

Delivery of Post-Dental Extraction Care Instructions with the Aid of a Novel Educational Kit: The UiTM Dental Students' Perspective

Nurkhalidah Sabrina Ikmalhisam¹, Nur Syakirah Abdul Aziz², Michelle Clare Mah³, Tengku Intan Baizura Tengku Jamaluddin⁴, Hazmyr Abdul Wahab⁵, Mohd Shawal Firdaus Mohammad⁶, Tan Su Keng^{7*}

^{1,2}Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh Campus, Jalan Hospital, 47000 Sungai Buloh, Selangor, Malaysia

^{3,4,5,6,7}Centre for Oral & Maxillofacial Surgery Studies, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh Campus, Jalan Hospital, 47000 Sungai Buloh, Selangor, Malaysia

*Corresponding author: ⁷tansukeng@uitm.edu.my

ARTICLE HISTORY

ABSTRACT

Received
31 May 2021

Accepted
14 July 2021

Available online
23 August 2021

The objective of this study is to assess Universiti Teknologi MARA (UiTM) dental students' perspective on a novel patient educational kit in helping them to deliver post-dental extraction care instructions. All undergraduate clinical year dental students of the Faculty of Dentistry, UiTM were recruited for this cross-sectional study. 87.8% of these students have volunteered to participate in this study. An 8-minutes introductory video of the Post-Dental Extraction Care kit (PDEC-kit) was played when simultaneously showcasing the tools in the PDEC-kit to the participants. The participants then answered a set of validated self-administered questionnaires online on their perception and suggestions for improvement of the PDEC-kit, which comprises of 20 items that are rated by a 7-point Likert scale along with 7 open-ended questions. A total of 216 students participated voluntarily in this study. A vast majority of participants agreed that the PDEC-kit is useful (99.1%), easy to use (98.7%), and can improve patient's understanding regarding post-dental extraction care instructions (99.1%). The information provided in the kit was also found to be appropriate for the patients (97.2%). Interestingly, students who had clinical experience in performing dental extractions have rated significantly higher scores for half of the questions ($p < 0.05$). All but two participants (99.1%) thought that PDEC-kit would assist them in providing better post-dental extraction instructions to patients compared to providing verbal instructions only. Most of the participants (93.5%) also agreed that the kit can improve communication or rapport between patients and them. UiTM dental students agreed that PDEC-kit is beneficial and can help them in delivering more effective post-dental extraction care instructions to their patients.

Keywords: patient education; post-extraction care; tooth extraction; dental students; dental education

1. INTRODUCTION

Dental extraction, also known as exodontia, is one of the most common dental procedures. Pain, swelling, delayed healing, prolonged bleeding, infection, oro-antral communication, nerve injury, sinus perforation, trismus, and alveolar osteitis can occur post-operatively.[1] Nonetheless, most of the complications after dental extractions can be reduced with proper clinical procedures complemented with precise post-operative instructions. Researchers have emphasised continuously the need and importance of patient's education and their compliance after tooth extraction to reduce

morbidity and improve patient's quality of life [2]. Proper explanations to the patients regarding post-operative expectations, care instructions, and potential complications can reduce their stress while improving satisfaction with the treatment received; thus, it minimises the lawsuits [3, 4].

The patients could forget up to 40%-80% of the information given by the professional due to the usage of difficult medical terminologies, ineffective mode of information delivery, and patient factors such as low education level [5, 6]. Furthermore, the effectiveness of post-operative instruction delivery may be affected by the perioperative feeling of anxiety, fear, and exhaustion of the patients. Besides, dentists may have missed some important points when delivering the instructions to the patients too. The patient's understanding of post-extraction instructions can be increased by effective communication between the patient and the dentist [7]. Their understanding and adherence to post-dental extraction care instructions will affect the recovery period after the procedure [8]. An exponentially high incidence of post-operative dry sockets (57.1%) has been reported in non-compliance patients [9]. Therefore, a practical post-operative care instructions delivery system or tool is needed to enhance the effectiveness of conventional verbal post-operative instruction.

