

Peer Reviewed

Evaluation of a workshop to develop dental undergraduates' behaviour change conversation knowledge and confidence.

Marc LE Edwards, BSc(Hons), MSc., PhD.¹ , Shamira McKenna, BSc, MSc² , Maria Hussain¹

¹ Centre for Dental Education, Queen's University Belfast, ² School of Psychology, Queen's University Belfast

Keywords: behaviour change, disease prevention, motivational interviewing, pedagogy

<https://doi.org/10.58541/001c.143157>

Journal of the Irish Dental Association

Introduction

The General Dental Council's Safe Practitioner framework of behaviours and outcomes for dental professional education outline the need for dental undergraduates to learn evidence-based approaches to clinical practice. The Dental RECUR Brief Negotiated Interview (DR-BNI) is an effective oral health behaviour change intervention that draws upon psychological frameworks of disease prevention, behaviour change science, and patient-facing communication skills. Training in this approach involves developing participants' knowledge of childhood caries, and confidence applying personalised preventive advice to clinical practice via supervised role-play.

Materials and Methods

This study explored the effectiveness of a DR-BNI training workshop on developing dental undergraduates' behaviour change conversation knowledge and confidence. Seventeen participants completed a pre-post evaluation which assessed their knowledge of DR-BNI-related topics and confidence in applying relevant skills to clinical practice.

Results

Participants' knowledge of all topics including the development of dental caries in children, motivational interviewing, and behaviour change theory significantly increased following the workshop. Participants' confidence in applying skills for delivering a behaviour change conversation with a dental patient also significantly increased.

Conclusion

The DR-BNI represents a useful model for developing dental undergraduates' behaviour change conversation knowledge and confidence.

INTRODUCTION

The relevance and value of behavioural sciences in dentistry has been increasingly recognised in undergraduate curricula in recent decades.^{1,2} The latest General Dental Council's (GDC) Safe Practitioner framework of behaviours and outcomes for dental professional education outlines the need for graduates to be able to: "Explain and evaluate psychological and sociological concepts and theoretical frameworks of health, illness, behavioural change and disease and how these can be applied in clinical practice (C1.7)".³ Additionally, they must be able to: "Provide patients/carers with comprehensive, personalised preventive advice, instruction and intervention in a manner which is accessible, promotes self-care and motivates patients/carers to comply with advice and take responsibility to maintain and improve oral health (C2.5.1)".

Developing appropriate and engaging teaching methods to meet these objectives can be a challenge, especially given an educational context in which some undergraduate

dental students view communication skills and patient adherence components of the behavioural sciences curriculum to be 'more boring' and 'less relevant' than their other, more clinical-based, training.⁴ A possible reason for this is that there is typically less teaching time dedicated to behavioural sciences topics in the dental education curriculum,⁵ and few dental schools have a specifically appointed lecturer with psychology expertise to deeply integrate those topics with other curricular themes in dedicated modules.

While some dental schools may teach dental undergraduates individual evidence-based behavioural approaches to disease prevention, such as the Irish Health Service Executive (HSE) Making Every Contact Count Programme, few actively train students in specific behavioural interventions. Discussions centred on behavioural modification represent one preventive strategy employed by dental care practitioners to encourage patients to adopt healthier habits and routines. Motivational interviewing (MI) is a behaviour change conversation technique that involves assessing individuals' readiness to change, enhancing their self-efficacy, and fa-

cilitating adherence to healthcare recommendations.⁶ Dentists generally do not have MI as part of their compulsory training, but may learn this skill as part of continuing personal development. Recent research has highlighted the potential benefits of behaviour change conversations in promoting better oral health, suggesting that they can be effective in managing dental diseases,⁷ enhancing patient motivation to adopt healthier oral hygiene behaviours,⁸ and building clinicians' communication strategies to improve patient engagement.⁹

Despite the benefits of behaviour change conversations in the promotion of better oral health, focus groups involving various members of the dental team in England (dentists, practice managers, dental therapists/hygienists, dental nurses) report numerous challenges to supporting dental patients' behaviour change.¹⁰ In particular, many struggle with conversational elements, including building rapport and expressing empathy with parents of children with tooth decay. Instead, they report mostly relying on an information-giving approach, contrary to growing evidence that motivational approaches to behaviour change (i.e., eliciting change) can be especially effective at preventing oral disease in children.¹¹

