Engaging trainees by actively giving feedback will increase their receptiveness to peer' feedback and motivate behavior-changes in holistic care: a pilot study

Szu-Hsien Wu[1], Ying-Ying Yang[1], Boaz Shulruf[2], Ling-Yu Yang[1], Chen-Huan Chen[3], Fa-Yauh Lee[1]

Corresponding author: Prof Ying-Ying Yang crystallyyang@gmail.com
Institution: 1. Taipei Veterans General Hospital, High-fidelity Medical Simulation Center for Holistic Care and Inter-Professional Collaboration, Taiwan, 2. New South Wales Syndney University, Australia, 3. National Yang-Ming University, Taipei, Taiwan
Categories: Learning Outcomes/Competency, Teaching and Learning, Continuing Professional Development, Simulation and Virtual Reality

Received: 09/01/2019
Published: 12/03/2019

Abstract

Background: Continuous trainings of holistic-care behaviors, including teamwork and communication, are important for health professionals to ensure holistic care. In holistic-care simulation training, receiving feedback is a regular step to help trainees assess and rethink their practice. Initial acceptance of feedback by trained health professionals will motivate them in changing behaviors. So, it is importance to increase the trainee's initial receptiveness of in-training feedback.

Objective: This study aims to evaluate whether engaging trainees by actively giving feedback will increase their receptiveness to peer’ feedback and motivate behavior changes in holistic care.

Methods: Health professionals without previous holistic-care training were enrolled, and randomly divided into feedback-giver groups including A (bi-directional feedback recipients and givers group) and C (unidirectional feedback givers group) groups, and non-feedback givers group B (regular feedback recipients group). In addition to immediate satisfaction and receptiveness to in-training peer-feedback, the percentages of health professionals who are willing to make immediate and continuous motivated type of behavior-change were compared between groups.

Results: Higher satisfaction score and higher percentage of motivated type behavior changes were noted in feedback-giving-groups (A and C) than those in non-feedback-giving group (B). The feedback training's effectiveness was confirmed by high preceptor approval of trainee's feedback skills and trainees’ good receptivity to
their peers’ feedback. Self- and mentor-assessments revealed that initial positive receptiveness (determined by high positivity and usefulness scores) to peer’s feedback is associated with more motivated-type behavior changes in their clinical practice.

**Conclusion:** Current study suggested that feedback-giving training is a feasible strategy to increase receptiveness of participants to peer’s feedback and activate participants’ motivation to make the immediate and continuous behavior-type changes on giving holistic-care behavior-specific peer-feedback.

**Keywords:** Holistic-care behavior; peer-feedback; motivated-type behavior changes; receptiveness

**Introduction**

In practice, health professionals need to collaborate with teams for holistic patient care. Healthcare professionals are more willing to modify their behaviors if receiving feedback that their clinical practice was inconsistent with that of their peers or accepted guidelines (Jamtvedt, 2003; Jamtvedt, 2006). Continuous education of feedback skills between peers and teams is widely used as a strategy to improve holistic care (Mugford, 1991; Klebanoff, 2014). Peer-feedback has been shown to promote holistic-care behaviors of healthcare professionals (Holmboe, 2001; McEvoy, 2008). Peer-feedback is learner-centered and bidirectional as opposed to teacher-centered and unidirectional, thereby shifting institutional culture towards active appreciation and seeking of feedback (Epstein, 2007). In addition to passively receiving feedback, the involvement of participants as feedback-giver can increase their interaction with peers and preceptors. Especially, effective peer-feedback may engage team members to do more holistic-care behaviors (Johnston, 2011; LeClair-Smith, 2016; Yu, 2011; Leathard, 2009).

Although implementation of regular simulation-based training for promoting holistic-care behaviors including teamwork and communication for years, Recent annual survey in our institution suggested that the holistic-care behavior-specific peer-feedback between health professionals need to be enhanced. According to the social constructivist learning theory, peer-group learning will help individuals with similar backgrounds to learn by teaching each other in a reciprocal way (Boud, 2001). Peer-group provides the opportunity for participants to work together to achieve a common objective (Johnson, 1999). Peer group-based training had been reported to improve the feedback skills of students (Meerah, 2011). It had been reported that behavior change is an active learning process that involving self-reflection, changing of concepts, action, and maintaining (Prochaska, 1992). Accordingly, educational commentate decide to implement feedback-giving-enhanced module to inspire health professionals to make motivated-type of behavior change on doing holistic-care behavior-specific peer-feedback and practice.

