

Teaching brief motivational interviewing to Year three medical students

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OBJECTIVES In 2005, the authors developed and tested a curriculum to teach Year 3 Yale University medical students a behaviour change counselling approach called 'brief motivational interviewing' (BMI). Brief motivational interviewing is a patient-centred approach designed to promote changes in patient behaviour within the time constraints imposed by a busy medical practice.

METHODS Standardised patients/instructors delivered the curriculum within a single 2-hour training episode using a teaching acronym called 'CHANGE' to promote the students' learning. The authors used a pretest, post-test and 4-week follow-up design to assess students' BMI skills (as measured by the Helpful Response Questionnaire), knowledge and attitudes toward the approach.

RESULTS Students successfully increased their use of BMI-consistent behaviours, primarily by increasing the frequency and depth of their reflections and by reducing the frequency with which they incorporated communication roadblocks and closed questions into their responses (all *P*-values ≤ 0.05). Students also showed increases in BMI knowledge, interest in the approach, confidence in their ability to use BMI, and commitment to incorporating BMI skills into their future medical practice (all *P*-values ≤ 0.05).

CONCLUSIONS The findings suggest that Year 3 medical students can learn basic BMI skills and

knowledge and develop positive attitudes toward the approach within a relatively short period of time. The authors discuss the study's limitations and future directions for teaching students BMI.

KEYWORDS *students, medical; teaching/*methods; education, medical, undergraduate/*methods; curriculum; motivation; interviews; attitude of health personnel; communication; clinical competence/standards.

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INTRODUCTION

Communication skill development has become a major focus of medical education globally. The Liaison Committee on Medical Education (LCME),¹ the Association of American Medical Colleges (AAMC),² and consensus among international experts who teach and assess communication skills in medical schools³ have highlighted the importance of educating medical students in how to communicate with patients about their medical illnesses and related problems. This education typically focuses on the development of patient-centred interviewing skills in which students learn how to empathically understand patients' views of their problems and related biopsychosocial concerns and encourage them to collaboratively participate in the medical decision-making process.^{4,5}

Because the management and prevention of many medical conditions such as heart disease, diabetes, obesity, asthma and sexually transmitted diseases/HIV involve talking with patients about behaviours that necessitate change (e.g. diet, exercise, smoking, alcohol and drug use, medication adherence, sexual practices), interest in developing

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Overview

What is already known on this subject

Counselling patients in behaviour change is necessary in medical practice. Brief motivational interviewing (BMI) is an evidence-based behaviour change counselling approach developed for medical settings.

What this study adds

A single-session curriculum to teach Year 3 medical students BMI resulted in a significant increase in their use of BMI-consistent behaviours and a decrease in use of BMI-inconsistent behaviours.

Suggestions for further research

Future BMI curriculum evaluation studies should include control groups, longer follow-up assessment and carefully coded samples of students' skills within real-patient encounters, and should attempt to link BMI proficiency to specific patient behavioural change targets.

effective patient-centred approaches for behaviour change counselling within health care settings has grown over the past decade.⁶ One approach that has been adapted successfully for use in health care settings is 'motivational interviewing' (MI).⁷ Motivational interviewing is a patient-centred, directive counselling approach that develops the patient's intrinsic motivation to change targeted behaviours through the simultaneous strategic evocation and strengthening of change talk (i.e. self-statements that support change) and skilful handling and reduction of patient resistance to change. The approach emphasises reflective listening and open questioning, collaboration, support of patients' autonomy and self-efficacy, and elicitation of change talk. Combined, these characteristics embody the 'spirit' or style in which doctors interact with their patients as they help them develop their commitment to behaviour change. Evidence for the effectiveness of MI in treating alcohol, drug and other problem behaviours has been well established in randomised clinical trials.⁸