The postoperative care instructions presentation method can affect the patient's understanding.[8] Generally, post-operative care instructions can be delivered through verbal, media, or written methods. Some researchers [4, 10, 11] have reported that verbal instructions alone are ineffective. A study has reported that patients remembered only 14% of the verbally given information in comparison to 80% when combining with pictograms [12]. A combination of different post-dental extraction care information delivery platforms can enhance its efficiency and reduce post-operative complications. A randomised clinical trial has reported a significant difference in pain intensity and postoperative satisfaction between verbal, written, and verbal plus written post-dental extraction care instruction groups favouring the latter group [13]. It has been reported that patients who were given detailed post-extraction information experienced less post-operative pain and expressed more satisfaction compared with those who have received minimal information [3]. Researchers have also reported that enhancing verbal post-operative instructions with written information could reduce a patient's pain experience and increase satisfaction after the dental extractions [14]. A study showed that the use of the mobile application to provide educational material and instructions to the patients was feasible and beneficial by improving patient's surgical experience and satisfaction [15]. With the advancement of new technologies in the current digital era, post-extraction instructions can be delivered more creatively and interestingly to the patient.

Centre of Studies for Oral Maxillofacial Surgery, Universiti Teknologi MARA (UiTM) has introduced a novel patient educational kit known as Post-Dental Extraction Care kit (PDEC-kit), which include items to be brought home and in-office practice. The kit includes a 2-minute informative educational video, a smartphone application available in both IOS and android formats, a multi-lingual pamphlet with detailed instructions that can be brought home by the patients, a set of dos and don'ts flashcards, and a teeth model to practice manual socket compression in the dental clinic for effective bleeding control [16]. This information is also easily accessible anywhere and everywhere by the provided quick response (QR) code, which also includes the details of emergency contact numbers for patients to manage any complications [16]. Additionally, the PDEC-kit has further expanded its applicability to patients with special needs such as blind and deaf-blind by providing a Braille pamphlet detailing instructions after dental extraction [16].

The PDEC-kit can be used as a tool to enhance post-extraction instruction delivery to the patients by dental students and general dental practitioners. The short and informative educational video

that can be played on tablets or mobile devices in the clinic to enhance patients' understanding of post-extraction instruction, especially during the stressful post-operative period. The dos and don't's of post-extraction care are presented in the flashcards with simple and clear pictures at the chairside to the patients that can aid the patients to recall the post-extraction instructions later. Meanwhile, the teeth model can be used to show patients the proper way of compression on the extraction socket for bleeding control. Written instructions in the pamphlet can be used as a guide after the patient leaves the clinic. Furthermore, this pamphlet can also be accessed online anywhere and anytime through a QR code. Additionally, patients can download the smartphone application on their mobile device, which include concise information on wound care, potential complications, and their management. On the other hand, PDEC-kit can also be used as an educational tool for dental students and dentists to enhance their rapport with patients in their clinical practice [16].

The post-dental extraction instructions given by dental students and practitioners are often not systematic nor standardised, resulting in some important aftercare information missing during the verbal delivery. As a result, patients are unable to practice proper wound care and potentially elicit some avoidable post-operative complications such as prolonged bleeding and delayed socket healing unnecessarily. A simple yet concise and precise patient education kit may be able to aid the dental students and dentists to provide effective post-dental extraction care to the patients. Hence, this study aims to assess UiTM dental students' perspective on delivering post-extraction care instruction with the aid of a novel educational kit.

2. MATERIAL AND METHODS

This study applies a cross-sectional survey with a validated questionnaire to assess UiTM dental student's perception of the PDEC-kit. The ethical approval for this study was granted by the Research Ethics Committee, Universiti Teknologi MARA (REC/02/2020-UG/MR/70).

2.1 Questionnaire validation

The questionnaire used in this study was developed by the authors. It consists of 20 items assessed with 7-point Likert scales ('strongly disagree'= 1, 'disagree'= 2, 'slightly disagree'= 3, 'neither agree nor disagree'= 4, 'slightly agree'= 5, 'agree'= 6, and 'strongly agree'= 7) and 7 open-ended questions. The face validity of the questionnaire was checked by 12 dental specialists. A pilot study was conducted among 50 fresh graduated dental students to assess the content validity and reliability of the questionnaire. A final questionnaire was then developed.

2.2 Survey study

The convenience sampling method was applied in this study. All clinical year dental students (years 3, 4 and 5) of the Faculty of Dentistry, UiTM were recruited in this study. After getting the consent from all volunteered participants, a short introductory video of 8-minute duration providing the information of the PDEC-kit (Figure 1) was shown to them through the online Google Meet platform. The video introduces each tool in PDEC-kit and demonstrates its usage. The video also includes the background and objectives of the PDEC-kit. Additionally, the post-operative instruction video of the PDEC-kit also was played to the participants.