Overall, this study aims to evaluate the effects of this feedback-giving-enhanced module on participants’ satisfaction, participants’ receptiveness to peer-feedback, and participants’ motivation to initiate and continue motivated-type behavior changes on doing holistic-care behavior-specific peer-feedback and practice. Additionally, we sought to investigate preceptors’ agreement to participants’ peer-feedback skills and whether the initial good participants’ receptiveness is associated with more motivated-type behavior changes in holistic care.

**Methods**

**Design**

For years, in our institution, the training courses on holistic-care behaviors including teamwork and communication were led by experienced preceptors. In previous standard courses, health professionals passively receive feedback by
preceptor's observation on their performance in scenario-based simulation. In order to realize the effectiveness of standard courses, a general survey had performed on January 2016. Totally, 58% (45/77) responses had collected. Around 18/45 (40%) of responder had previous training and most of them consider that this training had augmented their holistic care skills. For other 27/45 (60%) responders without previous training, 69% (19/27) of them desire to receive "holistic care and peer-feedback skills" training and expected that they will benefit from this training. Neither with and without experience of previous training, most (67%, 30/45) of the responder reported that their skills for peer-feedback should be improved. So, this new feedback-giving-enhanced module was designed and implemented into standard holistic-care courses. The project was approved by the Institutional Review Board of Taipei Veteran General Hospitals.

Participants

Health professionals (n=34) without previous training were invited to participate in this new feedback-giving-enhanced holistic-care module. From June 2016 through January 2017, the feedback-giving-enhanced holistic-care courses occurred 6 times. In this new module, after excluding four participants due to incomplete survey, a total of n=30 participants were included for final analysis (Table 1).

By cooperation with standardized health professionals in simulation, participants [n=2] were included in group A (bi-directional feedback receipt and giver group), non-feedback-giver group B (regular feedback receipt group) or C (unidirectional feedback-giver group) groups to demonstrate of their holistic-care behaviors including teamwork or communication. Through interactions with peers in three groups during simulations, health professionals practice the skills of giving holistic-care behavior-specific peer-feedback (Figure 1). Group A receive feedback from group C after first scenario and group B receive feedback from group A after second scenario. As observing group, trainees did not receive peer-feedback but responsible for giving feedback after observing performance of group A (Figure 1 and Table 1). In addition to complete on-line feedback during the simulation stage of peer group, feedback-giver need to give face-to-face feedback to corresponding group at debriefing phase.

During the process of practicing holistic-care behavior-specific peer-feedback in face-to-face, preceptors rate their agreement (1=strongly disagree to 5=strongly agree) to participant's feedback skills. Finally, the training ended up with 30-minutes of group discussion (Figure-1).

Figure-1: Study flow chart
Pre-course orientation of holistic-care behavior in team and giving peer-feedback

Participants, preceptors and mentors received a copy of the TeamSTEPPS Team Performance Observation Tool for their reference before training. TeamSTEPPS framework was created by the Agency for Healthcare Research and Quality in the United States, with the aim for providing an evidence-based system for improving holistic-care behaviors including teamwork and communication (Rockville, 2013; King, 2008). Additionally, participants were instructed to give peer-feedback after observation of peer’s holistic-care behaviors in team training. Holistic-care behavior-specific peer-feedback was asked to limit as one sentence for teamwork behavior and another one for communication, including suggestions for improvement. Feedback givers are informed that their on-line responses will be de-identified and forwarded to the feedback recipient in a group format. Then, recipient will make either motivated-type or conservative-type of behavior-change in clinical practice according to peer-feedback.

Holistic-care behavior-focused clinical scenario

Three holistic-care behavior-focused clinical scenarios were used in each simulation course. They were, first, a simulation of a distracted wife and a 61-year-old dyspnea and febrile newly-diagnose pulmonary tuberculosis (TB) male who suffered from progressive disease due to poor complaint to anti-TB drugs in isolated TB wards; second, a simulation of a 35-year-old anxious family, including a pregnant nausea/vomiting/abdominal pain female who needed the selection of suitable anti-emetics and a pediatrics/gynecology consultation in an ER setting and, finally, a simulation of a 57-year-old chest pain male with a distracted son and with the wrong allergy and ID labeling on his arm band, as well as inappropriate prescription induce drug allergy in ICU setting. In scenario, high-fidelity SimMan® 3G patient simulator acted as the patient and standardized patients (SPs) played family member.
Degree of acceptance toward in-training peer-feedback

Then, feedback-recipient-participants (group A and B) were asked to complete an on-line survey about their immediate acceptance to holistic-care behavior-specific peer-feedback. Participants were sent up to 2 reminder emails to complete the on-line survey with 3 questions: "How you agree to the holistic-care behavior-specific peer-feedback? The degree of agreement was defined as "positivity" (1=strongly disagree to 5=strongly agree). How "usefulness" (strongly non-useful=1 to 5=strongly useful) this in-training peer-feedback for you to make a change in behavior in holistic-care?

