

Clinical Pairing Revisited: A Study at the University of Malaya, Malaysia

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Abstract: This study is part of ongoing educational research conducted by the Department of Conservative Dentistry, University of Malaya, Malaysia, to evaluate the perception of clinical pairing. A thirteen-question survey was distributed to 148 dental students after they had experienced four-handed dentistry. The objectives were to identify the advantages, disadvantages, and the acceptance of the implementation of clinical pairing from the students' point of view. The responses from the open-ended questions were categorized into six main themes (areas of interest): quality-related (Q), patient-related (PT), partner-related (P), lecturer-related (T), infection control (IC), and learning environment (L). Data analysis was done using SPSS version 18. Results indicated that the students perceived they possessed enough knowledge regarding clinical pairing. However, it was found that they still preferred to work independently as compared to working in pairs. The benefits of clinical pairing may not be viewed in the same vein by both dental students and teachers. The quality-related theme was perceived by students as the main advantage of clinical pairing, whilst the partner-related theme was perceived otherwise. The study also revealed that students may have some preconceived notions about pairing that may have impaired their acceptance. As a consequence, some reluctance was seen in their responses.

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Keywords: dental education, academic environment, dental school clinics, dental students, prosthodontics, Malaysia

Submitted for publication 7/19/11; accepted 12/30/11

In many fields of study, effective learning can be achieved by working in small groups. It has been shown that students' performance can be enhanced through interdependence between students and the prospect of being able to learn from each other.^{1,2} Clinical pairing in dentistry refers to a situation in which two students are working together in the clinic: one treating the patient as an operator, the other helping as his or her assistant. Clinical pairing is not a new concept in dentistry,³ as close support, or four-handed dentistry, has been previously practiced among dentists and qualified dental auxiliaries.⁴

The exchange of knowledge between the operator and assistant can improve treatment procedures. An earlier study³ reported that clinical pairing was originally introduced due to the insufficient number of dental nurses to assist the students but later turned out to be useful in several ways. Clinical pairing could be viewed as a source for early practice of assistant procedures, which may result in shorter appointments for patients. There are many other benefits to be gained from this cooperation between operator and assistant. However, there is a likelihood that groups of students may tend to experience interpersonal conflict.^{3,5} Some

students within a group are high achievers, whereas some are free riders.^{6,7} This partnership could also be jeopardized if a member of the pair, especially the assistant, decided to disappear from the clinical situation, thereby defeating the purpose of clinical pairing. Such students may not grasp the importance of the assistant's role in their overall clinical training.

Considering the many advantages of clinical pairing, the Department of Conservative Dentistry, Faculty of Dentistry, University of Malaya introduced the operator-assistant concept for clinical students. This was imperative due to the ever-increasing intake into its undergraduate dental course, as well as the department being pushed to the limit in the provision of teaching staff and support facilities. Since there is no recent study evaluating students' perceptions of clinical pairing, it would thus be interesting to gather facts and explore the thoughts of students regarding this concept. The aim of this study was to evaluate the perception of clinical pairing by dental students with the objectives of identifying the advantages, disadvantages, and acceptance of its implementation from the students' point of view.

Methodology

This study is part of ongoing educational research conducted by the Department of Conservative Dentistry, University of Malaya using purposive sampling. All students in year III (n=70) and year IV (n=78) were selected as the study population. The year III students had one year of clinical experience with four-handed dentistry, while the year IV students had been practicing two-handed dentistry during their third year and were exposed to four-handed dentistry in the current year (year IV). These students (n=148) were paired within their own level of study by the department.

To meet the study objectives, a survey with open- and close-ended items was used to obtain optimal results. A questionnaire adopted from Qualtrough³ was modified and validated for use in this study. The questionnaire was comprised of thirteen questions designed to extract relevant information about students' perceptions, acceptance, and hindrances they faced when paired during their clinical sessions, as well as their suggestions for improving the process. This survey included a combination of items rated on a seven-point scale (1–2=not satisfactory, 3–5=satisfactory, and 6–7=very satisfactory), yes/no questions, and open-ended questions. Other

outcomes resulting from clinical pairing were also retrieved, along with the respondents' feedback for further improvement. Ethical approval for this study was granted by the Ethics Committee, Faculty of Dentistry, University of Malaya.