Figure 1: Patient educational kit: Post-Dental Extraction Care kit (PDEC-kit)

Subsequently, all participants were asked to answer a set of an online self-administered survey in Google Form. The survey consists of four parts including demographic profile, questions on their perception, and suggestions to improve the PDEC-kit. Additional questions about the market survey also are included to evaluate if they will purchase the kit if it is available in the market.

The results of the survey were collected and analysed by with SPSS Statistics for Windows, Version 27.0. Armonk, NY: IBM. The demographic profile of the participants was recorded using descriptive statistics. An Independent T-test was used to compare the mean score between genders and students with and without experience of performing dental extraction. One-way ANOVA was used to analyse the mean score between different clinical years.

3. RESULTS

3.1 Demographic profile

246 clinical year dental students have been recruited in this study. A total of 216 students have volunteered to participate in this study, which corresponds to a satisfactory response rate of 87.8%. 183 of them are female (84.7%), while 33 of them are male (15.3%). All participants have submitted their responses immediately. This female-to-male ratio is conforming to the higher female student's ratio in this field of study. The majority of the participants are Malay, while five respondents are Bumiputra from East Malaysia. Furthermore, 49.1% of the participants have the clinical experience of performing dental extractions.

3.2 Dental students' perception of PDEC-kit

Overall, the dental students had a very positive perception of the PDEC-kit (Table 1). 13 out of 14 positive statements are agreed by more than 90% of the respondents.

During the conduct of this survey study, many clinical year students are still without clinical experience of dental extractions because of the prolonged suspension of undergraduate clinical activities by the faculty due to the COVID-19 pandemic. Therefore, the perception of dental students with and without clinical experience of dental extractions have been compared (Table 2).

Table 1: Dental students' perception of PDEC-kit

	Agree*		Neutral*		Disagree*		Mean (SD)
	n	%	n	%	n	%	
1. The tools in the PDEC-kit are easy to use.	213	98.7	3	1.4	-	-	6.35 (0.65)
2. The tools in the PDEC-kit are useful in providing post-dental extraction instructions	214	99.1	1	0.5	1	0.5	6.46 (0.65)
3. The PDEC-kit will assist me in providing better post-dental extraction instructions to patients compared to providing verbal instructions only.	214	99.1	1	0.5	1	0.5	6.46 (0.69)
4. Using the PDEC-kit will increase my confidence when providing post-dental extraction instructions to patients.	211	97.7	4	1.9	1	0.5	6.40 (0.74)
5. The tools provided in the PDEC-kit is not sufficient for educating patients on post-dental extraction care.	32	14.8	27	12.5	157	66.7	2.92 (1.67)
6. I will not miss out on any post-dental extraction instructions with the aid of the PDEC-kit.	199	92.2	13	6.0	4	1.9	6.01 (0.93)
7. In my opinion, the visual and audio tools in the PDEC-kit can improve patients' understanding regarding the post-dental extraction instructions	214	99.1	1	0.5	1	0.5	6.50 (0.63)
8. The duration of the educational video in the kit is too long.	78	36.1	59	27.3	79	36.6	3.86 (1.46)
9. The information provided in the PDEC-kit is appropriate for patients who underwent dental extraction	210	97.2	5	2.3	1	0.5	6.32 (0.74)
10. As a dental student, the PDEC-kit will not improve my understanding of post-dental extraction care.	11	5.1	13	6.0	192	88.8	2.05 (1.23)
11. The PDEC-kit will provide significant benefits to my clinical practice.	211	97.7	3	1.4	2	1.0	6.31 (0.83)
12. The usage of the PDEC-kit is too time-consuming.	22	10.2	57	26.4	137	63.4	2.93 (1.25)
13. The PDEC-kit is a concise and precise patient education tool.	207	95.8	8	3.7	1	0.5	6.12 (0.77)
14. Using PDEC-kit has more disadvantages than advantages.	12	5.7	8	3.7	196	90.7	2.04 (1.02)
15. The PDEC-kit will improve communication or rapport between dental students/practitioners and patients.	202	93.5	13	6.0	1	0.5	6.07 (0.86)
16. The length of the educational video in the PDEC-kit is appropriate.	150	69.4	48	22.2	18	8.3	5.21 (1.27)
17. As a dental student, the tooth model helps me understand the application of gauze pressure better.	212	98.1	3	1.4	2	0.5	6.21 (0.76)
18. The tooth model will aid in guiding patients to apply gauze pressure correctly.	211	97.7	5	2.3	-	-	6.31 (0.71)
19. The flashcards are not beneficial in improving patients' post-dental extraction care.	9	4.3	22	10.2	185	85.6	2.23 (1.13)
20. I would like to use PDEC-kit to assist me in my clinical practice.	212	98.2	5	1.9			6.39 (0.73)

