IN BRIEF

- Identifies communication and working styles used by clinical dental students when working with nurses.
- Enables readers to gain an understanding of gender and ethnicity issues when communicating and working with dental nurses.
- Enables readers to gain an understanding of the development of communication skills and the importance of inter-professional education and shared training to improve communication in dental care.

Dental students interacting with dental nurses: an investigation of the role of gender and ethnicity in inter-professional communication and working styles

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Aim To examine the influence of dental students' gender and ethnicity on their perceptions of dental nurses' duties and upon their communication and working styles when interacting with dental nurses (DNs). **Method** A survey of clinical dental students attending Queen's University Belfast and University of Leeds. Students were invited to complete the 34 item Communication and Working Styles Questionnaire. The questionnaire assessed the students' perceptions of the duties of a DN and the students' communication and working styles. Factor analysis revealed two communication and working styles which were friendly and difficult styles, respectively. **Results** Two hundred and forty-eight students participated giving a response rate of 88%: 58% were female and 30% of students from Leeds were from various ethnic minority groups. The students' perceptions as to the duties of a DN were affected by university attended and ethnicity. The majority of students used friendly communication styles. The type of style used was determined by university attended, gender and ethnicity. Male students had higher mean scores for friendly working styles whereas students from minority ethnic groups had higher mean scores for gender-related communication style. Female students and students from minority ethnic groups had higher mean scores for items relating to teamwork. **Conclusions** This survey illustrates the different communication and working styles used by male and female and dental students from different ethnic backgrounds when interacting and working with DNs.

INTRODUCTION

In the arena of health care provision the joint issues of gender and race/ethnicity have been highlighted as central when ensuring equal access to care.[1] More recently gender and race have been perceived as important not only for those accessing but also for those providing health care.[1-3] During training and after qualification male and female, medical students and graduates from different racial/ethnic backgrounds stated that they had experienced sexism and racism during their medical training.[2-3] It seemed that the attitudes of teachers and senior colleagues were implicated in perpetuating perceptions of sexism and racism.[3] These findings suggested that a hierarchy of traditional professional attitudes existed and that women and those from minority ethnic groups were disadvantaged.[3] Describing such hierarchical attitudes and interactions as 'patriarchy', Sweet and Norman[4] suggested that gender issues remained central to the 'subordination of women in both nursing and medicine'. Examining the power relationships and social roles between doctor and nurse they[4] suggested that same-gender interaction (male doctor and male nurse) was one of equality. Zelek and Phillips[5] disagreed. They[5] proposed that difficulties arose within same-gender (female) doctor-nurse interactions. Supporting the earlier work of Gjerberg and Kjolsrod,[6] Zelek and Phillips[5] noted that a 'lack of traditional professional hierarchy'[5] caused problems for female doctors because women

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Table 1 Communication and Working Styles Questionnaire (CWSQ): scales (means, 95% confidence intervals and reliabilities) and items (means, 95% confidence intervals, and factor loadings)

Item		Cronbach's alpha	Factor loading	Mean (95%CI)
	Scale 1: Friendly communication style	0.62		22.47 (21.99, 22.91)
1	The best way to work with a DN is to be friendly.		0.45	4.57 (4.50, 4.64)
5	I would talk about personal problems with my DN.		0.55	2.08 (1.96, 2.20)
7	I think you should count on your DN as your friend.		0.56	3.35 (3.24, 3.49)
13	If there was friction or irritation between my DN and me, I would solve this by paying personal attention to her feelings.		0.43	3.40 (3.29, 3.51)
14	If there was friction or irritation between my DN and me, I would solve this by relieving the tension by humour.		0.58	3.19 (3.07, 3.31)
15	If there was friction or irritation between my DN and me, I would solve this by using the 'playful atmosphere' there can be between a dentist and a DN.		0.56	2.67 (2.55, 2.79)
20	I would rather employ a female than a male DN.		0.52	3.20 (3.05, 3.36)
	Scale 2: Gender-related communication style	0.60		14.44 (14.04, 14.85)
6	I think that talking about private matters with a DN would disturb working relationships.		0.52	3.06 (2.93, 3.19)
16	I think that there is often a flirting element in the working relationship between a male dentist and a female DN.		0.51	3.20 (3.06, 3.34)
17	In my opinion female DNs accept the leadership of a male dentist rather than the leadership of a female dentist.		0.64	3.10 (2.95, 3.24)
18	In my opinion the best working combination in a dental practice is a male dentist with a female DN.		0.73	2.60 (2.46, 2.75)
19	In my opinion the best working combination in a dental practice is a female dentist with a female DN.		0.33	2.47 (2.37, 2.58)
	Scale 3: Open communication style	0.53		12.59 (12.41,12.76)
8	I think that it would be good to have regular meetings with your DN.		0.52	3.62 (3.52, 3.71)
9	If something was bothering me about my DN's work I think I should talk about it with her.		0.78	4.46 (4.39, 4.53)
10	I think a DN should tell the dentist if something is bothering her when they work together.		0.74	4.50 (4.43, 4.58)
	Scale 4: Teamwork	0.30		14.02 (13.75, 14.29)
3	DN should know immediately, when her assistance is needed		0.41	3.68 (3.58, 3.79)
4	I always have to ask a DN, when I want her to do something for me		0.53	3.36 (3.21, 3.51)
11	I think that if something was bothering me when I am working with a DN, I should report it the practice manager or principal dentist.		0.47	3.61 (3.49, 3.72)
12	If a dentist makes suggestions as to how (s)he should work with his or her DN it may take a while until the DN accepts them		0.48	3.37 (3.27, 3.47)

