

Using a Modified 360° Multisource Feedback Model to Evaluate Surgery Residents in Shiraz University of Medical Sciences

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Background: Traditionally, the residents' competencies such as professionalism, interpersonal and communication skill have been assessed merely based on their faculty' point of view without feedback. These assessments were neither efficiently, nor sufficiently cover the multi aspects` of residents' competencies. These multi aspects competences mandate the need for more all-around evaluations such as 360° degree. The purpose of the present study was to apply the 360° multisource feedback model for assessing the surgery residents' competencies of Shiraz university of Medical Sciences.

Methods: This cross sectional study was performed on 48 residents of the second and third year who were working in the surgery departments. The data were gathered using translated questioners on a 5-point likert scale and distributed to 3 raters (nurses, faculty members and peers). The reliability and validity of the questionnaire were approved by some experts. The data was analyzed by Pearson correlation Coefficient, General Linear Model, T- test and SPSS (17) software.

Results: The Internal Consistency reliabilities were up to 80% for all questionnaire. The Pearson correlation co-efficient was significant between the scores given by faculty members and peers ($r=0.3$, $p=0.01$). The highest mean score given by the evaluators to residents belonged to the Coworker group (149.6 , ± 17.23). The third-year residents gave themselves significantly higher scores in comparison with the second year residents (P value=0.01).

Conclusions: High Cronbach's α demonstrates that the translated questioners were reliable. It seems that based on the valid and reliable results of this study, the 360° multisource feedback model is a good frame work for surgery resident's assessment in Iran.

Keywords: 360° degree; Surgery residents, Evaluation, Performance

ارزیابی دستیاران تخصصی گروه های جراحی با استفاده از اصلاح ابزار ارزیابی ۳۶۰ درجه در دانشگاه علوم پزشکی شیراز

مقدمه: در روش سنتی ارزیابی توانمندی دستیاران مثل حرفه ای گری، مهارت ارتباطی و مهارت بین فردی توسط اعضای هیات علمی و بدون بازخورد انجام می شد که کارایی و تاثیر کافی را برای ارزیابی تمام جنبه های عملکرد در بر نمی گیرد اما روش چند وجهی ۳۶۰ درجه می تواند تمام جنبه ها را در ارزیابی مد نظر قرار دهد. هدف مطالعه استفاده از این روش در سنجش توانمندی های دستیاران جراحی دانشگاه علوم پزشکی شیراز بود.

روش: این مطالعه مقطعی برای ۴۸ نفر از دستیاران جراحی سال دوم و سوم انجام شد. داده ها با پرسش نامه ترجمه شده پنج درجه ای لیکرت و پرسش نامه خود سنجی جمع آوری شد. ارزیابان پرستار، اعضای هیات علمی و همتا بودند. روایی با نظر صاحب نظران و پایایی با الفای کرونباخ تایید شد. آنالیز با آزمون T-Test، General linear model و ضریب همبستگی پیرسون با نرم افزار SPSS ویرایش ۱۷ انجام شد.

نتایج: پرسش نامه ها دارای پایایی بالای ۰.۸۰ بود. ارتباط معنا داری بین نظرات اعضای هیات علمی و همتا وجود داشت ($r = 0.37$ و P value = ۰.۰۱). بالاترین امتیاز مربوط به پرستاران با میانگین نمره ۱۴۹/۶ و انحراف استاندارد $17/23 \pm$ بود. دستیاران سال سوم نیز به خود نمره بالاتری داده بودند و تفاوت نمره بین دستیاران سال دوم و سوم معنی دار بود. (P value = ۰.۰۱)

نتیجه گیری: پایایی بالا نشان می دهد که ارزیابی ۳۶۰ درجه با پرسش نامه فارسی ابزاری مفید برای سنجش توانمندی دستیاران جراحی در ایران می باشد. **واژه های کلیدی:** ۳۶۰ درجه، دستیار جراحی، ارزیابی، عملکرد.