* Likert scale 1-3 ('strongly disagree'= 1, 'disagree'= 2, 'slightly disagree'= 3) are categorised as disagree, 4 ('neither agree nor disagree'= 4) are categorised as neutral, 5-7 ('slightly agree'= 5, 'agree' = 6, 'strongly agree'= 7) are categorised as agree

Table 2: Comparison between the perception between students with and without dental extraction experience

	With experience		Without experience		<i>p-value</i>
	mean	SD	mean	SD	
1. The tools in the PDEC-kit are easy to use.	6.45	0.59	6.23	0.69	*0.012
2. The tools in the PDEC-kit are useful in providing post-dental extraction instructions.	6.51	0.68	6.40	0.63	0.236
3. The PDEC-kit will assist me in providing better post-dental extraction instructions to patients compared to providing verbal instructions only.	6.58	0.70	6.33	0.67	*0.007
4. Using the PDEC-kit will increase my confidence when providing post-dental extraction instructions to patients.	6.52	0.77	6.28	0.71	*0.021
5. The tools provided in the PDEC-kit is not sufficient for educating patients on post-dental extraction care.	2.81	1.83	3.03	1.51	0.345
6. I will not miss out on any post-dental extraction instructions with the aid of the PDEC-kit.	6.12	0.92	5.90	0.92	0.077
7. In my opinion, the visual and audio tools in the PDEC-kit can improve patients' understanding regarding the post-dental extraction instructions.	6.61	0.56	6.39	0.68	*0.008
8. The duration of the educational video in the kit is too long.	3.84	1.65	3.87	1.27	0.874
9. The information provided in the PDEC-kit is appropriate for patients who underwent dental extraction	6.50	0.61	6.14	0.81	*<0.001
10. As a dental student, the PDEC-kit will not improve my understanding of post-dental extraction care.	1.90	1.24	2.20	1.21	0.069
11. The PDEC-kit will provide significant benefits to my clinical practice.	6.41	0.93	6.21	0.70	0.084
12. The usage of the PDEC-kit is too time-consuming.	2.88	1.35	2.99	1.14	0.506
13. The PDEC-kit is a concise and precise patient education tool.	6.24	0.86	6.01	0.67	*0.033
14. Using PDEC-kit has more disadvantages than advantages.	1.92	1.33	2.17	1.16	0.142
15. The PDEC-kit will improve communication or rapport between dental students/practitioners and patients.	6.16	0.90	5.98	0.83	0.130
16. The length of the educational video in the PDEC-kit is appropriate.	5.27	1.26	5.15	1.29	0.467
17. As a dental student, the tooth model helps me understand the application of gauze pressure better.	6.32	0.83	6.10	0.67	*0.034
18. The tooth model will aid in guiding patients to apply gauze pressure correctly.	6.46	0.69	6.15	0.69	*<0.001
19. The flashcards are not beneficial in improving patients' post-dental extraction care.	2.06	1.15	2.39	1.09	*0.028
20. I would like to use PDEC-kit to assist me in my clinical practice.	6.53	0.71	6.25	0.74	*0.005

* $p < 0.05$

Upon comparison between the perception of two different clinical years, a significant difference is found in 15 out of 20 statements (Table 3). The posthoc test has revealed that significant differences are found mainly between year 3 and year 5 students (14 statements), followed by year 4 and 5 students (4 statements), and year 3 and 4 students (1 statement).

Table 3: Comparison between different clinical years dental students' perception on PDEC-kit.