doctors 'expected nurses to interact with all physicians equally'[5] whereas the nurses considered women doctors, because they were women, to be their equal.

Little research has examined sexism and racism in dentistry and still less has investigated the influence of gender and ethnicity upon the working interactions between dentists and dental nurses. Dentists and nurses work in close physical proximity with the patient in the surgery. Could this proximity have the potential to exacerbate or reduce perceptions of sexism and racial or ethnic differences? Since the working behaviours of doctors and dentists are different it was hypothesised that differences must also exist in their communication and working style preferences. This was thought to be due to the exclusivity of the dentist-dental nurse working interaction and the need for cooperative working and symmetrical communication styles.[7,8]

Men in the dental profession have, historically, been viewed as the 'boss' with women being trained as dental nurses, hygienists and therapists – all subservient and dependent upon the male dentist.[7] Unlike previous generations, more young women are entering the dental profession. Young female dentists have equivalent status to their male colleagues and expect to have equivalent communication and working experiences.[5] Recent studies,[7-8] however, have shown that far from being similar, the communication and working styles between female dentists and female nurses and between male dentists and female nurses are quite different. Female graduates felt at a disadvantage, believed they received less chair-side assistance, were fearful of being assertive and in an effort to get more assistance, became friendly with their nurses. This caused inconsistencies and difficulties in their working relationships – the female dentists felt that they were dentists first and expected to be treated in the same way as their male colleagues.[7-8] These findings suggested that during dental education dentists' perceptions of the dental nurse were formulated and consolidated. It may be hypothesised that their formulations were based on unhelpful stereotypes of the dental nurse as a 'dental housewife'[9] or 'hand-maiden'[5] to the dentist.

With the increased number of women and minority ethnic students[10-11] entering dentistry there is a clear need to

investigate the role of gender and ethnicity in inter-professional communication and working styles. The aim of this present study was to examine the influence of dental students' gender and ethnicity on their perceptions of dental nurses' duties and upon their communication and working styles when interacting with dental nurses.

METHOD

Sample

A convenience sample of all clinical dental students studying at Queen's University, Belfast (114) and the University of Leeds (161) were invited to take part. These two dental schools were purposively chosen; first, because the percentage of women attending these schools reflects the national UK proportion of female students attending medical and dental schools, and secondly because there are greater proportions of minority ethnic group students attending Leeds compared with Belfast.[10-11] In all other aspects the two dental schools were similar with regard to clinical training and practice. Ethical approval was obtained from the local ethics committees and written consent was obtained from all participating students.

The questionnaire

The first section of the questionnaire inquired of the dental students' university of study, their demographic characteristics (age, gender, and ethnicity[12]) and the demographic characteristics of the dental nurse who primarily assisted them on a daily basis.

