Evaluation and Correlation between Multisource Feedback and Objective Structured Clinical Examination for Trainee Dentists in Clinical Performance Assessment

Hiroya Gotouda[1,5], Kazutaka Kasai[2,5], Yasuhiro Okamoto[3,5], Seiko Osawa[3,5], Hiroyasu Endo[3,5], Shinichiro Aoki[3,5], Mitsuhiro Ohta[3,5], Michiharu Shimosaka[4,5], Takanori Ito[3,5]

[1]Department of Preventive and Public Oral Health, Nihon University School of Dentistry at Matsudo, Matsudo, Japan, [2]Department of Orthodontics, Nihon University School of Dentistry at Matsudo, Matsudo, Japan, [3] Department of Oral Diagnostics, Nihon University School of Dentistry at Matsudo, Matsudo, Japan, [4]Department of Anesthesiology, Nihon University School of Dentistry at Matsudo, Matsudo, Japan, [5]Research Institute of Oral Science, Nihon University School of Dentistry at Matsudo, Matsudo, Japan

Abstract

Objective: Although multisource feedback (MSF) has been medically reported, there are very few studies concerning MSF in dentistry. In addition, compared with undergraduate dental education, no standardized objective structured clinical examinations (OSCE) criteria in dental postgraduate clinical training for trainee dentists have yet been established. The present study comparatively examined MSF in work place-based assessment (WPBA) as formative evaluation and OSCE as summative evaluation to analyze and construct a clinical performance evaluation in dental postgraduate clinical training. Materials and Methods: The supervising dentist, the dental hygienist, and the receptionist evaluated MSF as formative evaluation and medical interviews for OSCE were administered to trainee dentists at the end of dental postgraduate clinical training for trainee dentists. Results: A positive correlation was observed between the scores assigned by the supervising dentist and those assigned by the dental hygienist as well as between the scores assigned by the dentist and those assigned by the receptionist within the MSF ($p<0.001$). The median of the total score for MSF was significantly higher than that for medical interview (OSCE) evaluation ($p<0.001$). The correlation between the total MSF score and the total score for the medical interview as OSCE was also observed ($p<0.01$). Conclusion: The results of the present study revealed high correlations among items within the MSF evaluation between the evaluation scores assigned by the supervising dentist and those assigned by other evaluators. Moreover, we noted a significant, but not high, correlation between MSF and OSCE, which suggests that these evaluation methods assess different capabilities with respect to skills, and attitudes. Compared with medical studies, few dental studies have comprehensively examined MSF and OSCE. Based on these findings, further research may aid in establishing a standard clinical performance evaluation for administration at the end of dental postgraduate clinical training.

Key Words: Multisource feedback, Objective structured clinical examination, Dental postgraduate clinical training, Trainee dentists, Behavioural science in dental practice, Dental education

Introduction

The Accreditation Council for Graduate Medical Education (ACGME) has established six core competencies (patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems-based practice) that residents are expected to demonstrate [1]. Residency programs are expected to provide a fair and effective evaluation of residents' performances regarding each of these competencies. The evaluation procedures are likely to be based on these competencies regarding efficiency, validity, reliability, and relevance to the resident's practice [1-3].

Despite a consensus that communication skills, such as medical interviews, are important for assessing competency of residents, opinions regarding the assessment of such skills are diverse [4]. The ACGME recommends five assessment methods, including objective structured clinical examinations (OSCEs), standardized patients, multisource feedback (MSF), patient surveys, and checklists [1,5]. Several articles have reported on the appropriate protocols for OSCEs and standardized patient evaluations [6,7]. In addition, patient surveys and MSF evaluations are standard in most hospitals. MSF can predict the performances of medical students in work place-based assessment (WPBA) as well as in the OSCE and licensing examinations [5,8-10].

However, although MSF has been medically reported, there are very few studies concerning MSF in dentistry. In addition, compared with undergraduate dental education, no standardized OSCE criteria in dental postgraduate clinical training for trainee dentists have yet been established. The present study comparatively examined MSF in WPBA as formative evaluation and OSCE as summative evaluation to analyze and construct a clinical performance evaluation in dental postgraduate clinical training.