Given the time constraints of busy medical practices, Rollnick and colleagues developed a brief motiva-

tional interview (BMI) to make MI appropriate for use in health care settings by doctors and other health care professionals.⁹ The approach takes 5–15 minutes to carry out and involves an initial establishment of rapport between the doctor and patient using open questions, reflections and summaries to understand the patient's health concerns, related behavioural difficulties and behaviour change goals. Within the context of this rapport-building and information-gathering phase, the doctor uses strategies to determine the patient's motivation for changing identified health-related behaviours. For example, the doctor might ask a series of open-ended questions to determine the level of importance a patient gives to changing behaviours and his or her confidence in approaching those changes, using 10-point scaled rulers. The doctor then asks questions designed to build the patient's motivation for change while reflecting the patient's perspective and avoiding direct confrontation or unsolicited direction or health education. Next, the doctor and patient collaboratively determine the patient's behaviour change priorities and work toward identifying a change plan appropriate to the patient's interests and capabilities. The transaction typically culminates in a summary of what the patient intends to accomplish behaviourally. Brief motivational interviewing has been found to be effective in improving weight control programme behavioural adherence, glucose control and weight loss outcomes among type 2 diabetes patients,^{10,11} increasing physical activity and exercise energy expenditure among cardiac rehabilitation patients,¹² and helping patients change problematic behaviours related to hypertension.¹³

Reports on MI or BMI curriculum development efforts and their effectiveness in teaching medical students BMI skills are sparse. Brown and Oriol¹⁴ have described an elective 7-session, 14-hour programme in which they taught 21 Year 1 medical students MI using didactics, role-play demonstrations and simulated patient practice exercises with performance feedback. They anecdotally reported increasingly positive pre- to postcurriculum student regard for MI and confidence in applying MI techniques. Poirier and colleagues¹⁵ taught MI to 42 Year 1 medical students over 5 2-hour sessions in conjunction with instruction in clinical examination and history taking. A multidisciplinary team, consisting of an internist, a psychiatrist and a psychologist, delivered the curriculum to 1 of 3 equally sized student groups, respectively. Using self-report measures within a pre/post design, the investigators documented significant increases in knowledge about MI and confidence in using the approach to promote health

behaviour change. The study did not include assessment of the students' specific use of MI techniques. We are not aware of any other evaluative reports in the literature on teaching MI or BMI to medical students.

At the Yale University School of Medicine, we have been teaching medical students patient-centred communication skills with real and standardised patients (SPs) through all 4 years of the curriculum. Although students have been able to use these skills to establish rapport and build trust with patients, they have often expressed concern about not knowing how to proceed in the interview after they have uncovered information about behaviours that negatively impact on a patient's health. In response to this need, we developed a curriculum to teach Year 3 medical students BMI during their psychiatry clerkship. We believed that training students in BMI during the clinical years of medical school would heighten the relevance of their skill development by providing them with numerous *in vivo* patient experiences where the need for behaviour change counselling would emerge. We also believed that the consistency of BMI with our patient-centred communications curricula, the emerging BMI evidence base, and the initial positive findings in teaching medical students MI supported our curriculum development effort.

This article describes the development and evaluation of our BMI curriculum. Our primary aims were to determine the effect of our curriculum on medical students' communication skills when presented with behavioural problems during an interview, and its effect on their knowledge of and attitudes toward BMI. In addition, we wanted to assess the level of student satisfaction with the curriculum and overall training approach. We hypothesised that student participants would demonstrate increased use of BMI-consistent strategies (open-ended questions, reflections and reflective depth), decreased use of BMI-inconsistent strategies (closed questions and communication roadblocks), and increased knowledge and interest in BMI, confidence in using it, and commitment to the approach as part of their medical practice.

METHODS

Participants

A total of 45 Year 3 medical students at Yale University School of Medicine (YSM) volunteered to

participate in this pilot study during their psychiatry clerkship from January through June 2005. They all completed informed consent procedures that had been reviewed and approved by the YSM Human Investigation Committee.

Curriculum development

We developed the curriculum using an iterative process. During the students' psychiatry clerkship, we were provided with a single 2-hour block in which to teach students how to counsel patients in behavioural change. Other training requirements and full clinical rotation schedules limited our curriculum to this single brief training opportunity. The authors of this article convened to examine how to teach BMI to students in a manner consistent with their prior communication training. Two of the authors (SM and MP) have MI expertise, are members of the Motivational Interviewing Network of Trainers, and have taught MI to multidisciplinary groups throughout YSM. The 3 other authors (FH, RB and AF) develop and teach many of the YSM medical student core communication courses and seminars. To accommodate our curriculum's brevity, we organised the central elements of BMI around a mnemonic called CHANGE (described below) to promote rapid student acquisition of core material. We also employed non-doctor SPs/instructors who already were BMI-knowledgeable and could provide students with multiple practice experiences interspersed with immediate feedback and coaching, an effective approach for developing clinician MI proficiency.¹⁶ The student : instructor ratio for the curriculum was 2 : 1.