Training dental students in the application of behaviour change skills provides a strong educational tool based on psycho-educational theories.¹² Theory-informed training can effectively increase dental care professionals' motivation to discuss behaviour change with patients.¹³ Although numerous studies have assessed the impact of general communication training on dental undergraduates' ability to interact with patients effectively,¹⁴⁻¹⁶ to the best of our knowledge, no studies to date have evaluated the training of dental students in a specific behaviour change conversation intervention.

The Dental RECUR Brief Negotiated Interview (DR-BNI) is a behavioural intervention for caries prevention, with strong evidence of its effectiveness (29%) in the reduction of new dental caries in children aged seven to nine years.¹¹ The approach involves dental nurses applying motivational interviewing skills and behaviour change techniques in a 30-minute behaviour change conversation to motivate parents of children with caries to develop one or two personalised goals based on national preventive recommendations.¹⁷

The DR-BNI draws upon frameworks of behaviour change science, clinical communication skills, and disease prevention. As such, it has strong potential as an educational model for dental undergraduates to develop knowledge and competency in engaging a dental patient in a behaviour change conversation. DR-BNI-related communication skills could be implemented by dental students during both simulated and real interactions with dental patients throughout their training and in future practice. There is flexibility in how, and to whom, the DR-BNI is taught; a DR-BNI hands-on workshop has been successfully delivered to behavioural scientists, academics, and professionals.¹⁸ Typically, DR-BNI training involves teaching participants about the problem of child dental caries, motivational interviewing, behaviour change science, and

information on how to deliver the DR-BNI in clinical practice. This is followed by supervised role-play, during which participants practice DR-BNI skills and receive feedback from a DR-BNI trainer. All components of the DR-BNI training could be readily adapted for delivery to dental undergraduates, as students are regularly taught information and skills that they then implement in practice under the supervision of an academic or clinician.

Brief hands-on workshops delivered to a small number of participants can be effective as a teaching and learning methodology for communication skills training,¹⁹ knowledge and confidence development,²⁰ and as a means of identifying challenges for informing future practice.²¹ As the DR-BNI training has not previously been delivered to dental undergraduates, a brief hands-on workshop format would help to identify the potential benefits and challenges of adapting it for this demographic before it can be evaluated more widely within the undergraduate behavioural sciences curriculum.

Therefore, this study aimed to develop dental undergraduates' behaviour change conversation skills in a training workshop on the DR-BNI.

METHOD AND MATERIALS

The study was reviewed and approved by the Faculty of Medicine, Health and Life Sciences Research Ethics Committee (Faculty REC) in accordance with the Proportionate Review process at Queen's University Belfast (Faculty REC Reference Number: MHLS 24_121).

PARTICIPANTS

Undergraduate dental students across years one to five were invited to take part in an in-person behaviour change conversation skills workshop via an invitation email. Participants were 17 dental undergraduates enrolled in the five-year Bachelor of Dental Surgery (BDS) programme at Queen's University Belfast during the 2023-2024 academic year who had registered to participate in the DR-BNI workshop via an online form. Participants were between 19 and 26 years of age, and none had completed a previous degree. Participants were comprised of students from year one (52.9%), year two (5.9%), year four (35.3%) and year five (5.9%) of their studies. There were a range of ethnicities, with most identifying as 'White British' (17.6%), 'Irish' (17.6%), 'Any other ethnic group' (17.6%), or 'Pakistani' (11.8%). Participants were compensated with a £10 Amazon voucher and provided with a completion certificate following attendance at the workshop.

Participants' identifiable information, including email addresses, were kept confidential and stored in a password-encrypted university database. When participants completed the consent form, they were asked to create a non-identifiable unique ID code, which they used when completing all questionnaires.