Materials and Methods

The current study included 102 trainee dentists belonging to the Nihon University Hospital at Matsudo. The study was approved by the Ethics Committee of the same institution, and informed consent was obtained from all participants. For formative evaluation as MSF in WPBA, the supervising dentist, the dental hygienist and the receptionist assessed professionalism (five items) and communication skills (five items), and a supervising dentist and hygienist assessed patient care (five items) and clinical practice (five items). Items used in the clinical performance evaluation were modified from those developed previously [1,11,12] and each

Corresponding author: Hiroya Gotouda, Department of Preventive and Public Oral Health, Nihon University School of Dentistry at Matsudo, Matsudo, Chiba 271-8587, Japan, E-mail: gotouda.hiroya@nihon-u.ac.jp

item was rated on a scale of 1–5 (1=lowest, 5=highest). A supervising dentist and dental hygienist each assessed four areas (professionalism, communication, patient care, and clinical practice) wherein a maximum score of 25 points for each area (100 total points) could be given. A receptionist assessed two areas (professionalism and communication) wherein the maximum score was also 25 points each, totaling to 50 points. The supervising dentist provided comprehensive feedback to the participants at the end of the evaluation. Medical interviews for OSCE as summative evaluation were administered to trainee dentists at the end of dental postgraduate clinical training. Items of the evaluation: Practice listening content (three items, a scale of 0–4), problem-solving skills (one item, a scale of 0–4), communication skills(one item, a scale of 0–5), interview skills(two items ,a scale of 0–3), counseling skills (three items, a scale of 0–3), manners(one item, a scale of 0–3), attitude as medical professionals (one item, a scale of 0–3), item related to clinical record (thirteen items, a scale of 0or1), clinical diagnosis (a scale of 0or10), and Summary evaluation(one item, a scale of 1–5). And Total points were converted into 100 points (MSF and OSCE) [1,5-7,11-14].

Statistical analysis

Descriptive statistics and statistical analyses were performed using the IBM SPSS Statistics software, v.22.0 (IBM, Armonk, NY, USA). Pearson's correlation coefficient was used for correlation analyses, and the Mann–Whitney U-test was used to compare the scores between the two groups. Data are presented as mean ± standard deviation. P<0.05 was considered statistically significant.

Results

The average scores (mean ± SD) for MSF and OSCE were 85.2 ± 9.6 and 79.6 ± 11.6, respectively. The average scores for 54 males and 48 females by MSF were 83.9 ± 9.6 and 86.6 ± 9.6, respectively, showing no significant differences between the two groups. The average scores for male and female by OSCE were77.2 ± 12.3 and 82.3 ± 10.3, respectively, showing significant differences between the two groups (*Table1*).

Table 1. *The average scores (mean ± SD) for multisource feedback (MSF) and objective structured clinical examinations (OSCE).*

	Mean±SD		Mean±SD	
MSF	85.2±9.6	male	83.9±9.6	ns
		female	86.6±9.6	
OSCE	79.6±11.6	male	77.2±12.3	*
		female	82.3±10.3	
ns: not significant		*:P<0.05		

A positive correlation was observed between the scores assigned by the supervising dentist and those assigned by the hygienist (p<0.001) as well as between the scores assigned by the dentist and those assigned by the receptionist (p<0.001). A positive correlation was also observed for higher scores in professionalism and communication compared with the other categories (*Table 2*).

The median of the total score for MSF and that for medical interview (OSCE) evaluations were 86.4 and 82.0, respectively. These scores were statistically a significant difference (p<0.001) (*Figure 1*).

Table 2. *Correlation between the scores assigned by the supervising dentist and those assigned by the dental hygienist as well as that between the scores assigned by the supervising dentist and those assigned by the receptionist in multisource feedback (MSF).*

Correlation coefficient	Professionalism	Communication	Patient care	Clinical practice
Supervising dentist / Dental hygienist	0.54***	0.53***	0.49***	0.46***
Supervising dentist / Receptionist	0.52***	0.59***		
***P<0.001				

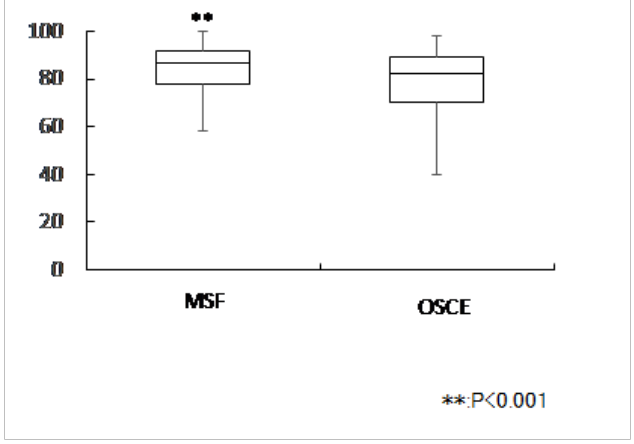

Figure 1. *The median (minimum, maximum, first quantile, and third quantile) for evaluating total multisource feedback (MSF) score and total score for medical interview (OSCE) evaluation.*