The CHANGE mnemonic captured essential components of BMI. In brief, the instructors taught students how to: *check* the patient's perspective about health and related behavioural problems using mostly open-ended questions; *hear* what the patient said with reflective listening skills (reflections, summaries); *avoid* MI-inconsistent behaviours such as unsolicited advice or direct confrontation; *note* the patient's behavioural change priorities using importance, confidence and/or readiness ruler strategies and determine the patient's change commitments; *give* feedback to the patient only when solicited or patient permission has been acquired first, and *end* the interview with a summary of the patient's plans for change and medical follow-up.

We employed 6 instructors (5 PhD YSM clinical faculty psychologists and postdoctoral fellows and 1 experienced Masters-level community counsellor) to

deliver the curriculum. Each instructor participated in 2 4-hour training sessions in which they learned how to teach CHANGE. Based on instructor feedback, we modified the curriculum to simplify the content and maximise the use of engaging teaching techniques (e.g. asking students to describe patient behavioural change dilemmas they had encountered in clinical settings, using personal experiences in practice role-plays). The curriculum's first hour involved a brief didactic about CHANGE, experiential role-play practice using open-ended questions and reflections, and the viewing of a videotape¹⁷ in which the importance and confidence ruler strategy was used during a medical visit. During the second hour, students rotated in pairs among the instructors, who now acted as SPs, a technique commonly used in medical education curricula.¹⁸ Each student practised and observed all CHANGE elements with 2 different SPs. They first practised the approach within a scenario involving cigarette, alcohol or illicit or prescription drug use. The second encounter involved common non-substance use behavioural change problems (e.g. diet and exercise, medication and preventive medical care non-adherence). Students conducted the interviews in 3 5-minute cycles. At the end of each cycle, the SP/instructor provided the student with immediate feedback and made suggestions about how to proceed with CHANGE. We piloted the CHANGE curriculum with a group of 10

Year 4 medical students who had completed psychiatry clerkships the previous year. These students recommended additional modifications to the curriculum. We incorporated these suggestions into the final version. Our CHANGE curriculum is summarised in Table 1. Detailed teaching materials and SP scripts are available at <http://info.med.yale.edu/clerkships/CHANGE/documents.html>.

Curriculum evaluation

We evaluated the curriculum using a pretest (immediately before training), post-test (immediately after training), and 4-week follow-up design for all participants. We asked students to rate both the degree to which the BMI trainers sufficiently covered the CHANGE components and the instructors' overall training skilfulness, using 7-point Likert scales (1 = not at all, 7 = extensively). We also asked them to rate their experience of the credibility of the SP enactments using a 10-point Likert scale (1 = not at all, 10 = extremely).

To measure how the students might respond to individuals presenting to them with various behaviour change dilemmas, we used the Helpful Response Questionnaire (HRQ).¹⁹ The HRQ presents 6 hypothetical patient statements and asks the respondent to write down 'what [he or she] would say next' in response to each statement without restriction. Each response is rated for the occurrence or absence of open-ended and closed questions, reflections and communication roadblocks (i.e. MI-inconsistent responses such as confrontation). Total scores are the summation per category across responses (maximum score = 6). In addition, each response is rated from 1 to 5 using a scoring algorithm where high scores are given to responses that are accurate in empathy and lack roadblocks and low scores indicate either a lack of reflective listening or that reflective quality is diminished by communication roadblocks. A reflective depth score is determined by summing the scores across responses (maximum score = 30).

To measure the students' BMI knowledge, we created and administered a 9-item, multiple-choice test designed to measure students' understanding of BMI principles and practices. Students received 1 point for each correct answer. We assessed students' interest in learning BMI, confidence in using it, and commitment to use BMI within future medical practice using student-rated 10-point Likert scales (1 = not at all, 10 = extremely) in each respective area. Students who completed all assessments received a \$20 gift certificate and were also entered

Table 1 Description of the CHANGE curriculum for Year 3 medical students, Yale University School of Medicine, 2005

Brief Motivational Interviewing (BMI) didactic

- 1 Introduction to the curriculum
- 2 Interactive discussion of the types of patient behaviour change problems students encounter on clinical rotations and the challenges they face in addressing these issues with their patients
- 3 Brief overview of BMI for behaviour change
- 4 Review DVD 1998 'Motivational Interviewing Professional Training' Programme E segment demonstrating BMI and derive characteristics of the MI spirit or style of interacting with the patient
- 5 Overview of the CHANGE model, coverage of each component, and specific role-play practice in open-ended questioning and reflective listening

