

Article

Dental Hygienist Students' Learning About Motivational Interviewing

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Abstract: Objective: To investigate whether dental hygienist students through peer-learning can increase their ability to conduct motivational interviewing (MI) compared with students who follow the regular curriculum. The aim was also to get an insight into the process of learning of MI. Materials and Methods: Ten dental hygienist students were randomly selected to either the intervention group (IG) or the control group (CG). Students in the IG performed two MI sessions, which were discussed in a peer group and with a tutor. Thereafter the students performed the third MI sessions, which was evaluated by “Motivational Interviewing Treatment Integrity Code, Version 3.1”. The CG consisted of five students who followed the regular curriculum in the education and they conducted one MI session. A questionnaire was used to study how students reflected before and after these MI sessions. The analysis was performed by using descriptive statistics and for the comparison between groups the Mann-Whitney test was used. Results: The students in the IG used significantly more, simple and complex reflections ($p < 0.05$) compared to the CG. The IG gave also significantly less information during the counseling, and thereby asked more open-ended questions than the CG ($p < 0.05$). Both groups planned their MI sessions carefully by preparing questions before they met the patients. Conclusion: Dental hygienist students in the present study increased their skills in motivational interviewing by peer-learning from other students and from a tutor, compared to a control group.

Keywords: Motivational interviewing; training; education; dentistry; practical skills

1. Introduction

For modern health practitioners an important aspect of patient treatment is counseling sessions with the patients aiming to give advice and motivate him or her towards healthy behavior. Counseling sessions require development of special communication and counseling skills. In order to achieve this, different methods have been proposed, e.g., cognitive behavioral therapy (CB) [1], and motivational interviewing (MI) [2]. During recent years, MI has been advocated as a useful way to reach behavioral changes, also regarding oral health issues [3,4]. MI is an evidence-based interview method that aims to support patients to change a behavior by stimulating to positive changes and strengthen the person's own motivation [5]. This also means that teaching within this area is essential and that dental and dental hygienists students need to be prepared to implement this knowledge in their daily work routines, which, furthermore, constitutes a new challenge in the education, where the goal is to give communication and counseling training in the clinical setting.

1.1. Learning

One of the key targets of the academic community is to help students to produce quality learning outcomes, which is dependent upon complex network of factors that influence the teaching-learning environment, including teacher's approaches to teaching, students' approaches to learning, motivation, self-regulation, and conceptions of learning and teaching [6,7]. It is an interplay between learning and teaching that produces learning outcomes, which means that activities should not be studied independently, but in a context, where also the students have an own responsibility to their learning processes, which has an effect on the learning outcome [8]. This can be related to a constructivistic approach [9], which means that the students construct their own knowledge, by elaborating and processing information and experiences, relating to prior knowledge, and construct their own understanding. When a new situation occurs, the individual must change their behavior or thinking, an adaptation process, which leads to the creation of further new knowledge [10]. Knowledge can be likened to a process which is self-regulated, and where, also, the interaction with other students is important, with emphasis on social interaction and by listening to other student's interpretations of the same topic [11].

Reflection is a cognitive approach for intellectual and affective activities in which the students engage to explore their experience in order to gain new understanding and appreciation [12]. Reflection is, therefore, a conscious and deliberate process that focuses on understanding events and processes to bring about self-improvement and to move from the status of novice to that of an expert [13]. Reflection is an ongoing skill, and training in reflective practice can be significantly enhanced with the facilitation of providing guidance and modeling of reflective behaviors, [14]. Biggs [15] stated that new knowledge that is to be transformed into a practical context is enhanced by implementing time for reflection.

Feedback is a pedagogic activity and central to supporting cognitive technical and professional development [16]. Feedback is a process whereby learners obtain information about their work in order

to appreciate the similarities and differences between the appropriate standards for any given work, and the qualities of the work itself, in order to generate improved work [17]. All feedback is ideally discussed face-to-face in a context that is supported by a trained facilitator. Feedback could both be teacher-driven and from the students, called peer-learning, which means that all participants in a group have the same level of knowledge and that they through reflections discuss a given task and thereby use each other's experiences [15].

1.2. Motivational Interviewing

MI is a direct and patient centered counseling style that helps people resolve their ambivalence and move towards a healthy change [18]. MI represents a way to interact with people and contains a genuine interest to be able to understand other people and their manner [19]. The therapist sees himself as an equal interlocutor to the patient. Furthermore, the purpose of MI is to find the inner motivation within the patient and reveal it, rather than creating the motivation for the patient.