تقييم طلاب تخصص الجراحة باستخدام أداة التقييم المسماة ۳۶۰ درجة في جامعة Shiraz للعلوم الطبية

التمهيد و الهدف: إن في الأسلوب التقليدي في تقييم القدرات التالية عند الطلاب كالقدرة الحرفية و مهارة التواصل و المهارات الفردية كان يتم تقييمها من قبل أعضاء الهيئة العلمية بدون تقييم رجمي (Feedback) التي لم تكن ذو كفاءة و تأثير كافي في تقييم جوانب الأداء. في حال الأسلوب ۳۶۰ درجة يستطيع تقييم كامل الجوانب. إن الهدف من هذه الدراسة هو استخدام هذا الأسلوب في تقييم قدرات الطلاب في قسم الجراحة في جامعة Shiraz للعلوم الطبية.

الأسلوب: هذا الدراسة المقطعية على 48 من طلبة الجراحة في السنة الثانية و الثالثة. تم تجميع المعلومات عبر الاستمارة المترجمة لليكرت و إستمارة الفحص الذاتي. كان التقييم من الكادر التمريضى و أعضاء الهيئة التعليمية و الممارسين. تم تأييد الثبوت بواسطة الفا كرون باخ. و في التحليل الإحصائى تم استخدام General liner model. T-test. و أيضا تم استخدام برنامج SPSS 17 و الضرب بيرسون.

النتائج: إن الاستمارات كان لديها مستوى ثبوت أعلى من 80% كان هناك ارتباط يعنى به بين آراء أعضاء الهيئة العلمية و الممارسين. p value=0.01. $r=0.37$. أعلى إمتياز كان عند الممرضات بمعدل 149.6. الانحراف المعياري $17.23 \pm$

إن طلاب السنة الثالثة كانوا قد اعطوا أنفسهم علامات أعلى و كان هناك اختلاف واضح في العلامات بين طلاب السنة الثانية و الثالثة p value =0.01. **الإستنتاج:** إن الثبوت العالى يدل على أن التقييم ۳۶۰ درجة مع الإستمارة الفارسية تعتبر أداة مفيدة لتقييم طلاب الجراحة في إيران. **الكلمات المفتاح:** ۳۶۰ درجة- طلاب الجراحة- التقييم - الأداء.

تین سو ساٹھ ڈگری ماڈی فائڈ ملٹی سورز فیڈ بیک ماڈل کے ذریعے سرجیکل اسپیشلسٹ اسٹنٹس کی صلاحیتوں کا جائزہ.

بیک گراؤنڈ: روایتی روشوں سے اسٹنٹ ڈاکٹروں کی صلاحیتوں جیسے پیشہ ورانہ توانائیوں، رابطہ برقرار کرنے کی صلاحیت اور ایک دوسرے سے پیش آنے کی صلاحیت کا جائزہ محض اکیڈمیک کونسل کے ارکان اور ایک دوسرے کی شناخت سے لیا جاتا تھا۔ اس روش سے شخصیت کے تمام پہلو سامنے نہیں آتے تھے۔ اسی وجہ سے تین سو ساٹھ ڈگری ماڈی فائڈ ملٹی سورز فیڈ بیک ماڈل کے ذریعے معاون ڈاکٹروں کی شخصیت کا جائزہ لینے کا پروگرام بنایا گیا۔ یہ تحقیق شیراز کی یونیورسٹی آف میڈیکل سائنس میں انجام پائی ہے۔

روش: اس تحقیق میں ایتالیس سرجیکل اسپیشلسٹ ڈاکٹروں نے شرکت کی جو دوسرے اور تیسرے برس میں پڑھ رہے تھے۔ ڈیٹا کا تجزیہ ٹی ٹسٹ، جنرل لینیئر ماڈل، پیرسن ٹسٹ اور ایس پی ایس ایس سے کیا گیا تھا۔ تحقیق میں شرکت کرنے والوں کو دو طرح کے سوالنامے دئے گئے تھے جس میں ایک ترجمہ شدہ پانچ ڈگری لائیکرٹ سوالنامہ اور خود کا جائزہ لینے کے لئے ایک سوالنامہ تھا۔