	Mean (SD)			p	Significant post-hoc test's result
	Year 3 (n=69)	Year 4 (n=67)	Year 5 (n=80)		
1. The tools in the PDEC-kit are easy to use.	6.24 (0.69)	6.31 (0.68)	6.46 (0.57)	0.095	-
2. The tools in the PDEC-kit are useful in providing post-dental extraction instructions.	6.33 (0.61)	6.60 (0.78)	6.46 (0.54)	*0.037	Y3 - Y5 *p=0.034
3. The PDEC-kit will assist me in providing better post-dental extraction instructions to patients compared to providing verbal instructions only.	6.29 (0.62)	6.37 (0.74)	6.68 (0.67)	*0.001	Y3 - Y5 *p=0.002 Y4 - Y5 *p=0.021
4. Using the PDEC-kit will increase my confidence when providing post-dental extraction instructions to patients.	6.19 (0.73)	6.36 (0.81)	6.63 (0.64)	*0.001	Y3 - Y5 *p<0.001
5. The tools provided in the PDEC-kit is not sufficient for educating patients on post-dental extraction care.	3.30 (1.58)	2.57 (1.34)	2.88 (1.92)	*0.034	Y3 - Y4 *p=0.026
6. I will not miss out on any post-dental extraction instructions with the aid of the PDEC-Kit.	5.77 (0.99)	6.09 (0.83)	6.16 (0.92)	*0.025	Y3 - Y5 *p=0.025
7. In my opinion, the visual and audio tools in the PDEC-kit can improve patients' understanding regarding the post-dental extraction instructions.	6.39 (0.65)	6.43 (0.70)	6.65 (0.53)	*0.025	Y3 - Y5 *p=0.033
8. The duration of the educational video in the kit is too long.	3.87 (1.27)	3.81 (1.48)	3.89 (1.62)	0.942	
9. The information provided in the PDEC-kit is appropriate for patients who underwent dental extraction	6.10 (0.77)	6.28 (0.79)	6.54 (0.59)	*0.010	Y3 - Y5 *p<0.001
10. As a dental student, the PDEC-kit will not improve my understanding of post-dental extraction care.	2.35 (1.22)	1.97 (1.26)	1.85 (1.18)	*0.039	Y3 - Y5 *p=0.036
11. The PDEC-kit will provide significant benefits to my clinical practice.	6.20 (0.74)	6.16 (1.04)	6.53 (0.64)	*0.012	Y3 - Y5 *p=0.044 Y4 - Y5 *p=0.021
12. The usage of PDEC-kit is too time-consuming	3.12 (1.13)	2.84 (1.32)	2.85 (1.27)	0.326	
13. The PDEC-kit is a concise and precise patient education tool.	5.94 (0.68)	6.13 (0.74)	6.26 (0.85)	*0.040	Y3 - Y5 *p=0.031
14. Using PDEC-kit has more disadvantages than advantages.	2.41 (1.26)	2.13 (1.48)	1.65 (0.86)	*0.001	Y3 - Y5 *p<0.001 Y3 - Y5 *p=0.043
15. The PDEC-kit will improve communication or rapport between dental students/ practitioners and patients.	5.88 (0.83)	6.07 (0.86)	6.23 (0.87)	0.055	Y3 - Y5 *p=0.042
16. The length of the educational video in the PDEC-kit is appropriate.	5.17 (1.24)	5.22 (1.30)	5.24 (1.30)	0.952	-
17. As a dental student, the tooth model helps me understand the application of gauze pressure better.	6.01 (0.68)	6.31 (0.66)	6.29 (0.87)	*0.035	-
18. The tooth model will aid in guiding patients to apply gauze pressure correctly.	6.13 (0.73)	6.30 (6.50)	6.46 (0.71)	*0.016	Y3 - Y5 *p=0.012
19. The flashcards are not beneficial in improving patients' post-dental extraction care.	2.36 (1.04)	2.48 (1.27)	1.90 (1.00)	*0.040	Y3 - Y5 *p=0.031 Y4 - Y5 *p=0.005
20. I would like to use PDEC-kit to assist me in my clinical practice.	6.71 (0.79)	6.40 (0.68)	6.56 (0.73)	*0.005	Y3 - Y5 *p=0.003

*p<0.05

3.3 Open-ended Questions

Nearly all (208 out of 216) participants are able to identify various limitations of delivering verbal only post-extraction instructions based on their opinion (Table 4).

Table 4: The limitations of delivering verbal only post-dental extraction care instruction in dental students' opinion.