Motivational interviewing includes four basic processes; engaging, focusing, developing, and planning, in order to create an atmosphere favorable to change and where compassion is one of the key elements [5]. It is important that the counselor express empathy through reflective listening and by demonstrating non-judgmental understanding of the patient's situation and perspective. The counselor should also help the patients to explore gaps between his/her current behavior and change he/she would like to obtain, e.g., develop discrepancy. By the use of open-ended questions and simple and complex reflections the patient's statements are confirmed. Simple reflections means the precise rendering of the patients statements in his own words, while complex reflections reveal other dimensions, such as thoughts and feelings [20]. MI is therefore guiding and focused on changing behaviors that favors, e.g., good oral health. It is important that the therapist makes the discrepancy visible, between where the patient stands today and where he wants to be in the future. Resistance to behavioral change within the patient can occur from different reasons. In that situation the therapist should "roll against resistance", by reflecting over the statements, accepting the patients autonomy and not argue to develop a change that can give an opposite effect [5]. Instead the therapist should explore more about the patient's ambivalence regarding change. Another important element in motivation to develop a change in behavior is self-efficacy. The counselor aims to enhance the patient's confidence and his or her capability to overcome the obstacles.

MI counseling has been used for the treatment of oral diseases, such as inflammation/periodontitis [21], caries and daily oral hygiene in children [22], and for tobacco cessation [2], all with a positive outcome.

1.3. Education to Conduct MI

The dental hygienist (DH) profession promotes oral health among individuals and includes prevention and lifestyle changes, as well as diagnosing and treating oral diseases [23]. The Dental Hygiene Program curriculum at the Karolinska Institutet (KI) [23] includes teaching in communication, patient education, and counseling skills through all semesters. The students are introduced on the theory of MI, through lectures, role-plays, and films that show MI in dental situations to support patients to change behavior and thereby to achieve better oral health. The students conduct MI in role-playing,

which is video recorded and then they reflect over what was good in the conversation and what could have been said in another way. During this session the students get feedback from the student group and the supervisor. In addition, the students also conduct MI in the treatment of patients in the clinical practice. As the implementation of MI in the treatment of patients with gingivitis and periodontitis has shown to be successful in terms of achieving better oral hygiene, it is important to evaluate if higher education in conducting MI is successful.

The aim of the present study was to investigate whether dental hygienist students through peer-learning can increase their ability to conduct motivational interviewing compared with students who follow the regular curriculum. In addition, the aim was also to get an insight into the process of learning of MI.

2. Methods

2.1. Participants

Ten randomly selected students (women aged 20–35 years) in the second year of the dental hygienist education at the Dental Hygiene program at KI were invited to participate in the study. The students were given a description of the study, including their right to refuse participation and to withdraw from the study at any time for any reason. This study was approved, 758-31/3, by the Ethics committee in Stockholm. To ensure anonymity, there was an understanding between students and tutors that, the discussions during the reflection sessions only should be discussed at that time.

The patients included in the project were all suffering from chronic periodontitis, with bleeding probing (BOP) score more than 50% and at least three teeth with interproximal pockets depth (PD) more than 5 mm and who had not yet received treatment or oral hygiene instructions. No other inclusion criteria were involved. All patients received information about the tape recording being anonymous, and that after the investigation, all materials would be discarded.

The MI-intervention lasted for, in average, twenty minutes and was performed in the clinic at the Department of Dental Medicine. The interview was initiated with an open question regarding how the patient perceived his /her current oral health status. Specific strategies regarding behavioral changes in relation to oral health and periodontal treatment were initiated and reinforced. The questions were designed to follow the principals of MI (clinician empathy, discrepancy between patients' goals, and values and their current behavior). Patients who expressed low motivation and readiness for a change were encouraged to explore their ambivalence. Oral hygiene information and instruction were given to the patient during MI. Successful health related behavioral changes were emphasized in order to enhance self-efficacy.

The students were randomly selected to either intervention (IG) or control group (CG). The five students in the intervention group completed two training sessions of MI with two patients each. These MI sessions were audio recorded and then transcribed. On two occasions (each three-hours setting), about a month apart, the MI was evaluated by the student group with "peer learning", which means that the students provided feedback and gave constructive suggestions on the interviews regarding which statements that was compatible with the MI method. The tutor was also present and strengthened the students' feedbacks. Coding template MITI 3.1 [24] was used as a support to measure how well MI skills were conducted. Then a third MI (three-hours setting), in the IG was performed and

coded by the author according to the MITI 3.1. In the intervention group there was one drop-out, because one patient refused to audio tape the interview.