For evaluation the holistic-care and feedback-giving training on the type of participants’ behavior-change, the percentage of self-reported percentage of motivated-type (contemplated or initiated) behavior-change on doing holistic-care behavior-specific peer-feedback were compared between groups of participants with (group A+C) and without (group B) feedback-giving training. The "motivated-type" behavior-changes including (a) "contemplate a change" or (b) "initiate a change"; "conservative-type" behavior-changes including (c) "decide not necessary to change because the training help me reconfirm the appropriateness of my present holistic-care behavior-specific peer-feedback", or (d) "decide not to change as the learnt skills from training are "not applicable". Each participant was asked to choose 4 of the above answers.

Follow-up survey

The follow-up survey were performed on 6-week after training course. Participants among feedback-giving group (A+C) were sent up to 2 reminder emails with their initial self-reported acceptance to in-training peer-feedback until they had accessed and completed the follow-up survey for whether they do the motivated-type behavior-changes. In order to divide the participants into low- and high- peer-feedback acceptance groups, each participant’ immediate acceptance to online and face-to-face peer-feedback in the "teamwork" and "communication" aspects were summarized and averaged. For example, if a participant' "usefulness" scores of on-line and face-to-face "teamwork" aspects peer-feedback were 4.1 and 3.5 whereas "communication" aspects were 3.9 and 4.4. Then, his (her) average "usefulness" score of this participant will be the average of the summation of 4.1+3.9+3.5+4.4, which is 3.975; it is similar for calculating the average "positivity" score. Then, the third quartile of these average score was used as cut-off values for divide into low- and high-acceptance [represent as high or low "usefulness" score and high or low "positivity" score] group. Through the on-line responses for follow-up survey, the percentage of continuous motivated-type behavior-changes were compared between participants belong to either high- and low- "usefulness" or "positivity" score groups. Meanwhile, mentors of high- and low- "usefulness" or "positivity" score group' participants were interviewed to assess the percentage of them with motivated-type behavior-changes though their continuous observation.

Statistical analysis

Data was presented as mean±SD (standard deviation). Two sample t-test, one-way ANOVA or Mann-Whitney U test were used the significant different between numerical or ordinal data between groups. P values less than 0.05 were considered statistically significant.

Results/Analysis

Table-1 shows characteristics of the all participants, the gender distribution, mean age and distribution of duration of clinical rotation were not different among participants of three groups.
Table-1: Characteristics of participants (n=10 in each group)

<table>
<thead>
<tr>
<th></th>
<th>group A (bi-directional feedback receipt and giver)</th>
<th>group B (regular feedback receipt)</th>
<th>group C (unidirectional feedback-giver)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrate their holistic-care behavior in simulation of…..</td>
<td>1st scenario</td>
<td>2nd scenario</td>
<td>3rd scenario</td>
</tr>
<tr>
<td>As feedback recipients from peers for holistic-care behavior</td>
<td>yes (from Gr. C)</td>
<td>yes (from Gr. A)</td>
<td></td>
</tr>
<tr>
<td>As feedback givers from peers for holistic-care behavior</td>
<td>yes (to Gr. B)</td>
<td></td>
<td>yes (to Gr. A)</td>
</tr>
<tr>
<td>Gender distribution (female, %)</td>
<td>14(70%)</td>
<td>13(65%)</td>
<td>13(65%)</td>
</tr>
<tr>
<td>Mean age (years)</td>
<td>32±2</td>
<td>36±4</td>
<td>33±5</td>
</tr>
<tr>
<td>Month of initiation of their clinical rotation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;6 month</td>
<td>15(75%)</td>
<td>15(75%)</td>
<td>16(80%)</td>
</tr>
<tr>
<td>6-12 month</td>
<td>4(20%)</td>
<td>3(15%)</td>
<td>3(15%)</td>
</tr>
<tr>
<td>&gt;12 month</td>
<td>1(5%)</td>
<td>2(10%)</td>
<td>1(5%)</td>
</tr>
<tr>
<td>Average satisfactory score (4-20 point)</td>
<td>19±5*</td>
<td>17±4</td>
<td>18±6</td>
</tr>
</tbody>
</table>