PROCEDURE

PRE-EVALUATION

Participants who consented to participate in the evaluation of the DR-BNI training workshop were sent a 'pre-evaluation questionnaire' via Microsoft Forms in advance to be completed and returned to the Chief Investigator before the workshop. This questionnaire collected participants' demographic information, their current knowledge of DR-BNI-related topics such as oral health behaviour change and motivational interviewing, and how confident they are in applying relevant skills to clinical practice. This questionnaire also collected qualitative data relating to participants' expectations for the training.

WORKSHOP

During the 90-minute workshop, a behavioural scientist trained in the DR-BNI intervention (the Chief Investigator, ME) delivered a brief talk on how it was developed and evaluated. This was followed by hands-on training including supervised role-play facilitated by the Chief Investigator (ME) and the Co-Investigator (MH).

The role-play involved participants working in pairs, with one participant role-playing as a dental student delivering the DR-BNI, and the second participant role-playing as a parental caregiver receiving the DR-BNI. Finally, there was a whole-group discussion during which participants shared whether the training met their expectations and if they felt they had successfully met the learning objectives.

POST EVALUATION

A 13-item post-evaluation questionnaire was developed using the four-level Kirkpatrick Model^{22,23} to assess: how engaging and relevant participants found the training (Level 1: Reaction); the extent to which they acquired the intended knowledge, skills, and confidence (Level 2: Learning); the extent to which they were able to apply what they learned (Level 3: Behaviour); and, whether training contributed to the learning objectives of the dental undergraduate curriculum (Level 4: Results). This questionnaire was completed by participants one week following the workshop to allow time for participants to practice using MI communication skills with either a dental patient or friend/family member.

RESULTS

POST-TRAINING EVALUATION

Participants indicated on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree) the extent to which they agreed with the statements, with participants either somewhat or strongly agreeing with all post-training eval-

uation questionnaire items ($M = 4.31$, $M = 5.00$) across all four domains of Kirkpatrick's Model ([Table 1](#)).

PRE-POST EVALUATION: KNOWLEDGE

Participants reported their knowledge of DR-BNI-related topics on a five-point Likert scale (1 = not at all knowledgeable, 5 = extremely knowledgeable), with a paired-samples t-test finding that participants' knowledge of all DR-BNI-related topics and skills had significantly increased following the training ([Table 2](#)).

PRE-POST EVALUATION: CONFIDENCE

Participants reported their confidence in applying DR-BNI-related skills to clinical practice on a five-point Likert scale (1 = not at all confident, 5 = extremely confident), with a paired-sample t-test finding that participants' confidence had significantly increased following the training ([Table 3](#)).

DISCUSSION

This study aimed to evaluate the effectiveness of a DR-BNI workshop on dental undergraduates' behaviour change conversation knowledge and confidence, and to identify the benefits and challenges to embedding training in this approach within the undergraduate behavioural sciences curriculum. The findings of this study demonstrate the potential of DR-BNI training to enhance dental undergraduates' knowledge of, and confidence in, delivering a behaviour change conversation with a dental patient.

The results of this study may benefit both dental educators and students. The learning objectives of DR-BNI training align closely with those of the GDC's safe practitioner framework, meaning that this may be an effective educational tool for developing students' communication skills for delivering personalised preventive advice, and their knowledge and application of theoretical frameworks of health, illness, behavioural change and disease. Previous research in this area has recommended better equipping dental students with the necessary tools to adopt a more holistic and person-centred approach to improving patient health outcomes.²⁴ Incorporating DR-BNI training more comprehensively within the dental curriculum has the potential to effectively address the existing gaps in students' exposure to behavioural sciences and, more specifically, oral health behaviour change conversations.

The potential benefits of DR-BNI training extend beyond the immediate educational context to broader public health outcomes. Equipping future dental practitioners with communication skills to effectively engage patients in an oral health behaviour change conversation could result in reduced disease prevalence. Increasingly, non-judgemental and empathetic communication skills are considered effective at fostering a deeper understanding of patients' psychological and social contexts, ultimately promoting more equitable and patient-centred care to prevent disease progression.²⁵