The CG consisted of five students that had followed the regular curriculum in communication and counseling skills in the program. The students conducted one MI counseling with a patient at the department of Dental Medicine. The MI interview was audio recorded and then transcribed and coded according to the MITI 3.1 by the author. There was one drop-out in the control group because one recording of the conversation could not be heard. The third MI interview in the IG was compared to the MI interview conducted by the CG.

2.2. Coding Manual MITI 3.1

The instrument, “Motivational Interviewing Treatment Integrity Code, Version 3.1” (MITI 3.1) was used to measure students’ use of MI techniques during a patient education session [24]. The MITI scoring tool is conducted to assess empathy, MI spirit, MI adherence, MI non-adherent, types of question (open or closed), and number of reflections. The coder is required only to count, not to judge the quality or overall adequacy of the session. An overall estimate of empathy, MI spirit, and governance, estimated according to a five-point scale was made. This tool MITI 3.1 has a good reliability, according to Forsberg *et al.* [25] (2007), who measured the coding after two occasions and reported that the mean intra-class correlation (ICC) was 0.81 and the mean Cronbach's alpha was 0.96. To ensure the reliability of the coding, a comparison between the author and MicLab's (at the Department of Clinical neuroscience at KI) coding MITI 3.1 was performed with four of the students MI sessions (two from intervention group, and two from the control group). MicLab has professionals who continuously perform the coding of MI. The reliability of the coding was good between the author and the MicLab.

2.3. Questionnaire

A questionnaire was used to study how the dental students reflected before and after their MI intervention. The questions were of an open nature meaning that they were answered with free text, i.e., not with any given answer. These form of questions are used in educational settings where self-reflection is emphasized. The questions addressed several aspects both, prior to the MI with patients, e.g., how did you prepare your MI, describe strengths and weaknesses of yourself or the patient and after the MI, e.g., was it what you expected, did something happen during the talk that you were not prepared for, what was difficult, and, describe your feeling afterwards.

The analysis of the questionnaire is evaluated by the students’ reflections and thoughts of the learning activity, which are based on key quotes from the students. The aim was to get an insight into the process of learning of MI and to develop strategies to enhance learning both theoretically and in a clinical situation.

2.4. Data Analysis

The data processing of the MI sessions, coding manual MITI 3.1 variables have been used in Microsoft Excel 2010. The data from the IG and the CG are reported in a number of estimates at an individual-

and at a group level. The median value is presented on a consolidated basis from each group. In the statistical analysis, each variable from MITI 3.1 was merged, i.e., each group represents the students' overall estimates.

The IBM statistical program SPSS 21 software (Chicago, IL, USA), and Mann -Whitney test was used to compare the total number of statements between the two groups (Table 3). A p-value of 0.05 was set as the level of significance.

3. Results

Skills in motivational interviewing were coded according to the coding manual MITI 3.1, and is presented for each student both in the IG and in the CG (Tables 1 and 2). The five variables according to MITI 3.1, to show empathy and to be collaborative, to have MI spirit, (which include respect of patient's autonomy), and to keep focused on the communication and to have target behavior (control), and to be focused, are presented in Table 1 and 2. The five variables were encoded on a scale from 1 to 5.

The results showed that the students in the IG asked more open-ended questions and used more simple and complex reflections during their MI sessions, compared to the CG, who informed patients in a more traditional way. Regarding the overall estimates of the five variables there were no significant differences between the groups.

Table 1. Coding of the number of comments from “behavioral frequency” and observations from the “overall estimating” in motivational interviewing (MI) from the students in the intervention group, according to MITI 3.1.