The second section of the questionnaire was the Communication and Working Styles Questionnaire (CWSQ). The CWSQ was developed and constructed from a series of in-depth interviews with qualified dentists in Northern Ireland and the Netherlands.[7,8] The questionnaire was, subsequently, used as a survey tool to examine personal and practice characteristics as well as communication and working styles in dentists in Northern Ireland and the Netherlands. It was shown to have good internal consistency and validity.[8] The CWSQ is a self-complete questionnaire in two parts:

The first part of the questionnaire consisted of 14 yes/no items to assess the dental students' opinions as to the duties of a dental nurse. The questions included, for example, 'chair-side assistance', 'sending accounts' and 'cleaning the surgery'. The 14 individual items were collapsed into three groups in relation to clinical, administrative or cleaning activities. The first group of questions related to clinical dental nursing and included, 'chair-side assistance', four-handed dentistry', 'taking radiographs', 'developing radiographs' and 'dental health education'. A total score for clinical duties was computed. The scores ranged from 0 (no items checked) to 5 (all items checked). The second group of questions related to administrative duties and included, 'administration of the practice, 'ordering materials', 'making patient appointments', 'sending accounts', 'receiving patient payments' and 'sending and receiving laboratory work'. A total score for administrative duties was computed. The scores ranged from 0 (no items checked) to 6 (all items checked). The final group concerned cleaning duties and consisted of 'cleaning-up after the dentist', 'cleaning and sterilising instruments' and 'cleaning the practice'. A total score for cleaning duties was computed. The scores ranged from 0 (no items checked) to 3 (all items checked).

The second part consisted of 20 attitudinal statements concerning communication and working styles with dental nurses. The questions included, for example, 'the best way to work with a dental nurse is to be friendly' and 'I always have to ask a dental nurse, when I want her to do something for me'. The attitudinal statements were assessed on a 5-point Likert scale, varying from 1 (I disagree completely) through 3 (Neutral, no opinion, or not applicable to my situation) to 5 (I agree completely).

All the scores for the 20 communication and working styles attitudinal items were subjected to a principal components factor analysis – a method to cluster items together to form a consistent scale. In Table 1 the various individual items and scales are presented with their communication and working style labels together with their Cronbach's alpha as a measure of the reliability of the scale (internal consistency).

Four scales were found which explained 39% of the variance. Scale 1 was composed of Items 1, 5, 7, 13, 14, 15 and 20 and had an eigenvalue of 2.60. It explained 13% of the variance. Scale 2, with an eigenvalue of 2.23, was composed of items 6, 16, 17, 18 and 19. Scale 2 explained a further 11% of the variance. Scale 3 was composed of items 8, 9 and 10 had an eigenvalue of 1.67. It explained a further 8% of the variance. The final scale, Scale 4, had an eigenvalue of 1.38 and explained 7% of the variance (Table 1).

The items in the four scales seemed to describe different aspects of the communication and working styles perceived by the dental students. Scale 1 was, therefore, conceptualised as 'friendly communication and working style': Scale 2 was conceptualised as 'gender-related communication and working style': Scale 3 appeared to reflect an 'open' style of communication and Scale 4 was conceptualised as 'teamwork'. Scale 1 and Scale 2 demonstrated good internal consistency to allow for group comparisons.[13] Scales 3 and 4 were weaker scales and are described for completeness.

Administration of the questionnaire

Both in Belfast and Leeds the dental students were requested to meet with the researcher (CM^{c}W) to complete the questionnaire. The questionnaire was administered under examination

Table 2 Ethnicity of the dental student population

Ethnic minority or racial group[12] n(%)	Percentage of participating dental students n (%)
White	200 (82.0)
Mixed race	7 (3.0)
Indian	16 (7.0)
Pakistani	10 (0.4)
Other Asian	5 (2.0)
Black Caribbean	1 (0.4)
Chinese	2 (0.8)
Other ethnic group (Arabic, Hispanic)	11 (5.0)

conditions. CMcW was present at all times to answer questions but not to influence the students' responses.

Statistical analysis

The data were coded and analysed using SPSS v12. The data were subjected to Chi-squared analysis, t-tests and univariate analysis of variance.