Item	Kirkpatrick level	M	SD	Mode response
I was satisfied with the DR-BNI training overall.	Level 1 (Reaction)	4.88	0.34	Strongly agree
I successfully learned how to deliver an oral health behaviour change conversation.	Level 2 (Learning)	4.69	0.48	Strongly agree
I feel confident I can now deliver a behaviour change conversation with a dental patient	Level 3 (Behaviour)	4.31	0.48	Somewhat agree
This workshop provided content that is relevant to my current training.	Level 4 (Results)	4.94	0.25	Strongly agree
The training materials provided me with enough information to deliver the DR-BNI.	Level 2 (Learning)	4.44	0.89	Strongly agree
I would recommend the workshop to others.	Level 1 (Reaction)	4.88	0.34	Strongly agree
The workshop was a worthwhile use of my time.	Level 1 (Reaction)	4.88	0.34	Strongly agree
I am already seeing positive results from the workshop.	Level 4 (Results)	4.06	0.77	Somewhat agree
I am expecting positive results from the workshop in the future.	Level 4 (Results)	4.94	0.25	Strongly agree
The information in the workshop is applicable to my training	Level 4 (Results)	5.00	0.00	Strongly agree
The presentation style of the facilitator(s) contributed to my learning experience.	Level 2 (Learning)	4.81	0.40	Strongly agree
I gained useful patient-facing communication skills in the workshop.	Level 2 (Learning)	4.88	0.50	Strongly agree
I understood what was expected of me during the workshop.	Level 1 (Reaction)	4.69	0.48	Strongly agree

Table 1. Participants' post-evaluation agreement with statements about the training, including relevant Kirkpatrick Model evaluation level.

Topic	Pre/post	M	SD	t	p
The development of dental caries in children	Pre	3.18	1.11	-6.619	<0.001*
	Post	4.50	0.63		
Oral health prevention in children	Pre	3.25	1.06	-4.612	<0.001*
	Post	4.56	0.63		
Oral health behaviour change	Pre	2.38	0.96	-7.746	<0.001*
	Post	4.38	0.89		
Behaviour change theory	Pre	1.81	0.83	-9.604	<0.001*
	Post	3.94	0.93		
Motivational interviewing	Pre	1.69	0.95	-8.733	<0.001*
	Post	4.06	0.93		
Brief negotiated interviewing	Pre	1.44	0.73	-8.359	<0.001*
	Post	3.63	0.81		
Communication skills for exploring readiness to change	Pre	2.06	1.00	-7.342	<0.001*
	Post	4.13	0.81		
Behaviour change conversations	Pre	2.44	0.81	-7.348	<0.001*
	Post	3.94	0.77		

Table 2. Pre-post training knowledge.

Note: *significant at $p < 0.05$.

Topic	Pre/post	M	SD	t	p
General communication with a dental patient	Pre	3.69	0.95	-2.150	0.024*
	Post	4.13	0.72		
Engaging a dental patient in a behaviour change conversation	Pre	2.25	1.13	-6.260	<0.001*
	Post	3.94	0.77		
Using motivational interviewing skills	Pre	1.88	0.96	-8.944	<0.001*
	Post	3.89	0.81		
Delivering a brief negotiated interview	Pre	1.50	0.63	-10.954	<0.001*
	Post	3.50	0.63		
Communication skills for exploring readiness to change	Pre	2.25	1.29	-5.653	<0.001*
	Post	4.00	0.63		
Participating in a supervised role-play	Pre	3.00	1.03	-5.582	<0.001*
	Post	4.13	0.81		

Table 3. Pre-post training confidence.

Note: *significant at $p < 0.05$.

LIMITATIONS AND FUTURE DIRECTIONS

The DR-BNI training was delivered as a standalone workshop rather than embedded within the broader behavioural science curriculum. Achieving competence in communication and interpersonal skills requires the iterative process of experiencing, reflecting, thinking, and acting.⁸ However, this may not have been possible in the week between the workshop and the post-evaluation questionnaire in the present study. The condensed format of a workshop may have limited the depth of training, leaving gaps in areas such as motivational interviewing and the full application of behaviour change science to the management of children's oral health. Delivering the training as part of a combined lecture and workshop series in a behavioural science module across an academic term with formative and summative assessment of skills would allow for iterative learning and practice.