	Student 1	Student 2	Student 3	Student 4	Total no
Behavioral frequency	No.	No.	No.	No.	
Gives information	8	3	4	4	19
MI Adherent	2	0	5	3	10
MI Non-adherent	0	2	0	1	3
Closed questions	4	10	1	3	18
Open questions	6	3	12	9	30
Total question					48
Simple Reflections	4	4	5	2	15
Complex Reflections	5	1	3	2	11
Total Reflection					26
Overall estimating (Scale 1–5)					
Empathy— <i>effort to understand</i>	4	3	4	3	14
MI spirit— <i>to elicit</i>	4	2	5	3	14
MI spirit— <i>to be collaborative</i>	4	2	5	3	14
MI spirit— <i>autonomy supportive</i>	4	3	4	3	14
Steering— <i>to have focus</i>	5	5	5	4	19

No. = Number

In Table 3, the total number of times each variable have been used in both the IG and CG is presented. Students in the IG had significantly higher tendency to use simple and complex reflections ($p < 0.05$) and gave the patients less traditional information ($p < 0.05$) in comparison with the CG

(Table 3). Regarding the frequency of use of the MI variables, empathy; MI spirit, and to be focused, the IG showed higher median values than the CG, however no significant differences were found. It seemed that the students were strengthened by having prepared themselves by reading the literature and constructing questions to the patients (no data shown).

Table 2. Coding of the number of comments from “behavioral frequency” and observations from the “overall estimating” in MI from the students in the control group, according to MITI 3.1.

	Student 1	Student 2	Student 3	Student 4	Total no
Behavioral frequency	No.	No.	No.	No.	
Gives information	11	8	6	10	35
MI Adherent	3	7	4	4	18
MI Non-adherent	10	1	0	3	14
Closed questions	13	7	4	4	28
Open questions	5	5	4	2	16
Total questions					44
Simple Reflections	2	2	1	2	7
Complex Reflections	1	0	0	0	1
Total Reflection					8
Overall estimating (Scale 1–5)					
Empathy— <i>effort to understand</i>	2	3	1	1	7
MI spirit— <i>to elicit</i>	2	3	1	3	9
MI spirit— <i>to be collaborative</i>	2	4	1	3	10
MI spirit— <i>autonomy supportive</i>	2	4	2	3	11
Steering— <i>to have focus</i>	5	5	3	5	18

No = Number

Table 3. Overall data regarding the behavioral frequency from the intervention group and the control group, according to MITI 3.1, by using Mann-Whitney test.

	Intervention group	Control group	<i>p</i> value
Behavioral frequency			
Gives information	19	35	0.05
MI Adherent	10	18	ns
MI Non-adherent	3	14	ns
Closed questions	18	28	ns
Open questions	30	16	ns
Simple Reflections	15	7	0.05
Complex Reflections	11	1	0.05

ns = non-significant

3.1. Results from the Questionnaire

All students prepared the MI, through reading the literature about the MI method. This strengthened them and they felt less nervous. In addition, the students also planned questions on a paper. Another issue that the students highlighted was that they were not aware of how the patients should react on the conversation or if the patients' behavior would be expressed, such as silence or resistance to the questions. Moreover, the students also had thoughts on whether they had sufficient structure and flow in the conversation.

"I have prepared myself and read about MI"

"I wrote down questions that I started the conversation with"

"One weakness I have, I get nervous but I have prepared myself by writing down key words and read the book about MI"

"I was worried about how the patient would react to the topic of the conversation"

The students experienced their MI session as they had expected, meaning it was difficult. Students felt that it was difficult to manage patient's behavior, and it was difficult for them to answer the questions, which led to silence of the patient. This meant that the students could not keep the structure of the conversation and read the questions, which they had prepared, and, thus, the flow in the conversation did not become as good as expected. One student (from the IG group) could handle the patients' resistance to change, by using complex reflections according to MI and this was a positive feeling.

"During the conversation it was difficult to express myself and, the questions became very long and complex"

"It was difficult to keep a flow in the conversation"

"It's hard to think of what to talk about while I had to concentrate on how to say"

"I was not ready for the hard resistance of the patient but with the help of complex reflections according to MI, the patient defensive position was reduced"

The students in the IG emphasized the value of having peer-review with both other students and with a tutor, which increased their ability to reflect on their own abilities. They also highlighted that it was an advantage to discuss other student's experience of conducting MI.

4. Discussion

The results showed that the intervention group had acquired more skills in using simple and complex reflections in the MI counseling techniques with the patient compared to the control group. It was also revealed that the CG showed a tendency to give more information rather than asking open-ended questions compared to the IG. Students prepared their MI to the patient by reading the literature and preparing questions, to feel more confident in the conversation. The students found it difficult to have a flow in the conversation, and in the same time be able to manage the patient's statements. This is in line with Croffoot *et al.* [26], who found that students who got feedback/coaching improved their skills

in MI. They also concluded that MI is a useful tool in the development of change in patients' behavior and to implement MI skills in the educational curriculum had also a positive impact upon patient education. Other studies [20,27] also confirm that when the MI methodology is included in the curriculum and the method is practiced during training, students enhance their skills and they become more able to discuss lifestyle changes with patients, which supports the value of implementing this method in the dental hygienist and dental programs [28].