Limitations of verbal instruction	Percentage (%)
Difficult for patients to understand/ visualize	29.17
The patient might forget the instructions	37.04
Difficulty in getting patient's full attention	9.26
The dentist might forget to deliver important points	8.80
Language barrier	2.31
Misinterpretation of information	3.70
Limitation for patients with special needs	2.78
Limited time and information	3.24
Others	1.85
None	1.85
TOTAL	100%

More than half of the participants thought that the benefit of the PDEC-kit includes helping both patients and dentists to better understand post-dental extraction care instructions (30.6%) or assists dentists to deliver better instructions (25.9%). Other benefits mentioned by the dental students include aiding dentists not to miss any important points (10.7%), aiding patients to remember the instructions better (7.9%), simple and easy to use (7.9%), able to provide better patient education (6.0%), better visualisation (5.1%), the better rapport between dentist and patient (2.3%), and others (3.7%).

Upon questioning UiTM dental students' opinion on the disadvantages of the kit, 28.7% of the dental students have stated no disadvantage was noted for the kit. This is followed by 27.3% who thought that the usage of the kit was too time-consuming. Others thought that the educational video was too long (6.5%), too many tools (5.6%), not suitable for the whole population (4.2%), needed patient's attention (4.2%), bulky size (3.2%), some tools were not suitable (1.4%), unsure (1.9%), and others (10.7%).

On the other hand, a majority of the dental students (71.8%) thought that all tools were beneficial, while other suggested flashcards (11.6%), tooth model (4.2%), pamphlets (3.7%), smartphone application (3.7%), educational video (2.3%), unsure (0.9%), and others (1.9%) might be not beneficial.

Despite 37.8% of the dental students thought that all tools included in PDEC-kit were good, more than half of them suggested that the educational video (21.7%), smartphone application (13.8%), flashcards (12.0%), pamphlet (2.8%), and tooth model (2.8%) still needed to be improved. Meanwhile, 5.1% of participants have suggested other improvements should be made and 2.8% of them were not sure.

The dental students were inquired regarding their suggestions for additional tools to be included in the kit. While more than half of the dental students (58.3%) thought that the included tools were adequate, others have stated their suggestions (Figure 2). Six out of the eleven suggestions were already part of the kit. The students most probably have missed out on these items due to the showcase of an introductory video instead of a real-time face-to-face demonstration of the kit. The current PDEC-kit has included Braille's pamphlet for the blind and other specialised items will be

incorporated in future for different special need groups.



*Features that are present in the current PDEC-kit.

Figure 2: Suggestions for the additional item(s) to be included in PDEC-kit

Overall, the participants have provided a very positive response which most of them will buy the PDEC-kit to aid their clinical practice as dental students (86.6%) or in the future when they are practising dentists (94.4%).

4. DISCUSSION

The current survey was conducted to assess UiTM dental students' perception of a novel patient educational kit in assisting them to deliver post-dental extraction care instruction. A vast majority of the dental students agreed that the PDEC-kit was useful, easy to use, and could improve the patient's understanding regarding post-dental extraction care instructions.

This study has a very good response rate of 87.8% from UiTM clinical year dental students. A high 11:2 female-to-male participant's ratio corresponds to the high gender ratio of the undergraduate students for this field of study. Although all participants are in the clinical year of their study, half of them have no actual clinical experience of dental extraction on patients because of the impact of the COVID-19 pandemic. The undergraduate dental clinic has ceased operations for quite a long period due to the pandemic.

Overall, more than 92% (range: 92.2%-99.1%) of the dental students have agreed on all except one positive statement regarding PDEC-kit in the questions assessed by the Likert scale (Table 1). The only positive question that has a lower agreement score (Q16) is related to the appropriateness of the length of the educational video (69.4% agree, 22.2% neutral, and 8.3% disagree). The dental students might have been confused between the introductory video of the PDEC-kit that is used to brief them regarding the kit (8 minutes) for purpose of this survey, and the educational video used for information dissemination in the PDEC-kit (2 minutes).

On the other hand, the negative statements (Q5, Q10, Q12, Q14, and Q19) of the kit have a higher range of disagreement among the dental students (range: 63.4%-90.7%), which might be due to the confusion or carelessness upon reading the negative statements (Table 1). There is one outlier (Q8) in the negative statements of which only 36.6% of the students disagreed that the educational video was too long. However, this result is contradicting with the result of Q16, which most of the participants agreed that the length of the education video was appropriate. The same reason as mentioned above would most probably contributes to this result.