RESULTS

Sample

Two hundred and forty-three dental students participated giving a response rate of 88%. The students were equally distributed between the three clinical years; 58% were women; 18% of the total sample population were from ethnic minority groups which included Mixed Race, Indian, Pakistani, Other Asian, Black-Caribbean, Chinese and other Ethnic Group (ie Arabic and Hispanic)[12] (Table 2). The mean age of the students was 22.12 years (95% CI: 21.94, 22.29). The gender make-up of the sample was the same as that for the proportions of UK male (41%) and female (59%) students entering medicine and dentistry in 2004.[11] In the UK 30% of students in 2004 entering medicine and dentistry were from minority ethnic groups.[11,12] Thirty per cent of students studying at Leeds stated that they were from minority ethnic groups.

Forty-seven per cent (114) of students were studying at Belfast and 53% (129) were at Leeds. There were equivalent proportions male and female students ($X^2[1] = 0.09$: P = 0.77) and students from each of the clinical years ($X^2[2] = 1.54$: P = 0.46) in the Belfast and Leeds samples. There were statistically greater proportions of students from minority ethnic groups studying at Leeds (30%) compared with Belfast (4%) ($X^2[1] = 29.68$: P < 0.001). Four of the dental nurses with whom the students interacted were male. Ninety-eight per cent of the dental nurses that the students worked with were white.

Duties of a dental nurse

Examining the individual duties, the majority of students stated that they were of the opinion that dental nurses' duties included 'chair-side assistance' (99%), 'four-handed dentistry' (96%), 'cleaning and sterilising instruments' (93%), 'cleaning-up after the dentist' (85%) and 'developing radiographs' (76%). Lower proportions of students felt that the dental nurses' duties included 'sending and receiving laboratory work' (33%), 'making patient appointments' (31%), 'dental health education' (29%), 'administration of the practice' (21%), 'taking radiographs' (12%) and 'sending accounts' (8%). Twenty-six per cent of students stated that dental nurses' duties included 'cleaning the practice'.

Table 3 Comparisons of dental nurses' duties by student gender and ethnicity

By gender:	Male (n=102)		Female (n=141)		
	Mean	(95%CI)	Mean	(95%CI)	
Clinical duties	3.16	(2.95, 3.37)	3.27	(3.09, 3.45)	F(1,242)= 0.63, p=0.43
Administrative duties	1.57	(1.17, 1.98)	1.58	(1.24, 1.93)	F(1, 242)= 0.01, p=0.98
Cleaning duties	2.19	(1.95, 2.31)	2.12	(1.97, 2.27)	F(1,242)= 0.01, p=0.93
By ethnicity:	**White (n=200)**		**Minority ethnic group (n=43)**		
	Mean	(95%CI)	Mean	(95%CI)	
Clinical duties	3.13	(3.02, 3.25)	3.29	(3.09, 3.45)	F(1,242)= 1.18, p=0.27
Administrative duties	1.29	(1.07, 1.52)	1.86	(1.38, 2.34)	F(1, 242)= 4.54, p=0.03
Cleaning duties	1.99	(1.89, 2.09)	2.25	(2.03, 2.46)	F(1,242)=4.62, p=0.03

[1] The duties of a dental nurse by university attended

Students studying at Leeds (3.31: 95%CI: 3.17, 3.45) had statistically significantly higher mean scores for being of the perception that dental nurses' duties included clinical work compared with Belfast students (3.01: 95%CI: 2.86, 3.16) (t = 2.79: P = 0.006). Although not statistically significant Leeds students had larger mean scores for being of the perception that dental nurses' duties included administrative work (1.57: 95%CI: 1.27, 1.86) compared with Belfast students (1.21: 95%CI 0.95, 1.47) (t = 1.78: P = 0.07) and for the perception that dental nurses' work also included cleaning duties (2.12: 95%CI: 2.00, 2.23) compared with Belfast students (1.95: 95%CI 1.81, 2.08) (t = 1.87: P = 0.06).

[2] The duties of a dental nurse by gender and ethnicity of dental student

Univariate analysis showed that students from ethnic groups had higher scores for the perception that the dental nurses' duties included administrative work and cleaning duties compared with the other students. Univariant analysis revealed no statistically significant interactions between gender and ethnicity (Table 3).