نتیجے: چونکہ سوالنامہ بھرپور طرح سے معتبر تھے لہذا اکیڈمیک کونسل کے ممبران اور دیگر اساتذہ کے نظریات میں کافی ہمابنگی پائی جاتی تھی۔ سب سے زیادہ نمبر نرسوں نے اپنے آپ کو دئے تھے اور تیسری سال کے طلباء نے بھی خود کو اچھے نمبر دئے تھے۔

سفارش: چونکہ سوالنامے کا فی معتبر تھے لہذا تین سو ساٹھ ڈگری کے ماڈی فائڈ فیڈ بیک ماڈل کے ساتھ فارسی کے ماڈلوں سے جانچ پڑتال کرنے سے ایران کے سرجیکل اسپیشلسٹ ڈاکٹروں کی صلاحیتوں کا بخوبی اندازہ لگایا گیا۔

کلیدی الفاظ: سرجیکل اسپیشلسٹ، صلاحیت، تین سو ساٹھ ڈگری ماڈل۔

INTRODUCTION

Evaluation is one of the most important parts of every educational system. The correct use of it can boost the learners' motivation for learner, motivation for learning and also provide us with useful feedback (1). Nowadays, it has been shown that traditional evaluation is not efficient enough to meet the theoretical and practical needs of the learners. As a result of one-way instructor-learner relationship in traditional learning, its evaluation used to be done merely based on the viewpoint of the faculty members (2). What's more, it has been shown that these kinds of evaluations are neither efficient, nor sufficient in the assessment and maintenance of physicians' competence (3). Therefore, the need of new evaluation methods which are capable of doing multiple aspect assessment and providing feedbacks from learners has received worldwide attention (2). One of these methods which have been used in many fields, is the 360° or multisource feedback model of which the reliability has been reported as high as 90 percent in different studies.

More recently, during the two past decades, other authors have shown the priority of this method by evaluating the non-physician members communication skills, performance and humanity of physicians in training and practice (4,5, 6, 7). In Semnan University, this 360-degree feedback model has been used for evaluating the academic performance of students who were admitted without university entrance exam (5).

The object of MSF is to guide professional development. Studies show that practicing physician uses their feedback data to make changes in their practices (8). In this method, a variety of evaluators such as patients, faculty members, medical colleagues, peers, coworkers and self-assessment completed a questionnaire to provide the physicians with feedback about a broad range of competencies (9,10). This method is being usually used for formative assessment and be used for the evaluation of actual behaviors to identified deficiencies (6,15).

It has been suggested that the physicians can use the feedback for their practice improvement (6). ACGME and The College of Physicians and Surgeons of Alberta (PAR program) have suggested this method for evaluating the required competencies; such as communication skill, interpersonal communication, professionalism, collaboration, collegiality, clinical performance and patient care (6, 8). As a multi-aspect program, the residency programs are in need of an assessing method which can cover and assess the learners' acquired competencies in different aspects. Having the mentioned characteristics, it seems that the 360° method is the best comprehensive tool. Although there are various methods used for assessing the residents, including standard questionnaire, Mini-CEX, DOPS, OSCE and standard patient, the common shortcoming in most of these methods is their limited scope of evaluation which does not exist in the 360° method (3,7, 8).

The validity, reliability and feasibility of this method in residents' competency evaluations have been proven by many studies worldwide (7, 9, 10).

Skills and competencies in clinical practice are necessary for the medical profession. In fact, in patient care, doctors require practical skills in addition to scientific knowledge and the assessment of professionalism is still one of the difficult issues in medical education (19,20).