Notably, higher satisfactory score represents that participants are more benefit from the training than those with low satisfactory score; * p <0.05 vs. group-B

Feedback-giving training increases participants' satisfactory score and motivates more participants to make motivated-type behavior-change

In general, an acceptable degree of the satisfactory scores were noted across three groups (Table-1). Notably, a trend of higher satisfactory scores was noted among feedback-giving groups (group A+C) than non feedback-giving group (group B) (Table-1 and Figure-2). Figure-2 revealed that higher percentage of participants plan to make motivated-type behavior-changes in feedback-giving groups (group A+C) than those in non-feedback-giving regular-group-B (feedback-receipt). Probably, before giving feedback to others, the assessment of their peers' performance can enhance the self-reflection and subsequently make motivated-type behavior-changes.

Figure-2: Effects of new feedback-giving-enhanced holistic-care training on participant's satisfaction and motivation of behavior-changes; # p<0.05 vs. feedback-giving-group
Feedback-giving training increases the participant’s receptiveness to peer-feedback

Figure-3 revealed that the general preceptors’ agreement to holistic-care behavior-specific peer-feedback skills of group-A (*feedback-receipt and -giver*) and group-C (*feedback-giver*) participants were good. This result indicated the success of pre-course training of participants for holistic-care behavior-specific peer-feedback skills in our study.

**Figure-3: Preceptors agreement to participant’s holistic-care behavior-specific peer-feedback skills**
So, it is reasonable to observe that the immediate receptiveness (represent by evaluation of "usefulness" and "positivity" score) of participants to peer-feedback skills of holistic-care behaviors was high (Table-2).

Table-2: Degree of "receptiveness" [represent by "usefulness" and "positivity" score] to immediate holistic-care behavior-specific peer-feedback of participants

<table>
<thead>
<tr>
<th>Two aspects of holistic-care behaviors</th>
<th>Teamwork aspect</th>
<th>Communication aspect</th>
</tr>
</thead>
<tbody>
<tr>
<td>degree of participant’s receptiveness to peer-feedback</td>
<td>&quot;usefulness&quot;</td>
<td>&quot;positivity&quot;</td>
</tr>
<tr>
<td>&quot;on-line&quot; giving peer-feedback</td>
<td>4.3±0.78</td>
<td>4.0±0.61</td>
</tr>
<tr>
<td>&quot;face-to-face&quot; giving peer-feedback</td>
<td>3.1±0.42*</td>
<td>4.4±0.5</td>
</tr>
<tr>
<td>average of the summation of on-line and face-to-face feedback for holistic-care behavior both in teamwork and communication aspects</td>
<td>3.9±0.45</td>
<td>4.3±0.21</td>
</tr>
</tbody>
</table>

This is a 5-point-Likert scale-based assessment. Data were expressed as mean±SD (standard deviation);* P<0.05 vs. on-line’s feedback.

Although did not reach significance, there is a trend of higher preceptor agreement to the group-A peer-feedback skills than that of group-C participants (Figure-3). This result probably indicated that receiving feedback from peers will enhance the peer-feedback skills of participants. In Table-2 revealed that high "positivity" score to face-to-face feedback is associated with low "usefulness" score. However, for on-line feedback, the high "positivity" score is accompanied by the high "usefulness" score. Probably, by awareness of the protection of their privacy by de-identification, this result indicated that feedback-givers are more comfortable to provide constructive feedback on-line than face-to-face (Table-2). The descriptive feedback listed in Table-3 revealed that most of the participants...
gave positive response to this new module.

Table-3: Representative descriptive response in the follow-up survey for satisfaction of the new "holistic-care and feedback-giving" model