Participants were mostly comprised of students from the first two years of their training. While these students have fewer 'real' clinical/patient interactions than year three-five students, patient-facing communication skills and behavioural sciences are taught during these years and they frequently have opportunities to practice communication skills in simulated scenarios, so did have some knowledge and experience in advance of participation (albeit to a lesser extent than their senior colleagues).

Future studies may wish to examine the practical application of DR-BNI-related skills in real versus simulated dental patient interactions. The use of fidelity monitoring checklists or structured proformas could provide deeper insights into how effectively students apply these skills in

practice. Additionally, exploring the long-term impact of such training on patient outcomes and health behaviours would further validate the public health significance of incorporating the DR-BNI approach.

Despite dental caries being the most preventable childhood disease, there remains a significant health burden on individuals, their families, and the National Health Service (NHS), with 25% of five-year-old children affected.¹⁷ It is vital that dental students are trained in, and are confident delivering, a range of approaches to prevent and treat this disease by the time they begin practising, whether as a 'safe beginner' (as per the GDC), or as an independent provider (as per the Dental Council of Ireland).

CONCLUSION

Training dental undergraduates in effective evidence-based approaches to prevention has the potential to benefit both students in the present and patients in the future. Behaviour change conversations are ideal for teaching students about psychological frameworks of health, illness, and disease, and how to provide personalised preventive advice in clinical practice. The DR-BNI intervention has potential as an educational model for developing dental undergraduates' behaviour change conversation skills; future research should investigate the utility of its inclusion within the dental undergraduate curriculum.

Submitted: March 19, 2025 IST. Accepted: May 21, 2025 IST.

Published: August 22, 2025 IST.