The responses from the open-ended questions were categorized into the following six main themes (areas of interest) after thorough deliberation amongst the lecturers in the department: quality-related (Q), patient-related (PT), partner-related (P), lecturer-related (T), infection control (IC), and learning environment (L). The descriptor for each theme is shown in Table 1. As for the yes/no responses and rating scores, descriptive statistics were used to analyze these data. SPSS version 18 was used to analyze all data.

Results

Regarding students' perceptions about pairing and reason(s) for its introduction, 93.9 percent of the students reported that they believed they knew why clinical pairing was introduced; only 6.1 percent stated otherwise (Table 2). The responses were themed as described in Table 1. The Q factors (48.1 percent) ranked the highest, followed by IC (22.4 percent) and L (15.4 percent), while the remaining factors were ranked lower.

The students' responses indicated that the majority (75.9 percent) enjoyed working in pairs, while the remaining 24.1 percent stated otherwise. P issues (45.2 percent) were the main reason students disliked clinical pairing, followed by Q (29.7 percent). In contrast, Q issues (44 percent), followed by L (36 percent) and P (16 percent), were the reasons that attracted them (Table 3).

Table 4 shows the students' perceptions about the items they found useful in preparing them for four-handed dentistry. Based on their combined satisfactory and very satisfactory ratings, clinical demonstration (87.5 percent), clinical supervisor (90.4 percent), and lecture (86.6 percent) were considered the three most important items, where most of the responses fell within the satisfactory level (between 3 and 7 on the rating scale). The findings indicated that students found all the items to be almost equally important. Of the six named items, clinical supervisor was ranked the highest (90.4 percent), with satisfactory and very satisfactory ratings, whilst auxiliary staff in the clinic (dental assistants) was ranked lowest (52.1 percent).

Table 1. Themes identified for data analysis

Theme	Definition	Representative Responses
Quality-Related (Q)	Refers to standard of clinical performance, measurement of productivity, and clear documentation of clinical management.	<ul style="list-style-type: none"> • “Work more efficiently and productively” • “Time management improved” • “Better clinical management” • “To achieve better quantity of work/work faster”
Patient-Related (PT)	Refers to student-patient relationship and all associated issues. Category comprised of patient’s satisfaction, patient issues, and relationship between student and patient.	<ul style="list-style-type: none"> • “Comfort and safety of patient” • “Avoid patient from being alone in dental chair/relieves patient’s fear and anxiety” • “Relationship with patient is improved” • “Waste of time if patient fails to show up”
Partner-Related (P)	Refers to student-student relationship in clinical pairing and all associated issues including communication and time management.	<ul style="list-style-type: none"> • “More tension because the partner will show how relaxed he/she is when I am operator” • “Partner always disturbs the operator’s work and gives unnecessary opinions” • “Partner can be helpful and informative” • “Pairing should be between a good student and a weak one so that they will learn from each other”
Lecturer-Related (T)	Refers to student-lecturer relationship and all associated issues, including student perception of the lecturers in practicing four-handed dentistry and student-lecturer relationship.	<ul style="list-style-type: none"> • “Improve our relationship with lecturers” • “Lecturer more relaxed” • “Treat us as students not as experienced dentists” • “Can read up theory from books but in clinical practice we need supervision from lecturers”
Infection Control (IC)	Refers to all issues related to procedures, practices, and techniques in preventing spread of infections.	<ul style="list-style-type: none"> • “Improve cross-infection control” • “To prevent contamination from operator to instruments to be used by other students”
Learning Environment (L)	Refers to use and organization of the clinical setting in four-handed dentistry during daily practice, its practicality, and the social atmosphere. Includes practicality, real-life situation, four-handed dentistry, and teamwork.	<ul style="list-style-type: none"> • “Prepare students for real situations of patient treatment when they go out” • “Less stress” • “Assimilate real clinical situation” • “Share problems, knowledge, experience and have discussions”

Table 5 shows students’ achievements practicing clinical pairing. On the sixteen statements, most students agreed that patient treatment and clinical procedures were more easily executed with pairing (95.9 percent). The majority (95.8 percent) were satisfied with four-handed dentistry, and 95.1 percent believed they learned from their partners. Most statements were ranked as almost equally satisfactory, except for the quantity of patients seen (64.0 percent). Also, 66.2 percent stated that clinical pairing reduces the stress level of students. When the students were asked to specify any other gains, 57.1 percent of those “other” achievements were categorized as Q. On the other hand, the statements “stress is reduced for students” (33.8 percent) and “more patients are seen” (36.0 percent) were rated as unsatisfactory (Table 5).