<table>
<thead>
<tr>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;I am glad to receive feedback from other participants because it really give the constructive guide to improve&quot;</td>
</tr>
<tr>
<td>&quot;Reviewing and practicing the principles behind giving feedback, provide an opportunity to self reflect on aspects that I think I can improve on&quot;</td>
</tr>
<tr>
<td>&quot;The immediate peer-feedback, both face-to-face and online, on holistic-care behavior including teamwork and communication are very useful because I can remember exactly how the holistic care went and what the suggestions are about&quot;</td>
</tr>
<tr>
<td>&quot;Thanks for providing this opportunity to develop my peer-feedback skills for holistic-care behavior in clinical practice&quot;</td>
</tr>
<tr>
<td>&quot;It was great experience working with participants from other profession. It helps me understand the role of them in the healthcare system, and I really enjoy the peer-feedback and role playing…&quot;</td>
</tr>
<tr>
<td>&quot;Overall training for giving and receiving feedback was extremely helpful because it inspire me to make changes in my practice...&quot;</td>
</tr>
<tr>
<td>&quot;the opportunity to interact with participants outside my discipline throughout activities helps me to understand the necessary an tricks for inter-professional peer-feedback skills (the language, scope and context) focused on holistic-care behaviors...&quot;</td>
</tr>
<tr>
<td>&quot;it is really a process of self-reflection during remote observation of the performance of other participants in holistic-care behaviors, it can help me to accept and take peer-feedback from other easily...&quot;</td>
</tr>
<tr>
<td>&quot;The peer feedback-focused active learning module changed my previous perspective about what other health professional were involved in healthcare system...&quot;</td>
</tr>
</tbody>
</table>

Correlation between participant's immediate receptiveness to peer-feedback and the percentage of participants whose make motivated-type behavior changes

Notably, there was a correlation between participants' receptiveness [represent as level of "positivity" and "usefulness" score] to peer-feedback and the percentage of participants continues motivated-type behavior-changes (Figure-4).

Figure-4: Percentage of making motivated-type behavior-changes at follow-up stage among feedback-giver group (A+C) with high and low initial receptiveness ("positivity" and "usefulness" scores) to peer-feedback
Through self- and mentor-assessment, higher proportion (32.9%) of participants had motivated-type behavior-changes in high-usefulness-scores group than those (19.3%) in low-usefulness-scores group (Figure-4). In comparison with low-positivity-scores-group (15.4%), higher proportion (39.7%) of participants had motivated-type behavior-changes in the high-positivity-scores-group. So, the initial participant’s receptiveness to the peer-feedback might predict their motivated-type behavior-changes in practicing peer-feedback. Overall, even among high-usefulness or high-positivity groups, the proportion of motivated-type behaviors-changes was relative low. This finding indicated that longer and more frequent courses may need to modify the participant’s holistic-care behaviors in future carriers. Interestingly, the correlation between participant’s high "positivity"/"usefulness" score and motivated-type behavior-change was stronger in mentor-assessed results than those in participant’s self-assessment (Figure-4).

**Discussion**

Feedback is a dynamic process that involves the preceptors and the participants to confirm positive behaviors and correct negative ones (Hesketh, 2002). Self-assessment is the first step before giving feedback to others and represents the person’s ability to self-assess for a particular task. Effective feedback giving can activate inactive participants (Pelgrim, 2012). Peer feedback fit in the modern educational paradigm of reflective practice, a concept introduced by Donald Schö̈n in 1983, which gain popularity in recent year (Schön, 1983; Mann, 2009). In addition to optimize the delivery of the peer-feedback, participant’s self-reflection and acceptance to peer-feedback are essential to complete the successful feedback process and thereby change behaviors and practice. Reflective practice aims to develop critical thinking, problem-solving, and self-directed and lifelong learning skills (Schön, 1983; Adams, 2006). So, reflective practice is considered pivotal in the development and maintenance of professional competence (Mann, 2009).

Quality feedback helps healthcare professionals self-monitor, and has been shown to improve clinical competence and self-efficacy (Serkerka, 2003). It had been reported that teaching peer-feedback to medical students early in the
curriculum is shown to result in improved feedback skills and enhanced comfort with feedback (Kruidering-Hall, 2009).

By allowing learners to provide and receive feedback, their responsibilities were aligned with their abilities, and competence and confidence was developed (Fraser, 2001). Thus, the effectiveness of our program comes from simultaneously training of feedback-giving and –receiving skills. In our study, we emphasized the effects of immediate detailed feedback, reflected on observed behaviors, used nonjudgmental delivery, gave appropriate amount of feedback, and offered feedback recipients suggestions for improving and modifying their behaviors (Ende, 1983; Thomas, 2011). It has been reported that feedback is more effective when it is descriptive rather than evaluative as well as focuses upon behavior rather than on the person (OHanion, 1980). It had been reported that positive feedback, when given at the earliest opportunity, is more accurately perceived and recalled than non-positive ones (Rezler, 1971).