CHANGE model practice

- 1 Standardised patient enactment of behaviour change vignette involving substance use
- 2 Standardised patient enactment of behaviour change vignette involving non-substance-related behavioural difficulties

One student conducts the interview using CHANGE components. One student observes the interaction while coding CHANGE elements

Instructor/SP pauses the interview after each of 3 5-minute cycles to provide the student with feedback and coaching

into a raffle in which 2 students received \$100 gift certificates.

We analysed the data using the linear mixed-effects modelling procedure available in SPSS (MIXED).²⁰ This analytic strategy allowed us to estimate missing datapoints from individual change trajectories based on all available data from a subject augmented by data from the whole sample using intercept and slope estimates instead of using more biased traditional approaches in which missing values are imputed or result in the exclusion of subjects from data analyses.²¹ In addition, the MIXED procedure accommodated the non-independence of observations for within-subjects comparisons that could occur from repeatedly gathering data from the same students within a 4-week time span.²² In the analyses we designated assessment timepoint as both a fixed and random effect. Scores on the HRQ and BMI knowledge and attitudinal variables were the fixed dependent variables. The restricted maximum likelihood method of estimation was used with specification of an unstructured variance-covariance matrix to generate the marginal means used to determine change in the dependent variables over the timepoints. Approximations of the *F* statistic were used to test the overall statistical significance of the change in fixed effects estimated marginal means over time. We compared pairwise timepoint estimated marginal means with a Bonferroni adjustment for multiple comparisons. All statistical tests with *P*-values ≤ 0.05 were considered significant.

RESULTS

Participant characteristics

A total of 45 students (100%) completed the pretest assessments. The students' demographic characteristics are as follows: gender (male = 47%, female = 53%), ethnicity (White = 64%, Asian-American = 22%, African-American = 7%, mixed race = 7%), mean age = 26.60 years (standard deviation [SD] = 2.83), and mean years of completed education 19.77 (SD = 2.32). A total of 20% of the students intended to specialise in internal medicine. The remaining students' specialisation interests were dispersed equally among all other areas of medicine (all below 9%), indicating a diverse range of medical specialisation interests among the participants. None of the students had previously attended MI training, read MI textbooks or manuals, or visited websites dedicated to the approach. Only 2 had read an article or attended a lecture about MI.

Measurement completion

At post-test, whereas all students completed the BMI knowledge survey, 1 student did not complete the scaled queries about personal attitudes and 11 students did not complete the HRQ. These students did not indicate their reasons for non-completion. A total of 22 students (49%) completed the 4-week follow-up. No gender, ethnic or age differences existed between the groups of assessment completers and those who dropped out of the pilot study.

Curriculum satisfaction

On average, students indicated that their instructors had covered each of the CHANGE components to a considerable degree (total mean = 6.25, SD = 1.02) with considerable to excellent skilfulness (mean = 6.52, SD = 1.02). They also rated the SP vignettes as credibly simulating patient behaviour change issues likely to emerge in medical practice settings (mean = 7.55, SD = 1.32).

HRQ scale reliability

We used interclass correlation coefficients (ICCs) using a random effects model to provide an estimate of scale reliability²² among 4 raters trained to score the HRQ for this study (reliability sample size = 40 non-study HRQs). The ICCs for all items were excellent (i.e. > 0.90) (Table 2).

Outcome analyses

Table 3 presents the results of the linear mixed-effects analyses with assessment timepoint as the independent variable and HRQ scores and BMI knowledge, interest, confidence and commitment as the respective dependent outcome variables. Overall, students significantly increased the frequency with which they responded with reflections ($F = 4.22$, $P \leq 0.05$) and increased the depth of their reflections ($F = 3.83$, $P \leq 0.05$). They did not alter the frequency

Table 2 Helpful Response Questionnaires (HRQ): item reliabilities based on intraclass correlation coefficients²²

Item	HRQ reliability
Open-ended questions	0.94
Reflections	0.96
Reflective depth	0.95
Closed questions	0.93
Communication roadblocks	0.94

Table 3 Effects of CHANGE curriculum on training outcomes over assessment timepoints: results of linear mixed-effects analyses ($n = 45$)²²