Of the stated hindrances in clinical pairing, the students were asked to identify the level at

Table 2. Students’ responses to coded themes for knowledge of reasons for working in pairs

	Percentage
Do you know why working in pairs was introduced?	
Yes	93.9%
No	6.1%
If “YES,” what was/were the reason(s)?	
Quality-related	48.1%
Infection control	22.4%
Learning environment	15.4%
Patient-related	10.7%
Partner-related	2.2%
Lecturer-related	1.2%

Note: Reasons were organized by theme.

Table 3. Students' responses to coded themes for liking/disliking clinical pairing

	Percentage
On the whole, did you enjoy working in pairs?	
Yes	75.9%
No	24.1%
If the answer is "NO," why?	
Partner-related	45.2%
Quality-related	29.7%
Patient-related	12.0%
Learning environment	8.5%
Lecturer-related	4.6%
If the answer is "YES," what are the main things you like about student pairing?	
Quality-related	44.0%
Learning environment	36.0%
Partner-related	16.0%
Infection control	3.5%
Lecturer-related	0.5%

Note: Reasons were organized by theme.

which the named items occurred (Table 6). Most students agreed that clinical pairing had increased their apprehension about meeting clinical requirements (81.9 percent) and resulted in fewer patients being treated (81.7 percent). More than half of them expressed difficulties related to partnering. Concern about an inability to choose their partners was rated by 69.7 percent of the students. Although partnering was considered problematic, more than 60 percent disagreed that their partners were hindrances and provided wrong advice. When the students were asked if any other hindrances occurred, 68.2 percent of those identified were categorized in the P theme area, followed by L (20.8 percent) and Q (7.5 percent) issues.

When the students were asked about their acceptance level of clinical pairing, the majority (85.5 percent) said they wanted to have a session to work

alone (Table 7). Only 13.8 percent of the respondents indicated that they did not prefer to have a session free to treat patients without a partner, and 0.7 percent did not answer the question. The students believed that the first and most important factor in convincing them to accept clinical pairing were in the Q category (55.8 percent), followed by L (40.1 percent), P (3.3 percent), and T (1.4 percent).

When the students were asked for additional comments or suggestions regarding clinical pairing (Table 8), most of the additional comments were related to issues categorized as Q and L (34.1 percent and 33.6 percent, respectively). Those were followed by T (16.2 percent) and P (13.3 percent) issues. IC-related issues were ranked the lowest (0.7 percent).

Discussion

The Faculty of Dentistry at the University of Malaya is the oldest dental school in Malaysia. When clinical pairing was introduced in the teaching of dentistry, our school was the pioneer of this new concept in the country. Although it was introduced mainly to overcome logistics problems, such as shortage of clinical supporting staff, limited dental chairs, and unsatisfactory teacher-student ratios, the actual benefits gained from practicing pairing were reported earlier.³

After the initial phase of introducing clinical pairing to the dental students, questionnaires were distributed to assess the new concept from the student's perspective. The results, as reported in this article, were that the majority of students believed they knew the reason why clinical pairing was introduced. This can simply be explained as a consequence of the introductory phase and lectures together with demonstrations given by the department staff prior to implementation. Probing about the perceived reasons why clinical pairing was introduced revealed that students attributed this to the Q theme. Reasons cited

Table 4. Students' satisfaction with items that facilitated clinical pairing, by percentage of total respondents

Items	Not Satisfactory	Satisfactory	Very Satisfactory
Lecture	13.4%	52.1%	34.5%
Clinical demonstration	12.5%	43.1%	44.4%
Clinical supervisor	9.6%	48.3%	42.1%
Group supervisor (lecturer in charge of group)	16.0%	47.2%	36.8%
Reference texts (books, etc.)	10.2%	52.1%	32.7%
Auxiliary staff in the clinic (dental assistants)	47.9%	44.4%	7.7%

Note: Question was worded as follows: How useful were the following in preparing you for four-handed dentistry? On the item "Reference texts," there was no response from 5% of the respondents.