Likewise, Iran Health Ministry has also discussed the possibility of 360° model adaptation for residents' evaluation; however, only limited pilot studies have actually evaluated the residents through this method in Iran and such an evaluation has never been done in Shiraz. Considering an increased demand for a high quality residency evaluation program and lack of an efficient instrument for doing so in Shiraz, we have decided to use this model to evaluate the present status of surgery residents' competencies in Shiraz University of Medical Sciences for the first time.

METHODS

This cross-sectional and census study which assessed all 48 residents who were working in surgery departments of hospitals affiliated to Shiraz University of Medical Sciences.

The study group included 7 neurosurgeons, 18 general surgeons, 8 urologists and 15 orthopedists (45 men and 3 women in total) of which 24 were second-year (sophomore) and 24 were third-year (junior) residents. Informed consent was obtained from all the participants prior to study. This study was done based on a modified version of the 360° or multisource feedback model in which the patients were excluded by the assessors since most of them did not know how to complete the questionnaire and were uncooperative. The first-year residents who were unfamiliar with their specialty and senior residents who were not always present at rotations due to Board examinations were also excluded from the study. The items in each questionnaire were scaled using the 5 point Likert scale with an ascending 5 level of scaling (1=never to 5=always) and the choice "unable to assess" was considered for cases in which an individual could not answer the question.

The data was gathered using a valid and reliable Persian translation of the original 360° questionnaires which was developed in Calgary University (8, 14). The forward translation, which had exactly the same number of questions as the original questionnaire, was evaluated by a bilingual expert panel which confirmed its face validity. Then, it was back translated by an independent translator and its context validity was confirmed by an expert group. Its reliability was also confirmed using a pilot study and the Cronbach's alpha test.

The reliability of the questionnaires (Cronbach's α) were 87% for peers, 93% for self-assessment, 95% for faculty members and 97% for Co-worker questionnaires.

This modified 360° assessment model contained three different questionnaires: The Medical colleagues, Self-assessment and Co-worker. The first two examined professionalisms, communication skills, clinical performance and patient care. The Co-worker questionnaire focused on professionalism and communication skills. These questionnaires were distributed among four groups (The Co-workers (Nurses of operation room), the residents themselves, the faculty members and Peers). Using the

experts' opinions, three assessors were selected in each group. In other words, for each resident, a total number of 10 questionnaires were distributed, of which one was answered by the resident him/herself and three by each group (including the faculty members, Peers and Coworkers). This resulted in a four aspect evaluation.

Written informed consent was obtained from all the residents. The Medical colleague's questionnaire included 34 items and was distributed among residents 'peers and faculty members. The faculty members of each department were selected by educational deputy of that field and totally 12 faculty members were selected from 4 disciplines of study. The residents selected their peers themselves. The Self-assessment questionnaire had 34 items and was answered by all 48 residents themselves. The Co-worker questionnaire contained 19 items and was filled by nurses and department staffs who had worked closely with the resident during his / her rotation. In each group, the average score given to each question by the three assessors were measured and the mean total score for each questionnaire was calculated. The data was analyzed using the SPSS software version 17 and the statistical tests and models such as Pearson correlation coefficient, General Linear Model, T-test were used while they were needed.

Table 1. Correlation matrix of total score of all of the raters.

Assessor	Self-assessment	peer	faculty member	nurse
Self-assessment	-	-	-	-
Peer	0.1	-	-	-
Faculty member	0.04	0.4*	-	-
Nurse	0.2	0.07	0.2	-

* P-value < 0.05

RESULTS

The response rate were (95.8%), (95.8%), (95.1%) and (97.2%) in Self-assessment, Faculty members, Peers and Co-worker questionnaires, respectively. Less than 20% of the respondents selected the choice "unable to assess". The reliabilities (Cronbach's α) of the questionnaires were 87% for peers, 93% for self-assessment, 95% for faculty members and 97% for Co-worker questionnaires.

Pearson correlation co-efficient was significant between the scores given by faculty members and peers ($r=0.4$, $p=0.01$) (Table 1), while no other statistically significant relationship were observed among the groups.