Training outcomes	Pretest	Post-test	Follow-up	d.f.*	F	Pairwise comparisons†
Helpful Response Questionnaire						
Open-ended questions	2.53 (0.24)	2.65 (0.28)	2.86 (0.36)	97	0.28	
Reflections	1.87 (0.31)	3.18 (0.35)	2.81 (0.45)	97	4.22‡	Post > pre‡
Reflection depth	15.31 (0.67)	17.97 (0.77)	17.48 (0.98)	97	3.83‡	Post > pre‡
Closed-ended questions	2.71 (0.24)	1.88 (0.28)	1.81 (0.35)	97	3.51‡	
Communication roadblocks	0.44 (0.11)	0.03 (0.13)	0.10 (0.17)	97	3.31‡	Post < pre‡
BMI knowledge						
BMI attitudes	5.04 (0.20)	7.02 (0.20)	6.86 (0.29)	109	27.65§	Post > pre§; FU > pre§
Interest	5.98 (0.42)	8.34 (0.42)	7.57 (0.61)	106	8.11¶	Post > pre§
Confidence	5.51 (0.37)	8.25 (0.37)	8.14 (0.53)	108	15.84§	Post > pre§; FU > pre§
Commitment	6.07 (0.34)	8.12 (0.35)	7.64 (0.49)	106	9.28§	Post > pre§; FU > pre§

Pretest, post-test and 4-week follow-up values represent estimated marginal means with standard error in parentheses

* Because of missing data, sample sizes for the different assessment timepoints ranged from $n = 45$ with 112 observations for MI knowledge to $n = 45$ with 100 observations for the Helpful Response Questionnaire outcomes, resulting in the different degrees of freedom

† Significance levels for pairwise comparisons include a Bonferroni adjustment; ‡ $P \leq 0.05$; § $P \leq 0.001$; ¶ $P \leq 0.01$

Post = post-test; pre = pretest; FU = follow-up

with which they incorporated open-ended questions into their responses. They also nearly eliminated low frequency communication roadblocks from their responses ($F = 3.31$, $P \leq 0.05$) and reduced their overall frequency of closed questioning ($F = 3.51$, $P \leq 0.05$). A pairwise pre/post comparison showing reduced use of closed questions approached statistical significance ($P = 0.07$). In general, the initial demonstrations of significant improvement in BMI-consistent responding declined slightly in follow-up, such that none of the pretest versus follow-up comparisons were significant at the 0.05 level, although changes from the post-test to 4-week follow-up were insignificant. In addition, students demonstrated significant increases in BMI knowledge ($F = 27.65$, $P < 0.001$), interest in learning more about BMI ($F = 8.11$, $P < 0.01$), confidence in using a BMI approach ($F = 15.84$, $P < 0.001$), and commitment to incorporating BMI into their medical practice in the future ($F = 9.28$, $P < 0.001$). With the exception of interest in BMI, wherein students only showed a trend toward continued significant heightened interest in learning more about the approach ($P = 0.10$), students largely maintained these positive attitudes toward BMI 4 weeks after completing the CHANGE curriculum. Gender, ethnicity and area of intended medical specialisation did not alter the pattern of results. (Analyses available from primary author SM.)

DISCUSSION

This pilot study tested the effectiveness of teaching Year 3 medical students BMI using a CHANGE

curriculum delivered by SPs/instructors within a single brief 2-hour training episode. Overall, students successfully increased their use of BMI-consistent skills, primarily by increasing the frequency and depth of reflecting what hypothetical individuals had said to them and by reducing the frequency in which they used closed questions and communication roadblocks in their responses. Students also showed increases in their knowledge about BMI, interest in the approach, confidence in their ability to use BMI, and commitment to incorporating BMI skills into their future medical practice. The findings suggest that Year 3 medical students can learn basic BMI skills and develop knowledge and positive attitudes toward the approach within a relatively short period of time when participating in a curriculum such as CHANGE. Furthermore, they were able to maintain some of this learning, given that their skill levels at the 4-week follow-up did not significantly differ from post-test levels. Students also continued to maintain BMI knowledge and attitudes supportive of the approach 4 weeks after participating in training and after exiting their psychiatry clerkship. These findings go beyond the positive results Brown and Oriel¹⁴ and Poirier *et al.*¹⁵ achieved in teaching medical students MI in that we documented changes in the students' use of specific interviewing skills and included follow-up assessment to provide an initial test of the curriculum's durability.

