศพ. ต่อกิจกรรมสะท้อนคิดและการให้ข้อมูลป้อนกลับ

วิธีการศึกษา: เป็นการศึกษาไปข้างหน้าชนิดไม่มีกลุ่มควบคุม ปีการศึกษา 2560 มหาวิทยาลัยวลัยลักษณ์ นศพ. ปีที่ 3 อาสาสมัครเข้าร่วมการศึกษา ทำแบบสอบถามก่อนสอบ ทำข้อสอบปรนัย 100 ข้อ จำนวน 2 ครั้ง รวมทั้งร่วมกิจกรรมหลังจากการทำข้อสอบชุดแรก เก็บวิเคราะห์ข้อมูลลักษณะพื้นฐาน คะแนนที่คาดหมาย รายวิชาที่คาดว่าได้คะแนนมากสุดและน้อยสุด และคะแนนที่ได้จริง

ผลการศึกษา: มีอาสาสมัครเข้าร่วม 38 ราย (ร้อยละ 77.6) ส่วนใหญ่เป็นเพศชาย (ร้อยละ 57.9) อายุเฉลี่ย 20.6 ± 0.6 ปี หลังจากกิจกรรมสะท้อนคิดและการให้ข้อมูลป้อนกลับ ความแตกต่างระหว่างคะแนนที่คาดหมายกับคะแนนที่ทำได้จริงลดลงอย่างมีนัยสำคัญทางสถิติ ($p < 0.05$) คะแนนที่ทำได้จริงสูงขึ้นร้อยละ 20.7 (95%CI 15.3-26.0) อย่างมีนัยสำคัญทางสถิติ ($p < 0.001$) และอาสามสมัครส่วนใหญ่ (ร้อยละ 57.9) เห็นว่ากิจกรรมดังกล่าวมีประโยชน์

สรุป: การสะท้อนคิดและการให้ข้อมูลป้อนกลับช่วยส่งเสริมความแม่นในการประเมินตนเองและผลลัพธ์การเรียนรู้

Background and Objective: Owning to self-assessment limitations, reflective practice and feedback is one of the methods help improving self-assessment accuracy. So far, there is little evidence in its practicability in Thai medical students. The aims of this study were (1) to investigate the effectiveness of the reflective practice and feedback on improving self-assessment accuracy and learning outcomes in medical students at Walailak University; (2) to explore participants' perspectives on the reflective practice and feedback.

Methods: This prospective uncontrolled study was conducted in the academic year 2017 at Walailak University. Third-year students voluntarily enrolled into the study. Surveys were contributed before the two examinations that consisted of one-hundred multiple choice questions. Reflective practice and feedback session was held after the first examination. Baseline characteristics, self-estimated scores, declared strengths and weaknesses, and actual scores were used for data analysis.

Results: We had 38 volunteers (77.6%) with male predominance (57.9%) in participants. The mean age was 20.6 ± 0.6 years. After the reflective practice and feedback, the difference between the median of self-estimation score and the median of actual score decreased significantly ($p < 0.05$). The actual scores increased by 20.7 percent (95%CI 15.3-26.0) significantly ($p < 0.001$). Majority of participants (57.9%) agreed that the reflective practice and feedback was helpful.

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ในนศพ. ไทย อย่างไรก็ตามควรศึกษาเพิ่มเติมว่าผลการศึกษานี้สามารถนำไปใช้ในโรงเรียนแพทย์ไทยแห่งอื่นได้หรือไม่
คำสำคัญ: การประเมินตนเอง, ความแม่น, การสะท้อนคิด, การให้ข้อมูลป้อนกลับ, ไทย

Conclusions: Reflective practice and feedback improve self-assessment accuracy and learning outcome in Thai medical students. Further work needs to be carried out to investigate whether the results are transferable to other Thai medical schools or not.
Keywords: Self-assessment, accuracy, reflective practice, feedback, Thai

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Introduction

Medicine is an always ever-changing field, and all knowledge may not be provided in the undergraduate nor postgraduate medical curriculum. Thus, medical students need to identify and fill their knowledge gaps in order to provide optimal management to their patients. Apart from that, educators also need to prepare students for this lifelong learning. To enhance self-knowledge, the initial step for the students is to encourage them to be able to identify knowledge gaps 'self-assessment'. Self-assessment—which is modifiable by education[1, 2] is defined as a personal evaluation of one's professional attributes and abilities against perceived norms[3]. It measures students' ability to identify their strengths and weaknesses in relation to others[4]. Unfortunately, their self-assessment limitations have been reported, therefore, these would cause poor self-directed learning performances[5-7]. In addition, their accuracy of self-assessment is not always concordant with improved performance[8]. As a result, they need additional processes to sharpen those skills to attain better learning outcomes.