It was interesting to find out that dental students with dental extraction experience have given higher scores to the positive statements and lower scores to the negative statements (Table 2). These include the significant differences ($p < 0.05$) in nine positive statements and one negative statement. These findings have indicated that those with experience of dental extraction acknowledge the difficulties in delivering appropriate and effective post-extraction care instructions; thus, they appreciate the aids of PDEC-kit in their clinical practice better than those without experience of dental extraction. The significant difference of perception between students from different clinical years in three-quarters of the statements further supports the findings on the effect of clinical experience on participant's perception of the kit (Table 3). Generally, female dental students have rated higher mean scores for positive statements and lower mean scores for negative statements in the Likert scale. However, there is no specific pattern that can explain the statistically significant difference result between genders. These findings should be explored further in future studies.

Seven open-ended questions are incorporated in the survey to aid researchers to understand better the perception and opinion of the dental students. The dental students are able to appreciate the aims of the PDEC-kit as it is beneficial. Regarding the disadvantages of the PDEC-kit, many (27.3%) suggested that the usage of the tool was too time-consuming in view of the availability of different tools in the kit that portrays an impression of a needed long duration. Alternatively, the educational video can be displayed while the patients are waiting for their medication or bill. Meanwhile, the pamphlet and smartphone applications are targeted for home-care usage to enhance patients' understanding and memory after they have left the clinic. As every patient perceives information differently, PDEC-kit equipped with visual, audio, and tactile guides can cater to the needs of everyone. However, the possibility of reducing the duration for the usage of tools should be investigated. Besides, some (6.5%) have suggested the educational video was too long. This may be due to the confusion between the PDEC-kit introductory video with the educational video of the kit as mentioned previously. However, many (28.7%) of the participants have stated no disadvantages noted for the kit and this is very encouraging. This positive result is supported by the finding where the majority of the students (71.8%) thought that all tools in the kit were beneficial. Furthermore, there is a high percentage of the survey participants who would like to purchase the PDEC-kit to assist their clinical practice as a dental student (86.6%) or as a dentist in future (94.4%) signifying good marketability prospect for the PDEC-kit when it launches in future. Nonetheless, the efficacy of each tool and the PDEC-kit itself in delivering post-dental extraction care instructions is currently being investigated in a clinical trial.

The dental students only were aware of the shortcomings of delivering verbal post-dental extraction instructions and have suggested various limitations for it. This could have contributed to their positive perception of the PDEC-kit. It is difficult for the patients to understand brief verbal instructions delivered by the surgeons and other health care professionals [14]. On the other hand, there are suggestions for the improvement of the smartphone application (13.8%) and flashcards (12.0%). They can be improved to be more engaging and provide more features. The wide application of smartphones in the population nowadays creates a great opportunity for the

establishment of mobile health and mobile telemedicine through patient-orientated applications for patient education, disease self-management and remote monitoring of patients [9].

The participants have suggested including oral hygiene kits and “Dos and Don’ts checklist” in this patient education kit. An oral hygiene kit can be used to demonstrate proper oral hygiene care after the extraction and prevent unwanted practices such as brushing teeth vigorously, which potentially result in preventable complications. A checklist that acts as the simplified version of post-dental extraction care information will be very handy and easy to remember.

This study is an online survey and the participants were not able to view, touch, and experience the PDEC-kit in person as they were having online classes at home due to the pandemic situation. Physical experience with the PDEC-kit would have provided a better understanding of the kit. This is the main limitation for this study, which can be overcome easily in future studies when the dental students’ clinical sessions resume. Besides, approximately half of the participants have no clinical dental extraction experience poses another limitation to this study. However, these participants have completed all lectures and pre-clinical teaching on dental extraction related topics. They also had clinical exposure to dental extraction procedures when assisting their clinical partners. Furthermore, the experience of utilising the kit in post-extraction patients would enable the participants to provide more practical and useful comments. The findings from future multicentre studies with broader study groups involving general dental practitioners and dental patients to further address the limitations of the kit will be invaluable. Moreover, the effectiveness of the PDEC-kit shall be further explored with the clinical study on dental extraction patients.

5. CONCLUSION

Generally, PDEC-kit is beneficial based on UiTM dental students’ opinion, and they agreed that this kit can help them in delivering more effective post-dental extraction care instructions to their patients.