Table 4 Comparisons of communication and working styles by student gender and ethnicity

By gender:	Male (n=102)		Female (n=141)		
	Mean	(95%CI)	Mean	(95%CI)	
Friendly communication and working style	24.33	(23.70, 24.97)	21.09	(20.56, 21.64)	F(1, 242)= 57.93, p<0.001
Gender-related communication and working style	14.64	(14.01, 15.26)	14.01	(13.78, 14.84)	F(1,242)= 0.64, p=0.42
By ethnicity:	**White (n=200)**		**Minority ethnic group (n=43)**		
	Mean	(95%CI)	Mean	(95%CI)	
Friendly communication and working style	23.30	(22.23, 24.39)	22.28	(21.77, 22.78)	F(1, 242)= 2.85, p=0.09
Gender-related communication and working style	14.25	(13.80, 14.69)	15.37	(14.42, 16.32)	F(1,242)= 4.48, p=0.04

Communication and working styles

The mean overall score for friendly communication and working styles was 22.47 (95%CI: 21.99, 22.91). The mean overall score for gender-related communication and working style was 14.44 (95%CI, 14.04, 14.85).

[1] Communication and working styles by university attended

Students studying at Belfast (22.98: 95%CI: 21.63, 22.96) and Leeds (22.59: 95%CI: 21.97, 23.23) had similar mean scores for friendly communication style (t = 0.64: P = 0.52). No statistically significant difference in mean score for gender-related communication style was demonstrated between Belfast (14.52: 95%CI: 13.92, 15.12) and Leeds students (14.38: (95%CI: 13.83, 14.93), (t = 0.48: P = 0.63).

[2] Communication styles by gender and ethnicity of dental student

Univariate analysis showed that for Scale 1: friendly communication styles, male students had statistically significantly higher mean scores compared with female students. No other statistical significant interaction effects, for ethnicity or between gender and ethnicity for friendly communication styles, were revealed.

Dental students from minority ethnic groups had statistically significantly higher mean scores for Scale 2: gender-related communication styles, compared with white dental students. Univariate analysis did not reveal statistically significant interaction effects of gender, or gender with ethnicity for gender-related communication styles (Table 4).

Since Scale 3: open communication style and Scale 4: teamwork were overall weaker scales, the items that formed these scales were examined separately. With regard to gender of the dental student, female students had significantly higher mean scores for Item 10 ('I think a DN should tell the dentist if something is bothering her when they work together') (t = 2.27: P = 0.02) and Item 4 ('I always have to ask a DN, when I want her to do something for me') (t = 3.25: P = 0.001) compared with male dental students. Minority ethnic group students had significantly higher mean scores for Item 4 ('I always have to ask a DN, when I want her to do something for me') (t = 2.65: P = 0.01) and for Item 12 ('If a dentist makes suggestions as to how (s)he should work with her DN it may take a while until the DN accepts them') (t = 2.35: P = 0.02) compared with white students.

DISCUSSION

The aim of this study was to examine the influence of gender and ethnicity on the dental students' perceptions of dental nurses' duties and upon their communication and working styles when interacting with dental nurses. In order to achieve this aim two dental schools were deliberately chosen – Queen's University, Belfast and University of Leeds. These two schools were representative of the UK gender composition of dental school entrants[10-11] and Leeds was representative of the ethnic composition of students attending UK dental schools.[11,12]

The dental students recognised that the dental nurses' primary role was working at the chair-side with the dentist. Large proportions of students, however, believed that dental nurses' duties included 'administrative duties', 'making patient appointments' and 'cleaning the practice'. Although no gender differences were noted, students from minority ethnic groups were of the opinion that administrative and cleaning duties were part of the dental nurse's remit in general practice.

Nevertheless, and irrespective of gender or ethnicity, the majority of students were of the opinion that the dental nurse was there to cater for their professional needs – in Gibson *et al.*'s[9] formulation the students perceived the dental nurse as a 'dental housewife'. This 'unhelpful [*stereotyping*]'[14] of the dental nurse as 'dental housewife'[9] or 'hand-maiden'[5,15] according to Rudland and Mires, reflects the 'misconceptions' of the duties of the dental nurse held by society and is also to be expected if dentists are trained in isolation from their other health professional colleagues.[14] Since none of the clinical students from Belfast or Leeds experienced shared teaching and/or inter-professional training with dental nurses, it was hypothesised that their misconceptions could become more established with clinical training. Rudland and Mires[14] insist that it was the lack of shared teaching and inter-professional training which was of central importance to allow [*dental*] students to appreciate the significance of the role of the [*dental*] nurse in primary care.