Learners are more likely to change behaviors that they suggested they change rather than those that a preceptor member tells them they should change. Acceptance of feedback and incorporation of it to modify ones behavior is dependent on the credibility learners ascribe to it. Immediate and face-to-face feedback has high credibility to help recipient incorporate feedback in their behaviors (Kluger, 2010; Pelgrim, 2013). In the new feedback-giving-enhanced module, our feedback training is characterized by giving immediate behavior-based positive feedback after simulation.

Particularly, our study assessed levels 1 to 3 of Kirkpatrick's evaluation model for the addition of the "feedback-giver" role to regular "feedback-recipient" in our new module (Salvatore, 1998). Kirkpatrick's first level evaluates "participant's satisfaction" and most of the participants gave high satisfactory score to this new module. Secondary, Kirkpatrick's second level evaluates "effects on participant's knowledge". The achievement of Kirkpatrick's second levels by our new module is supported by high percentage of feedback-giver participants plan to initiate motivated-type behavior-changes. Kirkpatrick's third level evaluates "the amount of knowledge and skills learned that participants actually use in everyday work". In our study, we modified the third level to be the "self-reported and mentor-assessed degree of participants' continuous motivated-type behavior-changes".

Kirkpatrick's first level evaluates "participant's satisfaction," and most of the participants gave high satisfaction scores for this new module. Secondly, Kirkpatrick's second level evaluates "effects on participant's confidence, knowledge and performance". The achievement of Kirkpatrick’s second levels by our new module is supported by high percentage of feedback-giver participants plan to initiate motivated-type behavior-changes in intervention-group-A, who gave feedback after receiving peers' feedback.

**Conclusion**

Through empowering participants with skills to receive and give feedback, our study suggested that feedback-giving-enhanced holistic-care course is a feasible approach to increase participants' receptiveness of peer-feedback, activate participants' motivation to make the immediate and continuous behavior changes on giving holistic-care behavior-specific peer-feedback.

**Take Home Messages**

- The continuous training of holistic-care behaviors, including teamwork and communication, are important for
health professionals.

- The assessments by participants and mentors revealed that immediate good acceptance to peer-feedback are associated with more initial- and continuous motivated-type of behaviors.
- In comparison with non-feedback-giver group, higher percentage of motivated-type of behavior-changes was noted in feedback-giver group.
- In this pilot study, the effectiveness of training of feedback-giving and holistic care is confirmed by high degree of preceptor agreement to participant's peer-feedback skills and good participant's acceptance to peer-feedback.

Notes On Contributors

Dr. Szu-Hsien Wu, M.D., Attending physicians of Department of Surgery, Taipei Veterans General Hospital, Taipei, Taiwan; Department of Medicine, National Yang-Ming University, Taipei, Taiwan.

Prof. Ying-Ying Yang, M.D., PhD, MPH, Director of Clinical Skills Center, Department of Medical Education, Taipei Veterans General Hospital, Taiwan; Department of Medicine, National Yang-Ming University, Taipei, Taiwan.

Prof. Boaz Shulruf, M.D., PhD, MPH, BSc, University of New South Wales Sydney Australia.

Prof. Ling-Yu Yang, M.D., PhD, Chief of Department of Medical Education, Taipei Veterans General Hospital, Taiwan; Department of Medicine, National Yang-Ming University, Taipei, Taiwan.

Prof. Chen-Huan Chen, M.D., Dean, National Yang-Ming University, School of Medicine, Taiwan.

Prof. Fa-Yauh Lee, M.D., Deputy Superintendent of Taipei Veterans General Hospital, Taiwan.

Acknowledgements

The work was supported by the grants (MOST-106-2511-S-010-001-MY3) of Ministry of Health and Welfare, Taiwan Association of Medical Education, National Yang-Ming University (107F-M01-0603) and Taipei Veteran General Hospital (V106-EA-007).

Bibliography/References

[https://doi.org/10.3138/jvme.33.1.58](https://doi.org/10.3138/jvme.33.1.58)


[https://doi.org/10.1056/NEJMra054784](https://doi.org/10.1056/NEJMra054784)


https://doi.org/10.1007/s10459-007-9090-2


None.

Declarations

The author has declared that there are no conflicts of interest.

This has been published under Creative Commons "CC BY 4.0" (https://creativecommons.org/licenses/by-sa/4.0/)

Ethics Statement

The project was approved by the Institutional Review Board of Taipei Veteran General Hospitals - Reference: 017-06-010AC.

External Funding

This paper has not had any External Funding

AMEE MedEdPublish: rapid, post-publication, peer-reviewed papers on healthcare professions’ education. For more information please visit www.medepublish.org or contact medepublish@dundee.ac.uk.