Reflection, together with feedback, is one of the effective methods which allows students to deal with these limitations[9, 10]. It has been used and proved effective for improving, particularly, Western students' self-assessment skills. Notwithstanding, little studies have been investigated in Thailand where sociocultural factors differ from the West. With the culture that emphasizes on respect, humility and observation-prone learning style, students often struggle with reflective practice and feedback[11]. Thus, it is helpful to declare explicit evidence before we adopt the concept and implement these strategies. We hypothesized that reflective practice and feedback could improve the self-assessment accuracy in Thai medical students, as well as, their learning outcome.

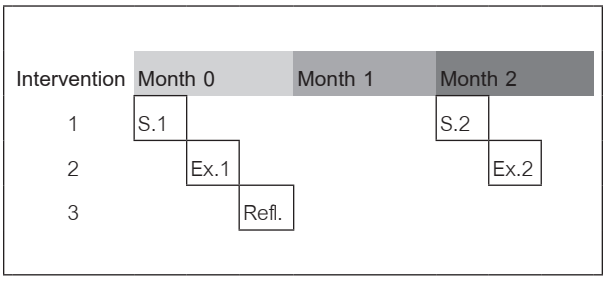
The aims of this study were (1) to investigate the effectiveness of the reflective practice and feedback on improving self-assessment accuracy and learning outcome outcomes in medical students at Walailak University; (2) to explore participants' perspectives on the reflective practice and feedback in terms of assisting learning process and outcome.

Methods

This prospective uncontrolled study was conducted in the academic year 2017 at School of Medicine, Walailak University. Forty-nine students would freely form six study groups to prepare for their National License Examination (NLE). Two formative assessment tests were provided two months apart. Each examination consisted of one hundred English multiple choice questions (MCQs) with two hours period. One week prior to each examination, volunteer students, who were recruited in this study, were asked to fill an anonymised online survey via Google forms (https://www.google.com/forms). The questionnaires consisted of demographic data (age and gender), student ID, self-estimated scores, and knowledge areas asserted to be their strengths and weaknesses. One week after examination, individual score analysis was distributed to each student directly. At the time, thirty-minute reflection and feedback session was held for each student group.

We collected data from two surveys and scores from pre-NLE tests, as well as, their accumulated grade point average (GPAX) from November 2017 to January 2018. In the second survey, we also assessed participants' perspectives of the reflective practice and feedback using the Likert Scale. (Figure 1)

Hereby, we defined 'reflective practice and feedback' as the activity that we asked volunteers for estimating their pre-examination scores and stipulating the subject areas as their own weaknesses and strengths. Thereafter, we gave their actual scores back and urged the volunteers to find their ways to increase their scores. In order to define 'self-assessment accuracy', we calculated the difference between estimated scores and actual scores. The accuracy was inversely proportional to the calculated difference. And 'learning outcomes' in this study was defined as the actual scores.



Note. — S. = Survey; Ex. = Examination; Refl. = Reflection.