Table 5. Students' level of satisfaction with specified achievements resulting from clinical pairing, by percentage of total respondents

Statement	Not Satisfactory	Satisfactory	Very Satisfactory
Infection control is improved.	7.6%	42.8%	49.6%
Students work four-handed (close support).	4.2%	53.4%	42.4%
Students learn from each other.	4.9%	27.8%	67.3%
Team spirit is developed.	12.5%	50.0%	37.5%
Learning is improved.	6.1%	39.6%	54.3%
Patient treatment and clinical procedures are more easily executed.	4.1%	38.9%	57.0%
Better quality work is produced.	9.6%	41.0%	49.4%
Stress is reduced for students.	33.8%	29.7%	36.5%
Students can work faster.	13.9%	46.9%	39.2%
More patients are seen.	36.0%	41.0%	23.0%
Students have more confidence in patient treatment.	9.7%	46.2%	44.1%
There is improved communication with patient during treatment.	13.2%	50.0%	36.8%
Patients have more confidence in the operator.	14.6%	52.8%	32.6%
Patients' safety during treatment is improved.	9.0%	42.3%	48.7%
Patients receive more professional care.	11.0%	41.0%	48.0%
Patients are more relaxed.	18.7%	44.8%	36.5%
State any other achievements.			
Quality-related			57.1%
Learning environment			7.1%
Infection control			7.1%
Patient-related			7.1%

Note: Question was worded as follows: To what degree were the following achieved? "Other achievements" were organized by theme.

Table 6. Students' level of agreement with specified challenges resulting from clinical pairing, by percentage of total respondents

Statement	Disagree	Agree and Totally Agree
Fewer patients get treated.	18.3%	81.7%
Increased apprehension in achieving clinical requirements.	18.1%	81.9%
Lack of choice for partner selection.	30.3%	69.7%
Difficult to have prior discussion and planning with partner before treatment.	36.8%	63.2%
Difficult to work with partner.	37.9%	62.1%
More stress is induced.	47.5%	52.5%
Work is slower.	50.7%	49.3%
Partner is uncooperative.	56.4%	43.6%
More embarrassing when mistakes are made because of presence of partner.	63.9%	36.1%
Partner is more of hindrance than help.	63.4%	36.6%
Partner often provides wrong advice.	64.0%	36.0%
Please state any other occurrences.		
Partner-related		68.2%
Learning environment		20.8%
Quality-related		7.5%
Lecturer-related		3.8%

Note: Question was worded as follows: To what degree did the following occur? "Other occurrences" were organized by theme.

included the following statements: "to work more efficiently and productively"; "to achieve better quality of work"; and "so operator can pay full attention to the patient to complete treatment faster."

The students were also asked whether they liked or disliked pairing and the reasons for their opinion. More than 70 percent of the students were found to like the new concept, and the Q theme was

Table 7. Students' preference for treating their patients alone, without a partner

Response	Percentage
Yes	85.5%
No	13.8%
No answer	0.7%

Please give some reasons for your response:

Quality-related	55.8%
Learning environment	40.1%
Partner-related	3.3%
Lecturer-related	1.4%

Note: Question was worded as follows: Would you like to have a session free for you to treat patients *without* a partner, i.e., all students to call and treat their own patients? Reasons were organized by theme.

Table 8. Students' comments on the themed dimensions in clinical pairing, by percentage of total respondents

Theme	Percentage
Quality-related	34.1%
Learning environment	33.6%
Lecturer-related	16.2%
Partner-related	13.3%
Infection control	0.7%

Note: Question was worded as follows: Any other comments/suggestions?

again the main reason given. It appeared that the students understand the nature of work in a clinical setting, where an efficient assistant can actually reduce their chair-side time by relieving the operator of the need to stop work to get equipment, organize instruments, and mix materials. The dynamics of four-handed dentistry has been viewed as the process of a skilled operator and assistant working together in a safe, stress-free, productive ergonomic environment.⁸ The findings of our study support this view.

Interestingly, for 45.2 percent of the students who disliked pairing, the P theme was the main cause given. Since the study sample includes students who had experienced two-handed dentistry up to this time, this change in their clinical routine was an uneasy shift. The Conservative Dentistry Department matched each student with a partner from his or her own group. Students have no control over partner selection, and this might result in some being unhappy with the arrangement. Adding to the students' perceived disadvantage, they may get dominating, noncompliant partners who may further strain the partnership. Statements such

as "dissatisfied with partner," "lack of cooperation and understanding," "students must be compatible with each other," and "difficult to divide the sessions between partners" demonstrated weak links in clinical pairing. Uncooperative partners who do not move toward the same goal will also compromise any benefit of cooperative learning.