Dental students, in general, had the tendency to use friendly communication and working styles when interacting with dental nurses with no differences in mean scores for friendly communication and working styles existed between Belfast and Leeds. Contradictory to expectations, it was the male students rather than the female students who predominately used friendly communication and working styles. Male students felt that the best way to work with a dental nurse was to be 'friendly', to count the dental nurse as 'a friend' and to use 'playfulness' and 'humour' to relieve tension between them. Everything about the male students' behaviour suggested that they adopted a 'flirting element'[7] in their communication and working interactions with dental nurses.

Earlier, Stein[15] had proposed that a 'doctor-nurse game' existed between physician and nurse. Stein[15] suggested that the doctor-nurse game was a carefully choreographed interaction in which the clinician appeared to be active and the nurse passive. In this game the nurse was often responsible for important recommendations but allowed the initiative to appear to come from the doctor. Do male students practise a form of the 'doctor-nurse game'?[15] It may be proposed that the qualified dental nurse who provides clinical advice and problem solving skills nourishes the male students' awareness of their professional self.[16] The re-enacting of the 'doctor-nurse game',[5] it is suggested, reinforces dental nurse stereotypes. Within the 'dental student-dental nurse game' there is no merging of professional roles – the dental nurse remains tied to her stereotypical 'dental housewife' image,[9] passive and subordinate to the needs of the male dental student.

Female students were unable to adopt equivalent friendly communication and working strategies, however, they believed that communication between nurse and dentist should be open, with the nurse being able to say if anything was bothering her. Nevertheless they perceived difficulties when working with nurses – for instance the female students felt that they 'always have to ask a DN, when I want her to do something for me'.

It has been suggested that when women professionals interact that there is the potential for a communication mismatch. This is thought to be a consequence of the nurses' desire for cooperation and the women doctor/dentist's wish for professional hierarchy. In this atmosphere, all attempts at cooperative working evaporate with female doctors or dentists feeling unfairly treated and women nurses feeling unappreciated. The findings here would tend to indicate that a potential communication mismatch exists between the women students and nurses.[5,17] It is proposed that when the women students felt they are being treated differently to the men, when they felt they 'always had to ask for help', they perceived that they were unfairly treated.[6,18]

Students from minority ethnic groups used friendly communication and working styles when communicating and interacting with dental nurses. Reasons for perceptions of awkwardness may have been related to their greater uncertainty when interacting with women from another cultural group.[19] The students from minority ethnic groups were being asked to cope not only with the wish to be thought of as a dentist but also they had to contend with cross-cultural factors which had the potential to interfere with their communications. Green *et al.*[19] suggested the need for 'cross-cultural medical education' to increase awareness of ethnicity upon health outcomes when caring for patients from different ethnic minority groups. Their[19] approach is based on knowing more about people's social histories which allows participants to gain an understanding of each other. This procedure has some merit when considering the educational experiences of dental students from minority ethnic groups. Adopting Green *et al.*'s[19] framework would allow all dental students and dental nurses to have a greater understanding of the other's life and working experiences and thus reduce difficulties in communication and working styles.

There are limitations to this survey of dental students in Belfast and Leeds. The first limitation is in relation to the use of a convenience sample of dental students. The comparative nature of the sample reduces the kinds of inferences which may be extrapolated from the findings for dental education in general. Secondly, the CWSQ operated well for two of the four identified factors. The reliability was good for friendly and gender-related communication and working styles. The reliability, however, was poor for open communication and working style and teamwork. While this may have been due to the inconsistency of experience of working with a dental nurse, development of the scale would be necessary to improve the psychometric properties for future use. Nevertheless, despite this limitation, the CWSQ was able to differentiate between male and female students' and between white and minority ethnic group students' communication and working styles and performed well in this regard.

Despite these limitations the survey demonstrated the various communication and working styles used by dental students when interacting with dental nurses. It was suggested that a disparity existed between dental students and dental nurses based on social stereotypes of the image of the nurse in practice and a wish for professional hierarchy.

In order to promote cooperative working it is suggested that dental educators should consider inter-professional training in dentistry.[17] Inter-professional training would allow dental students to acquire knowledge of the dental nurses' duties and working experiences, to develop appropriate communication styles and working practices as well as appreciating the problem solving skills of the dental nurse. Shared teaching and inter-professional training could have the potential to promote cooperative working in the practice of dentistry.

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