This pilot study has several limitations. Without a control group comparison, we cannot rule out the possibility that our generally positive findings occurred as a result of other factors (e.g. other

training experiences acquired during study participation). We also relied upon students' responses to hypothetical vignettes to assess their basic BMI skills instead of coding their actual attempts to use BMI with real patients at each assessment point, the gold standard in assessing trainee MI proficiency.^{23,24} Costs and complications posed by directly witnessing or acquiring recorded samples of student–patient encounters prohibited our use of this assessment method. Whereas past research in medical communication skills has relied upon the use of checklists and scales completed by SPs or observers to determine if students have demonstrated targeted skill sets and tasks,¹⁸ research on clinician proficiency in using MI has cast doubt on the wisdom of using coded interactions with SP actors for training research outcome assessment because the actors often do not respond like real patients (i.e. invariance in change-oriented and resistant statements) and, consequently, these transactions may obfuscate clinicians' true MI skills.²³ Nonetheless, this latter approach would have provided a closer approximation to how students might actually interact with patients using BMI. This study also did not link the students' use of BMI skills to changes in patient outcomes. Finally, the study had a brief follow-up period with sizeable attrition. Although we used statistical modelling procedures to estimate the missing data, the actual follow-up data for half the sample were unknown and could have altered our findings. Future research evaluating the effectiveness of behaviour change counselling skill development among medical students should include control comparison groups, longer follow-up assessment with improved retention rates, carefully coded samples of students' skills using well validated coding measures and real patient encounters, and should attempt to link BMI proficiency to specific patient behavioural change targets.²⁵

Despite these limitations, the number and consistency of significant positive findings in the predicted direction across the different outcomes is notable, particularly because training students and professionals in MI or BMI typically involves more extensive several-day workshop training than we provided in this pilot study, followed by multiple practice opportunities where students can receive skilful feedback and coaching to advance their proficiency.¹⁶ Although our findings do not provide firm evidence that the CHANGE curriculum resulted in alterations in how the students actually engaged patients in behaviour change counselling, they do suggest that a carefully developed brief, intensive and individualised curriculum in behaviour change counselling that

provides students with some opportunities for monitored practice, as in CHANGE, and which minimally intrudes upon students' other training and service demands may temporarily boost students' interviewing skills and heighten their investment in future skill development. Given that students may find the 10–14-hour training commitment adopted in prior medical student MI curricula excessive,²⁶ finding ways to teach students BMI efficiently and in a manner that is well integrated into the overall curriculum and clinical structure is imperative.

We developed CHANGE in response to our observation that our medical students need to learn skills for communicating effectively with patients about health-related behaviours. We are encouraged by the initial positive results of our pilot study. Future curricular efforts should focus on additional strategies to enhance and sustain students' use of BMI skills in their interactions with patients. These strategies might include offering students booster BMI practice sessions and bringing BMI training opportunities into the realm of different clerkship experiences to reinforce students' BMI skills and help them learn the approach appropriate to the context in which they practise medicine. This type of contextualised BMI training approach²⁷ could capitalise on the initial BMI skill-building students achieved with the CHANGE curriculum.

Contributors: all authors completed the curriculum design and plans for implementation and evaluation. SM, FH and AHF supported the active curriculum delivery and collected the data. SM analysed the curriculum evaluation data. All authors prepared the manuscript.