Figure 1 Flow chart for the intervention and data collection

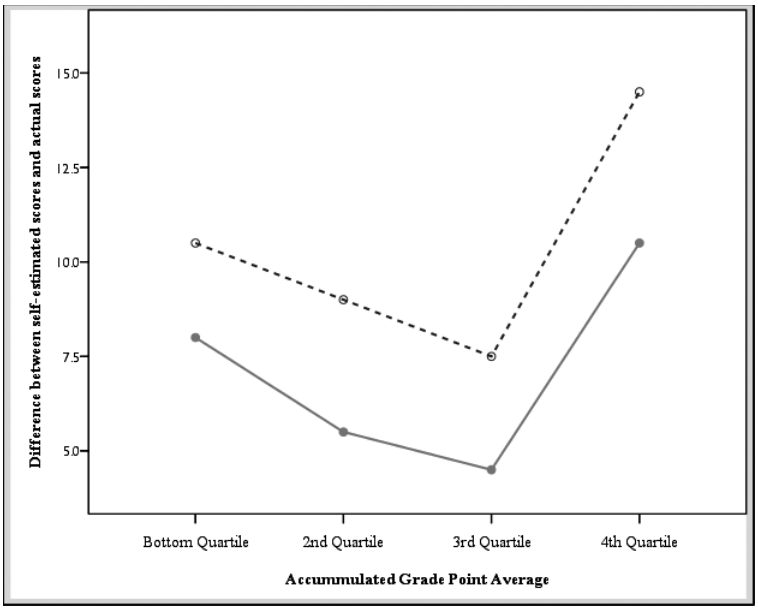
We used GPower software version 3.1.9.2 for computing achieved power from given sample size[12]. Based on a calculated effect size of 0.25 and an alpha error probability of 0.05, GPower showed that power was 0.33.

Statistical analysis was performed using SPSS software version 17 (SPSS Inc., Chicago, IL, USA). Mean and standard deviation (SD) or median and range were used to describe continuous data. Frequency and percentage were used for categorical data. Analyses of data were performed using the t-test or Wilcoxon test depending on data distribution. A $p < 0.05$ by two-tailed tests was considered to be statistically significant. Walailak ethical committee of the institute had approved the study protocol (WUEC-16-123-01). The study complied with the International Conference on Harmonization of Good Clinical Practice and principles of the Declaration of Helsinki.

Results

There were 38 out of 49 students joined the study. Participants were predominantly male (n=22). The mean age was 20.6 ± 0.6 years. With a post hoc analysis, the difficulty index of the first examination and the second examination were 0.34 and 0.41, respectively. The discrimination index of both examinations was 0.10. After the reflective practice and feedback, the second median self-estimated score (40.0, IQR 30.0-50.0) was lower than the first median self-estimated score (47.5, IQR 35.0-50.0) significantly ($p < 0.05$). Additionally, these decreased scores were observed regardless of GPAX. The first median self-estimated scores of participants within the 1st to 4th quartile were 45.0 (IQR 37.5-55.0), 40.0 (IQR 35.0-55.0), 42.5 (IQR 32.5-50.0), and 50.0 (IQR 30.0-60.0), respectively. And the second median self-estimated scores of participants within the 1st to 4th quartile were 42.5 (IQR 35.0-47.5), 37.5 (IQR 30.0-45.0), 40.0 (IQR 30.0-42.5), and 40 (IQR 30.0-60.0), respectively. Overall, participants' scores significantly increased by 20.7 percent (95%CI 15.3-26.0) after reflective practice and feedback ($p < 0.001$). The percentages of mean scores of participants within the 1st to 4th quartile increased by 8.2 (95%CI -3.6-20.0), 23.6 (95%CI 11.8-35.5), 26.5 (95%CI 17.3-35.6), and 21.3 (95%CI 8.4-34.2), respectively.

The difference between self-estimation scores and the actual scores, defined as self-assessment accuracy, was shown in Figure 2. The overall median difference in self-assessment accuracy before (9.5, IQR 3.0-22.0) and after (8.0, IQR 3.0-13.0) the reflective practice and feedback was different significantly ($p < 0.05$). We observed improving trends of the self-assessment accuracy in all participants.



Note.–The dotted line demonstrates participants' difference between self-estimation scores and actual scores before the reflective practice and feedback. And the solid line demonstrates difference between self-estimation scores and actual scores after the reflective practice and feedback.

Figure 2 The difference between self-estimation scores and actual scores based on participants' accumulated grade point average (GPAX)

With intra-individual analysis, most participants failed to identify their weakest or strongest subject areas. Only ten participants identified their weaknesses correctly and eight participants identified their strengths correctly. Moreover, we found no differences between two examination scores among those who identified their weaknesses correctly and also participants who identified their strengths correctly. However, in the second survey, seven out of ten participants declared the same weakest subject area as they did in the first survey and one out of eight participants declared the same strongest subject area as he did in the first survey.