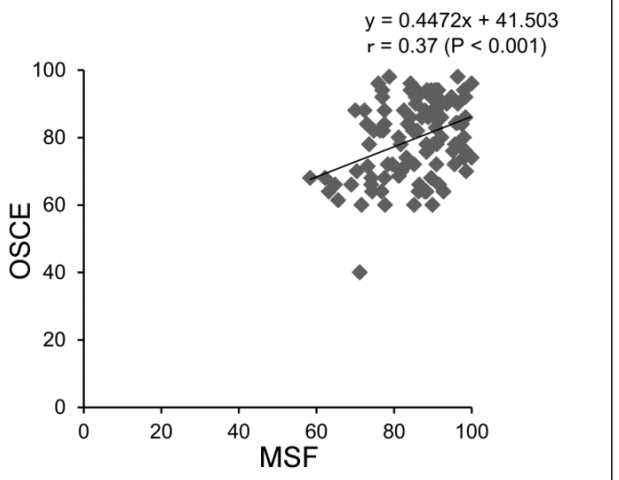

Figure 2. *Correlation between the total multisource feedback (MSF) score and the total score for medical interviews (OSCE).*

The correlation coefficient between the total MSF score and the total score for the medical interviews (OSCE) was r=0.37 (p<0.01) (*Figure 2*).

Discussion

Medical students recruited for residency programs ideally possess qualities for delivering high performance during training and subsequent practice [15]. High and effective communication skills are directly associated with patient satisfaction and the physician's ability to provide quality care [16,17]. The OSCE assesses both communication and clinical skills during clinical training and has been recommended by the ACGME as a tool for assessing communication [1]. MSF occurs when input from peers and a colleague is utilized to assess a person's behavior in the workplace [1-3], because the information is aggregated and provided to the individual as feedback. The ACGME recommends MSF as a key method for assessing competencies, such as professionalism and interpersonal and communication skills [1].An evaluation method usually involves collecting and analyzing information with results leading to either a pass or fail outcome [18]. However, to guide learners to a specific outcome, it is essential to provide feedback in the form of evaluations regarding their achievements, strengths, and weaknesses throughout the program; this is known as formative evaluation. The present study used OSCE as the summative evaluation method after training, and MSF in WPBA as the method of formative evaluation.

According to previous medical studies, the correlation coefficient (r) between the evaluation points of attending physicians and other evaluators varied from 0.2 to 0.7 [13,14]. In the present study, the correlation coefficient between the total evaluation points of supervising dentists and dental hygienists and between supervising dentists and receptionists varied from 0.4 to 0.6, which corroborates with those previously reported in the medical field. Previous research in medical science reported a correlation coefficient of 0.2–0.4 when referring to the relationship between OSCE and WPBA [19]. The current study found significant correlations between MSF in WPBA and OSCE (r=0.37), which corroborates with the results previously observed in medical science reports. The written and objective examinations were useful in evaluating knowledge, whereas the OSCE was effective in evaluating technical skills [19-22]. However, competency cannot be adequately evaluated by individually assessing each component, because it requires an intersection between knowledge, technical skills, attitude, and values. Therefore, WPBAs aimed at observing and evaluating an individual's performance at the workplace [20-22]. Examples of WPBAs include observation and evaluation of medical performances, evaluations performed through case discussions, evaluations performed by colleagues, and MSF evaluations of medical professionals, such as dental hygenists.

Our results indicate a high correlation among the MSF evaluations. However, although our findings supported previous research by identifying a significant correlation between MSF and OSCE, the obtained correlation was not high, indicating differences between the evaluation criteria and method. The current study did not include portfolio evaluation, which evaluates attitudes and values such as an individual's desire to learn and his ability to learn independently. Overall, the most effective form of evaluation combines MSF, OSCE, and portfolios [18,20-22]. In the future, evaluation methods should be examined to make use of the various assessment methods. In addition, it is necessary to develop more effective and comprehensive evaluation methods combining both formation and summative evaluation, increase the number of surveys performed, and create and standardize a method for evaluating dental clinical training certifications. Compared with the field of medical science, in the dentistry field, very few investigatons have been performed combining both MSF and OSCE. Based on these results, the evaluation of clinical ability following postgraduate clinical training was established in dentistry where development and standardization of urgent standards are currently required. Furthermore, proper evaluation techniques can contribute to creating standards in dentistry based on the international trend of quality assurance of higher education and evaluation standards in the field of medical education as proposed by the World Federation for Medical Education.

Conclusion

The results of the present study revealed high correlations among items within the MSF evaluation between the evaluation scores assigned by the supervising dentists and those assigned by other evaluators. Moreover, as previously reported, we noted a significant, but not high, correlation between MSF and OSCE, which suggests that these evaluation methods assess different capabilities with respect to knowledge, skills, and attitudes. Compared with medical studies, few dentistry studies have comprehensively examined MSF and OSCE. Based on these limited findings, further research may aid in establishing a standard clinical performance evaluation for administration at the end of postgraduate clinical residency. Additional development and standardization of criteria are urgently required to achieve this objective.

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