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REFERENCES

- 1 Liaison Committee for Medical Education. Functions and Structure of a Medical School, Standards for Accreditation of Medical Education Programs Leading to a Medical School Degree. Washington, DC: Association of American Medical Colleges, American Medical Association 2004. <http://www.lcme.org/functions2005oct.pdf>. [Accessed 5 January 2006.]
- 2 Association of American Medical Colleges. Report 3, Contemporary Issues in Medicine: Communication in Medicine, Medical School Objectives Project. Washington, DC: Association of American Medical Colleges 1999. <http://www.aamc.org/meded/msop/msop3.pdf>. [Accessed 5 January 2006.]
- 3 Makoul G, Shofield T. Communication teaching and assessment in medical education: an international consensus statement. Netherlands Institute of Primary Health Care. *Patient Educ Couns* 1999;**37**:191–5.
- 4 Smith RC. *Patient-centered Interviewing*, 2nd edn. Philadelphia, PA: Lippincott, Williams & Wilkins 2002.
- 5 Mead N, Bower P. Patient-centredness: a conceptual framework and review of the empirical literature. *Soc Sci Med* 2000;**51**:1087–110.
- 6 Glasgow RE, Davis CL, Funnell MM, Beck A. Implementing practical interventions to support chronic illness self-management in healthcare settings: lessons learned and recommendations. *Jt Comm J Qual Saf* 2003;**29**:563–74.
- 7 Miller WR, Rollnick S. *Motivational Interviewing: Preparing People for Change*, 2nd edn. New York: Guilford Press 2002.
- 8 Burke BL, Arkowitz H, Menchola M. The efficacy of motivational interviewing: a meta-analysis of controlled trials. *J Consult Clin Psychol* 2003;**71**:843–61.
- 9 Rollnick S, Mason P, Butler C. *Health Behaviour Change: A Guide for Practitioners*. London: Churchill Livingstone 1999.
- 10 Smith DE, Heckemeyer DM, Kratt PP, Mason DA. Motivational interviewing to improve adherence to a behavioural weight-control programme for older obese women with NIDDM: a pilot study. *Diabetes Care* 1997;**20**:52–4.
- 11 Harland J, White M, Drinkwater C *et al.* The Newcastle Exercise Project: a randomised controlled trial of methods to promote physical activity in primary care. *BMJ* 1999;**319**:828–31.
- 12 Scales R, Miller JH. Motivational techniques for improving compliance with an exercise programme: skills for primary care clinicians. *Curr Sports Med Rep* 2003;**2**:166–72.
- 13 Woollard J, Beilin L, Lord T *et al.* A controlled trial of nurse counselling on lifestyle change for hypertensives treated in general practice: preliminary results. *Clin Exp Pharmacol Physiol* 1995;**23**:466–8.
- 14 Brown RL, Oriel K. Teaching motivational interviewing to first-year students. *Acad Med* 1998;**73**:589–90.
- 15 Poirier MK, Clark MM, Cerhan JH *et al.* Teaching motivational interviewing to first-year medical students to improve counselling skills in health behaviour change. *Mayo Foundation Med Educ Res* 2004;**79**:327–31.
- 16 Miller WR, Yahne CE, Moyers TB *et al.* A randomised trial of methods to help clinicians learn motivational interviewing. *J Consult Clin Psychol* 2004;**72**:1052–62.
- 17 Miller WR, Rollnick S, Moyers TB. *Motivational Interviewing Professional Training (6-Tape Series) Segment E*. Albuquerque, NM: University of New Mexico 1998.
- 18 Kurtz S, Silverman J, Draper J. Simulated patients. In: *Teaching and Learning Communication Skills in Medicine*. Abington, UK: Radcliffe Medical Press 1998;62–8.
- 19 Miller WR, Hedrick KE, Orlofsky D. The Helpful Response Questionnaire: a procedure for measuring therapeutic empathy. *J Clin Psychol* 1991;**47**:444–8.
- 20 SPSS Inc. *spss 11.5 Base User's Guide*. Chicago, IL: SPSS Inc 2001.
- 21 Bryk KT, Raudenbush SW. *Hierarchical Linear Models: Applications and Data Analysis Methods*, 2nd edn. Newbury Park, CA: Sage Publications 2002.
- 22 Shrout PE, Fleiss JL. Intraclass correlations: uses in assessing rater reliability. *Psychol Bull* 1979;**86**:420–9.
- 23 Miller WR, Mount KA. A small study of training in motivational interviewing: does one workshop change clinician and client behaviour? *Behav Cogn Psychother* 2001;**29**:457–71.
- 24 Lane C, Huws-Thomas M, Hood K *et al.* Measuring adaptations of motivational interviewing: the development and validation of the behaviour change counselling index (BECCI). *Patient Educ Counsel* 2005;**56**:166–73.
- 25 Chen FM, Burstin H, Huntington J. The importance of clinical outcomes in medical education research. *Med Educ* 2005;**39**:350–1.
- 26 Koerber A, Crawford J, O'Connell KO. The effects of teaching dental students brief motivational interviewing for smoking cessation counselling: a pilot study. *J Dent Educ* 2003;**67**:439–47.
- 27 Rollnick S, Kinnerley P, Butler C. Context-bound communication skills training: development of a new method. *Med Educ* 2002;**36**:377–83.

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