Another finding was that the CG gave the patients more information and in the same way they asked for permission to provide information to the patient, which is consistent with MI. One explanation for this could be that they were aware of the MI methodology [29], which means that you ask the patients permission to give information. This indicated that the CG used more of the traditional pattern of dental care to advice patients about their self-care, in contrast to the IG who gave less information and instead explored the patient's opinions by using open-ended questions and reflections of their own statements.

A systematic review by Rubak *et al.* [30] concluded that the MI-method as an intervention, often turned out to have a good effect in achieving behavioral change in patients with oral problems. In another study patients expressed greater satisfaction with the dental visits compared to a control group who received conventional advice [31]. MI has also been conducted in periodontitis patients [32], but they found no reduction of gingival inflammation among the patients who had received MI compared to the patients who had received conventional advice. The authors commented this by the fact that this was a single pre-treatment MI-session and that the patients who were referred to a specialist clinic for periodontal treatment might already have passed the stage of ambivalence and consequently, already were motivated to adhere to treatment. The National guidelines in Sweden for adult dental care [33] recommend using structured interviews, e.g., the MI method, to achieve better outcomes, i.e., a positive change of patients' behavior. In the present study we have not measured the possible effects of conducting MI, in terms of achieving a behavioral change in patients.

The present study showed that recurrent feedback from students and teachers seemed to increase the students' knowledge and skills to perform MI. This is in line with White and Pollex [20] and Buring *et al.* [27], who confirm that when the MI methodology was included in the curriculum and the method was practiced during training, it enhanced students' skills and deepened their ability to discuss lifestyle changes with patients.

A peer-group, which had the intention to act as a facilitator for learning, increased the student's confidence in conducting MI [34,35], which also is in line with our project, where learning takes place through interaction with others. Feedback and the experience of managing are critical for the students' ability to understand a wider context [36], which also was addressed in the present study.

A key issue is the use of reflection [37]. In relation to a learning situation, the students are encouraged to make choices and decisions, appraise, judge, and plan, which can be related to the present study. Teachers with their teaching practices represent a key factor that influences students learning environments and are supposed to challenge students' critical awareness in their interaction with the people involved, the subject matter and the actual learning environment. Promoting active work and reflection related to the reality-based situation, as in the present study, enhances the learning process [36]. Furthermore, pedagogical training has a positive effect on teachers' learning-centered approach to teaching [38].

In the present study, the students increased their self-esteem by reading the literature and creating their own structure to implement MI, which emphasizes the importance of the constructive learning [10].

This is also in line with Freeman and Ismail [39] who highlight the significance of self-reflection and self-evaluation, which increases the chance that an individual will take actions to attain performance skills. Since, the primary goal of the process of MI is to assist patients to make their own decisions and set their preferred goals, according to Freeman and Ismail [39] it is important to investigate whether training in MI results in better ability to perform MI.

One of the limitations of the present study is the small number of students included, which might affect the results. On the other hand, this a pilot study and all participants/students represent a very homogenous group. One of the reasons for conducting the present research project was to justify the implementation of MI in the curriculum of the dental hygienist education. The students in the present study were randomized to each group, which is an advantage for the study's credibility. To increase reliability, four of the student's transcribed conversations, which were coded according to Coding Manual MITI 3.1 [24], were sent to the Mic Lab for calibration, and the reliability was good. Based on the results of the encoding (MITI 3.1) of the MI skills, the students' counseling sessions/MI were not fully justified MI's compared to reference values from clinical studies. This showed the importance of practical training in conducting motivational interviewing.

Students' approaches to learning MI skills have been little explored in academic context and more research in this academic environment is needed, together with further investigation in this area to distinguish between pedagogical methods for communication with the patient. These studies should include a greater number of students and at the same time one should examine how students learn these specific skills that are required in MI and to improve their confidence in behavior change related communications with patients. In addition, more research is needed to evaluate the patient's behavior change by the use of MI methodology.

4.1. Conclusions

Dental hygienist students in the present study increased their skills in motivational interviewing by peer-learning from other students and from a tutor; compared to a control group.

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Interest of conflicts

The authors declare no conflict of interest.

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