Clinical supervisors were rated as the highest useful item in facilitating the students to accept clinical pairing. This may be due to the students' respect for their teachers as role models⁹ and the ability of the clinical supervisors to coach the students on how to work in pairs. The researchers in that study also found that role modeling played a useful part in the process of helping dental students learn the knowledge, skills, and attitudes appropriate to clinical practice. In implementing clinical pairing, the clinical supervisors were briefed in advance on how to guide students during the clinical sessions. Thus, it was not surprising that clinical supervisors were ranked the highest, whereas auxiliary staff such as dental assistants were ranked the lowest.

In the dental faculty, a shortage of dental assistants has been an issue for quite some time; therefore, these students had rarely been assigned dental assistants during their patient treatment sessions. As a consequence, students may not know or appreciate the role of the dental assistant. With few auxiliary staff, the dental assistants would have been required to do other necessary tasks themselves, rather than helping out the students. Any additional duty, such as coaching/teaching students, would be considered a burden, and the student would likely be left out and not learn anything. A previous study found a lack of teaching and interaction between the dental assistants and students and concluded that teaching and interprofessional training are of central importance in helping dental students appreciate the role of dental assistants.¹⁰ Of the statements in our study regarding the degree of their success with clinical pairing, the students ranked "students work four-handed (close support)," "students learn from each other," and "patient treatment and clinical procedures are more easily executed" the highest, with a majority (more than 90 percent) selecting these as benefits of clinical pairing.

Interestingly, statements such as "stress is reduced for the student" and "more patients are seen" were ranked lower, with approximately 60 percent of the students rating these as satisfactory and very satisfactory. This may be related to dentistry being a stressful course in itself and students failing to understand that they can also learn indirectly from

their partner's patients. It is anticipated that students can actually see more patients with clinical pairing than they could working individually. Though similar types of work are carried out by both students, their individual patients can present different clinical situations, which may require different approaches. Also, if one partner were to commit an error in judgment or treatment, the other would learn from such mistakes and avoid making them when it was his or her turn to do the clinical operative work.

However, the majority (81.7 percent) of the students still perceived that fewer patients get treated when the students worked in pairs despite the opportunity to learn from all patients, including their partner's. In addition, 81.9 percent of the students felt that clinical pairing had increased their apprehension about meeting clinical requirements. Students were used to working individually with the allocated number of sessions, whereas with pairing the total numbers of sessions have to be shared/split with their partners. Therefore, it is expected that they will have the perception that fewer patients get treated. Because clinical pairing is a new experience, sharing the clinical sessions also imposes some degree of uncertainty on students in regards to meeting their clinical requirements. Since it is a new concept for these students, it is expected that they might have a negative perception of its implementation.

One question was designed to indirectly assess the students' acceptance of clinical pairing (Table 7), and the students indicated that they preferred to have a session working independently (this was presented as an alternative to working in pairs). These responses contradict their answers to the other questions about clinical pairing and can be explained by the fact that the students did not really understand the concept of clinical pairing or had not answered the questions honestly. The students were also asked for further suggestions on clinical pairing, and most of them requested that the system be more "flexible." They also stated that "if we need to split, please allow us to do so," indicating that students' low level of acceptance of clinical pairing still revolves around preferences for working independently. Other suggestions included statements such as the following: "should pair the good students with the weak ones so that they can learn from each other"; "session distribution should be equal between the clinician and the partner"; and "decrease the schedule so that students will enjoy working with the partner and also enjoy the learning process." (In view of the fact that clinical pairing resulted in fewer overall treatment sessions

available to the students as opposed to working individually, the schedule of clinical requirements has been adjusted accordingly, taking into consideration time saved by the assistance rendered.)

Conclusion

The benefits of clinical pairing may not be viewed in the same vein by both dental students and instructors. Q theme issues were perceived by students as the main advantage of clinical pairing, whilst P theme issues were viewed otherwise. The study also found that students may have some preconceived notions about pairing that may have affected their willingness to accept it. As a consequence, some reluctance was seen in their responses. Based on our findings in this study, further studies have been initiated to determine the students' perceptions of clinical pairing when they have been exposed to such a partnership from the very beginning of their clinical years.

Acknowledgments

This study was supported by a research grant (RG 100/09HTM).

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