ACKNOWLEDGEMENT

The authors would like to thank Dr Mimi Syafiqa Ahmad Jafri, Dr Nur Aqilah Mohammad Zainuri, Dr Fazleen Zulzaidi, Dr Naquib Abdul Bari and Hilman Hussaini Hasmili for their dedication and efforts in developing the PDEC-kit.

REFERENCES

- [1] I. Miclote, J. Agbaje, Y. Spaey, P. Legrand and C. Politis, "Incidence and treatment of complications in patients who had third molars or other teeth extracted," *British Journal of Oral and Maxillofacial Surgery*, vol. 56, no. 5, pp. 388-393, 2018.
- [2] A. J. van Wijk, H. Buchanan, N. Coulson and J. Hoogstraten, "Preparatory information for third molar extraction: does preference for information and behavioral involvement matter?," *Patient Educ Couns*, vol. 79, no. 1, pp. 94-9, 2010.
- [3] W. P. Vallerand, A. H. Vallerand and M. Heft, "The effects of postoperative preparatory information on the clinical course following third molar extraction," *Journal of Oral and Maxillofacial Surgery*, vol. 52, no. 11, pp. 1165-1170, 1994.
- [4] D. Blinder, L. Rotenberg, M. Peleg and S. Taicher, "Patient compliance to instructions after oral surgical procedures," *Int J Oral Maxillofac Surg*, vol. 30, no. 3, pp. 216-9, 2001.
- [5] R.P. Kessels, "Patients’ memory for medical information.," *Journal of the Royal Society of Medicine*, vol. 96, no.5, pp. 219-222, 2003.

- [6] P. Ley, "Memory for medical information. British " *Journal of Social and Clinical Psychology*., vol. 18, no. 2, p.p. 245-55, 1979
- [7] S. Faheem, "Patients Compliance and Follow-Up Rate after Tooth Extraction," *IOSR Journal of Dental and Medical Sciences*, vol.16 no.5, pp. 115-120, 2017.
- [8] A.S. Mosa, I. Yoo and L. Sheets, "A systematic review of healthcare applications for smartphones," *BMC Med Inform Decis Mak*, vol. 12, pp. 67, 2012.
- [9] A.A Siddiqui, J.Y. Ismail and S. Kukunas, "Alveolar Osteitis: Patient's Compliance with Post-extraction Instructions Following Permanent Teeth Extraction," *The Journal of Contemporary Dental Practice*," vol. 19, no. 12, pp. 1518-1525, 2018.
- [10] K. A. Atchison et al, "A qualitative report of patient problems and postoperative instructions," *J Oral Maxillofac Surg*, vol. 63, no. 4, pp. 449-56, 2005.
- [11] R. E. Alexander, "Patient understanding of postsurgical instruction forms.," *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology*, vol. 87, no. 2,pp. 153–158, 1999.
- [12] P.S. Houts, R. Bachrach, J.T. Witmer, C.A. Tringali, J.A. Bucher and R.A. Localio, "Using pictographs to enhance recall of spoken medical instructions. Patient education and counseling," vol. 35, no. 2, pp. 83-88, 1998.
- [13] R. Gheisari, F. Resalati, S. Mahmoudi, A. Golkari and S.A. Mosaddad, "Do Different Modes of Delivering Postoperative Instructions to Patients Help Reduce the Side Effects of Tooth Extraction? A Randomized Clinical Trial," *J Oral Maxillofac Surg*, vol. 76, no. 8, pp. 1652 e1-1652 e7, 2018.
- [14] A. Mladenovski and J. A. Kieser, "The efficacy of multimedia pre-operative information for patients: a pilot study," *N Z Dent J*, vol. 104, no. 2, pp. 36-43, 2008.
- [15] K. Morte, C. Marengo, D. Lammers, J. Bingham, V. Sohn and M. Eckert, "Utilization of mobile application improves perioperative education and patient satisfaction in general surgery patients," *American Journal of Surgery*, vol. 221, no. 4, pp. 788-792, 2021.
- [16] S.K. Tan, M.S.F. Mohamad, H.A. Wahab, T.I.T.B Jamaluddin, and M.C. Mah, "An Oral Surgery Education Tool for Patient Care in Bridging Health Professionals and Communities through Innovation.," in *Bridging health professionals and communities through innovation*. Kedah, Malaysia: UUM Press, ch. 8, pp.47-52, 2020.