We also assessed participants' perspectives on their reflective practice and feedback. Majority of participants agreed that the reflective practice and feedback was helpful and assisted them identifying their weaknesses and strengths, and, in turn, setting more explicit learning goals (Table 1).

Table 1 Participants' perspectives on the reflective practice and feedback. (%)

Statements	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. The reflective practice and feedback was helpful.	5.3	10.5	26.3	34.2	23.7
2. The reflective practice and feedback assisted you in identifying your weakness and strength.	7.9	13.2	28.9	31.6	18.4
3. The reflective practice and feedback assisted you in setting the explicit learning goal.	5.3	13.2	31.6	31.6	18.4
4. The reflective practice and feedback assisted you in gaining higher test scores.	5.3	23.7	31.6	26.3	13.2

Discussion

The primary aim of the study was to investigate the effectiveness of the reflective practice and feedback on improving students' self-assessment accuracy and their learning outcomes. With a significant difference in self-assessment accuracy, it may imply that the reflective practice and feedback could improve self-assessment accuracy in Thai medical students without cultural barriers to reflective learning. We realize that the success factors are subject to the group environment which must be comfortable and safe, as well as, skills of educators[13, 14]. In detail, we observe the most impact on improving accuracy in participants within the third quartile followed by participants in the second quartile. Whereas those within the bottom quartile gained the least scores improvement despite improving on the self-assessment accuracy after the reflective practice and feedback. The reason for this is probably that an accurate self-assessment is not always in concordance with improved performance[15]. Furthermore, the additional option for self-improvement might be through seeking out and accepting feedback from reliable and valid external sources, for example, standard examinations, trained educators[15, 16]. Regarding an effect on learning outcomes, scores increased by approximately 21 percent significantly after reflective practice and feedback. However, these increased scores were slightly higher in comparison to a previous study which the reflective practice and feedback was not provided[17]. With intra-individual analysis, only ten participants could identify their weaknesses correctly, and eight participants could identify their strengths correctly. And there was no significant increase in scores of these two groups. We found that majority of students still declared the same weakest subject area or failed to keep the same strongest subject area. Thus this may explain why they could not gain higher scores in those subject areas. Further work needs to be carried out to elucidate how we can alleviate their challenges.

The secondary aim of the study was to explore participants' perspectives on the reflective practice and feedback. The majority of participants agreed that the reflective practice and feedback was helpful and assisted them in identifying their weaknesses and strengths and setting the explicit learning goals. These positive attitudes correspond well with our results as mentioned above except identifying the weaknesses and the strengths. And the majority of them rated the neutral response on impacts of the reflective practice and feedback in terms of gaining higher test scores. It reaffirms that the reflective practice and feedback might not be a sole intervention to enhance the remarkable learning outcomes on their perspectives. A previous study of students' perspectives revealed that other factors—such as early revision, deep learning, family support, and time management—might influence high academic achievement[18].

We are fully aware that our research may have several limitations. Firstly, the study was a prospective single-center study thus the results might neither be generalizable nor transferable to other medical schools. Secondly, the study could not be compared with a controlled group, i.e. a group without feedback, because previous studies revealed that self-assessment might be more effective when combined with feedback[9] and specific reflections only occur when specific feedbacks were provided[19]. Another limitation is that this study did not include other factors, which may moderate the increased scores. Finally, through a post hoc analysis, the difficulty index of the second examination was slightly higher than that of the first examination. This could mislead us to conclude that participants gained truly higher scores. However, we could not launch the same examination because of examination exposure limits.

Conclusion

Reflective practice and feedback play an important role in significantly improving students' self-assessment accuracy and their learning outcomes. Majority of participants agreed that the reflective practice and feedback was helpful. However, participants within the bottom quartile may need further help to enhance their scores. Moreover, an intra-individual analysis revealed

that only a minuscule number of participants were able to identify their weaknesses or strengths correctly. They also failed to improve their weaknesses or focus on their strengths. Further work needs to be carried out to elucidate how we, educators, could help these two particular groups solving their learning problems in order to achieve better learning outcomes.

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