REFERENCES

1. Piko BF, Kopp MS. Paradigm shifts in medical and dental education: behavioural sciences and behavioural medicine. *Eur J Dent Educ.* 2004;8(Suppl. 4):25-31. doi:[10.1111/j.1399-5863.2004.00319.x](https://doi.org/10.1111/j.1399-5863.2004.00319.x)
2. Schou L. The relevance of behavioural sciences in dental practice. *Int Dent J.* 2000;50:324-332. doi:[10.1111/j.1875-595X.2000.tb00582.x](https://doi.org/10.1111/j.1875-595X.2000.tb00582.x)
3. General Dental Council. The Safe Practitioner: A framework of behaviours and outcomes for dental professional education. 2023. Accessed October 2024. <https://www.gdc-uk.org/news-blogs/news/detail/2023/11/09/gdc-launches-new-safe-practitioner-framework-and-consultation-outcome-report>
4. Neville P, Waylen A. That “mushy boxed fog feeling”: dental students' evaluations of the social and behavioural sciences in dental education. *MedEdPublish.* 2016;5:144. doi:[10.15694/mep.2016.000144](https://doi.org/10.15694/mep.2016.000144)
5. Centore L. Trends in behavioral sciences education in dental schools, 1926 to 2016. *J Dent Educ.* 2017;81(8):66-73. doi:[10.21815/JDE.017.009](https://doi.org/10.21815/JDE.017.009)
6. Hinz JG. Teaching dental students motivational interviewing techniques: analysis of a third-year class assignment. *J Dent Educ.* 2010;74(12):1351-1356. doi:[10.1002/j.0022-0337.2010.74.12.tb05010.x](https://doi.org/10.1002/j.0022-0337.2010.74.12.tb05010.x)
7. Chan CC, Chan AK, Chu CH, Tsang YC. Theory-based behavioral change interventions to improve periodontal health. *Front Oral Health.* 2023;4:1067092. doi:[10.3389/froh.2023.1067092](https://doi.org/10.3389/froh.2023.1067092). PMID:36762002
8. Gillam DG, Yusuf H. Brief motivational interviewing in dental practice. *Dent J (Basel).* 2019;7(2):51.
9. Gallagher JE, Godson JH, Marshman Z. How to have healthy conversations: contemporary evidence and behaviour change tools in support of delivering better (oral) health. *Prim Dent J.* 2024;13(1):32-37. doi:[10.1177/20501684241230836](https://doi.org/10.1177/20501684241230836)
10. Kitsaras G. Dental teams struggle with behaviour change conversations: focus group findings. Conference abstract presented at: 2024 IADR/AADOCR/CADR General Session and Exhibition; March 2024; New Orleans, Louisiana, USA.
11. Pine CM, Adair PM, Burnside G, et al. Dental RECUR randomized trial to prevent caries recurrence in children. *J Dent Res.* 2020;99(2):168-174. doi:[10.1177/0022034519886808](https://doi.org/10.1177/0022034519886808)
12. Rutter L, Duara R, Vinall-Collier KA, et al. Experiences of newly qualified dentists in delivering oral health advice to parents/caregivers of young children – challenges and solutions. *Front Oral Health.* 2023;4:1079584. doi:[10.3389/froh.2023.1079584](https://doi.org/10.3389/froh.2023.1079584). PMID:37273662
13. McGoldrick PM, Pine CM, Mossey PA. Teaching dental undergraduates behaviour change skills. *Eur J Dent Educ.* 1998;2(3):124-132. doi:[10.1111/j.1600-0579.1998.tb00047.x](https://doi.org/10.1111/j.1600-0579.1998.tb00047.x)
14. Mathew T, Shetty A, Shetty C, Narasimhan D, Shetty S, Hegde MN. Comparison of communication skills between undergraduate dental students with and without prior training in effective communication. *J Health Allied Sci NU.* 2015;5(2):8-11. doi:[10.1055/s-0040-1703880](https://doi.org/10.1055/s-0040-1703880)
15. Buduneli N. Communication skills of the clinician and patient motivation in dental practice. *Curr Oral Health Rep.* 2020;7:202-207. doi:[10.1007/s40496-020-00273-3](https://doi.org/10.1007/s40496-020-00273-3)
16. Khalifah AM, Celenza A. Teaching and assessment of dentist-patient communication skills: a systematic review to identify best-evidence methods. *J Dent Educ.* 2019;83(1):16-31. doi:[10.21815/JDE.019.003](https://doi.org/10.21815/JDE.019.003)
17. Public Health England. Delivering better oral health: an evidence-based toolkit for prevention. 2021. Accessed October 2024. <https://www.gov.uk/government/publications/delivering-better-oral-health-an-evidence-based-toolkit-for-prevention>
18. Edwards M, Adair P, Pine C, McKenna S, McCabe D. Parenting intervention for caries prevention: The Dental Recur Brief Negotiated Interview (DR-BNI). Conference hands-on workshop presented at: 2024 IADR/AADOCR/CADR General Session & Exhibition; March 13, 2024; New Orleans, Louisiana, United States.
19. Bylund CL, Brown RF, di Ciccone BL, et al. Training faculty to facilitate communication skills training: development and evaluation of a workshop. *Patient Educ Couns.* 2008;70(3):430-436. doi:[10.1016/j.pec.2007.11.024](https://doi.org/10.1016/j.pec.2007.11.024)

20. Admane MR, Mondhe PJ. Skill development of students through hands-on workshop. *Journal of Engineering Education Transformations*. 2021;34:250. doi:[10.16920/jeet/2021/v34i0/157151](https://doi.org/10.16920/jeet/2021/v34i0/157151)
21. Ørngreen R, Levinsen K. Workshops as a research methodology. *The Electronic Journal of e-learning*. 2017;15(1):70-81.
22. Kirkpatrick D, Kirkpatrick J. *Transferring Learning to Behavior: Using the Four Levels to Improve Performance*. Berrett-Koehler Publishers; 2005.
23. Kirkpatrick D, Kirkpatrick J. *Evaluating Training Programs: The Four Levels*. 3rd ed. Berrett-Koehler Publishers; 2006.
24. Neville P, Waylen A. Why UK dental education should take a greater interest in the behavioural and social sciences. *Br Dent J*. 2019;227(8):667-670. doi:[10.1038/s41415-019-0809-2](https://doi.org/10.1038/s41415-019-0809-2)
25. Javed MQ, Ahmad Z, Muhammad M, Ali K, Riaz A, Glanville R. Beyond the drill: understanding empathy among undergraduate dental students. *Eur J Dent Educ*. 2025;29(1):116-123. doi:[10.1111/eje.13054](https://doi.org/10.1111/eje.13054)