The highest mean score given by evaluators to residents belongs to the Coworkers group (Mean \pm SD=149.6 \pm 17.23). Based on the General Linear Model (Repeated Measure), the differences between the mean scores given by the four groups of assessors were significant ($P<0.05$) (Table2).

Although it was not statistically significant, the nurses and medical staffs gave a better score to the second -years than third -year residents ($P>0.05$).

The third -year residents` Self-assessment mean scores were significantly higher in comparison with the second -years by using T-test (P value=0.01), although no significant differences were observed among the scores which were given to both groups by coworkers, peers and faculty members (Table 3).

DISCUSSION

The 360- degree evaluation method is a better assessment method because it includes perspective of assessor about full spectrum of the resident's behavior.

In this study, through a modified 360° multisource feedback model, the second -year and third -year residents of general surgery, urology and orthopedics and neuro surgery

Table 2. Trend of the scores obtained from the assessors

Assessors	Min	Max	Mean	SD
Self-assessment	123/8	166	143/7	\pm 11/55
peer	101/7	171/7	134/4	\pm 15
faculty member	93/5	157/4	135/1	\pm 13
nurse	102/9	170	149/6	\pm 17/23

Table 3. Comparison of the obtained scores in the second and third year residents.

Assessor	Second year		Third year	
	Mean	SD	Mean	SD
Self-assessment	139.73	\pm 9.3	147.7	\pm 12.3
Peer	133.25	\pm 13.9	135.6	\pm 16.3
Faculty member	132.85	\pm 13.5	137.26	\pm 12.5
Nurse	151	\pm 15/6	148/4	\pm 18/9

competencies were evaluated. Not only this study was conducted for the first time in Shiraz, but also considering the acceptable Cronbach's α , it resulted in a reliable Persian translation of 360° multisource feedback questionnaires which provided us a perfect adapted instrument for our academic hospitals. The validity was obtained using the face validity which is similar to other studies and the same competencies (professionalism, communication skill and clinical performance and patient care were evaluated) (2, 3, 12,16). The results of this study suggest that the 360° multisource feedback model is a reliable, valid and feasible method for the residents' evaluation; this result has confirmed the findings of other studies (3, 9,14). Considering the high voluntary participation and response rate, it seems that the residents found the implementation of this evaluation essential. This was consistent with other studies' findings (3, 9,15). Similar to other studies, our findings showed that using the 360° multisource feedback model is beneficial in the evaluation of the residents' main competencies especially professionalism (9, 12, 13,16). In contrast with Joshi and Chandler reports, based on our findings, the residents who obtain higher grades and were clinically more skillful gave themselves higher scores(11,17). This conflict is probably due to the training differences. Since Shiraz University of Medical Sciences' hospitals are referral hospitals, each resident treat varied cases during their residency. They are also responsible for the supervision of many undergrads. These factors contributed to their higher self-confidence and in turn higher self-assessment. Our findings demonstrate that the third -year residents gave themselves higher scores in comparison with the second –years. This is probably due to the fact that they were more experienced and did more procedures. Therefore, they were more confident and used professionalism principles in their daily practices (21). Unlike Massagli study, a significant relationship between the

viewpoints of peers and faculty members were observed. This conflict might be because we used the same questionnaire for both groups since their aspect of evaluations were similar, as both groups had believed in the required clinical competences (12).

As other studies also stated, there was no significant relationship or very little correlation between other groups of the assessors (18).

Similar to other study, compared with the other evaluators, the Coworkers gave higher scores to the residents. (17). It shows that the Coworkers (nurses and staffs) mostly evaluate residents based on professionalism and communication skill (written or oral) and, while they can give good feedback regarding these general competences, more specific and clinical competences cannot be evaluated by them. These skills should be evaluated only by assessors with clinical insight such as faculties and peers.

This study was limited by the fact that it was performed on one field (surgery), in a limited time period and the patients as an assessor was excluded. To enhance the psychometrics properties of the Persian translation of this questionnaire, re-conducting this study in other fields of specialty for a longer period of time is suggested.

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