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1 **Title: Pre-Clinical to Clinical Transition Experiences of Dental Students at an**  
2 **Australian Regional University**

3 **Short running title: Clinical transition of dental students**

4 **Abstract**

5 **Introduction:** Clinical experience is a crucial component of dental education as it prepares  
6 students for real-world practice. Our study aimed to investigate the transition from pre-clinical  
7 to clinical training experiences of dental students at a regional Australian dental school.

8 **Materials and Methods:** A mixed-methods study was conducted using a survey and focus  
9 groups. Participants were dental students that recently transitioned into clinical training. Survey  
10 data was analysed quantitatively using descriptive statistics, whilst the qualitative data was  
11 thematically analysed using the conceptual framework of organizational socialization theory  
12 (OST).

13 **Results:** Forty eight of the sixty nine students in the cohort completed the survey and ten  
14 participated in the focus groups. The quantitative findings revealed that the transition was  
15 perceived to be abrupt and associated with a heavy workload. However, orientation sessions  
16 and engaging in chairside teaching made transitioning into clinical studies easier. The  
17 qualitative findings revealed that the transition process occurred in three phases. In phase 1,  
18 participants navigated the educational and social challenges using developmental  
19 characteristics such as resilience and positivity. Lessons learnt in phase 1 were used to make  
20 necessary learning adjustments in phase 2 and this subsequently enhanced developmental  
21 growth in the final phase, which helped ease the transition.

22 **Conclusion**

23 This study confirms that transitioning into clinical training can be complex. However, the  
24 educational and socialisation challenges associated with the transition can provide stimulating  
25 developmental learning opportunities that advance students' adjustments to the clinical  
26 environment with positive, empowering and motivational outcomes that facilitate a smooth  
27 transition.

28

29 **Key words:** Clinical transition; organizational socialization theory; education, students, dental  
30 education

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### 33 **Introduction**

34 Dental education primarily requires theory-based learning in the initial preclinical years, with  
35 the addition of supervised clinical patient-based activities in the clinical years.<sup>1</sup> In the clinical  
36 phase, application of theoretical knowledge to dental skills is emphasised through clinical work  
37 with real patients, which is critical in preparing students for future workplace practices.<sup>1</sup>  
38 Similar to other health professions, empirical research in dental education has revealed that the  
39 transition from pre-clinical to clinical training entails a variety of challenges.<sup>2-4</sup> These  
40 challenges include adaptation issues with professional socialisation and interprofessional  
41 collaboration, increased workload, lack of confidence in the application of theoretical  
42 knowledge and skills to real-world patient problems, as well as ongoing learning, educational  
43 expectations and assessment.<sup>5,6</sup>

44 Professional socialisation necessitates the acquisition of a set of particular values, skills and  
45 behaviours that align with the dental profession.<sup>7</sup> This process begins at entry into the degree  
46 pathway and continues throughout dental training and beyond graduation and their entry into  
47 the workforce<sup>8</sup>, however, its attainment could be arduous.<sup>9</sup> Furthermore, sudden increases in  
48 required working hours in the clinical stage of learning can affect students' performance and  
49 be a significant source of stress and fatigue.<sup>10</sup> Finally, clinical training requires real patient  
50 contact and added responsibility in relation to increased clinical workload which may impact  
51 on patient outcomes.<sup>11,12</sup> However, the risk of impact on patient outcomes can be mitigated by  
52 direct clinical supervision by experienced dental professionals.

53 Students' expectations of the volume of knowledge and skills required during clinical training  
54 is often different to their actual experience, as they often perceive they lack the required skills  
55 for effective clinical performance.<sup>13</sup> At the outset of clinical training, students are required to  
56 make connections between foundational theoretical knowledge acquired in the preclinical stage  
57 and the critical thinking, clinical reasoning and problem solving skills, which are essential for

58 the clinical care of patients.<sup>14,15</sup> For example, prior to clinical training, students' knowledge is  
59 often organised around discrete symptoms associated with dental presentations, however,  
60 subsequent application of this knowledge to make a differential diagnosis on the basis of signs  
61 and symptoms presented by real patients could be a source of uncertainty and stress to students.  
62 <sup>12</sup> Students also experience stress associated with mastering the required fine motor techniques,  
63 as well as patient and organisational systems-based management.<sup>12</sup> Furthermore, just like other  
64 health professions, learning and education in the dental clinic environment requires  
65 restructuring of knowledge, where students receive guidance and feedback on matters of  
66 personal, professional and educational development in the context of patient care.<sup>16</sup> The  
67 challenges are stimulated by diverse personal and institutional factors that make this  
68 transitional phase difficult, with the potential to cause negative impact on learning outcomes.  
69 <sup>17</sup> However, evidence suggests that challenges associated with transition can be addressed using  
70 three conceptual perspectives namely educational, social and developmental.<sup>18</sup> The transition  
71 to clinical work had been facilitated primarily from an educational standpoint, through the use  
72 of clerkship courses and curriculum-based innovations as strategies to address the problem.<sup>18</sup>  
73 Building relationships with staff, peers, and near-peers, as an example of social integration, has  
74 been identified as a way to reduce the anxiety and stress associated with transition.<sup>18</sup> From a  
75 developmental perspective, the use of reflection and transferrable learning skills, empowers  
76 students to take ownership of their learning and the transition experience.<sup>18</sup> Unfortunately,  
77 research addressing transition challenges from a developmental perspective are scant. Given  
78 that dental students enter into unsupervised clinical practice upon graduation, it is imperative  
79 that they successfully navigate their transitioning from pre-clinical to clinical training.  
80 Therefore, their transitional experiences at this stage of training need to be well understood by  
81 educators so that they can be successfully supported in order to minimise negative impacts and  
82 maximise experiential life-long learning opportunities.

### 83 ***Theoretical Framework***

84 Transition processes in health-related education are both emotionally and socially dynamic,  
85 and require students to develop the necessary expertise in their field of practice.<sup>19</sup> Theories on  
86 transitional psychology<sup>20</sup> or organisational socialisation theory (OST)<sup>21</sup> have been suggested  
87 as ways of exploring experiences and perceived challenges encountered during the transition.  
88 <sup>5</sup> OST<sup>21</sup> has previously been used by medical and nurse educators<sup>22,23</sup> though literature is  
89 scarce on its use in dental education. Exploration of students' pre-clinical to clinical transition  
90 experience based on this theory focuses on positive cognitive appraisal from a developmental  
91 perspective. This approach is aimed at identifying potential growth opportunities for students  
92 as they respond to the challenges posed by the transition.<sup>24,25</sup> It could aid the evaluation and  
93 quality assurance of training programs; including identification and amelioration of the  
94 challenges students encounter during this phase of study and forthwith facilitate smoother  
95 transitioning for the students.

96 OST was first described by Baur and Erdogan 2011<sup>21</sup> and adapted by Athlerley et al. (2016)<sup>22</sup>  
97 to suit transition in medical education. OST distinguishes between three phases of acquiring  
98 knowledge, skills and behaviours necessary to succeed in a new work environment.<sup>21</sup> Phase 1  
99 describes the characteristics of a newcomer which increase success tendencies (e.g.  
100 motivation), where behaviours such as seeking information and feedback ease the transition.  
101 Inclusive in this phase are the organisational socialisation efforts (e.g. formal orientation,  
102 realistic expectation of newcomers) which are necessary to facilitate the transition process.  
103 During phase 2, necessary adaptation factors such as self-efficacy, role clarity and knowledge  
104 of organisational structure help determine how well the newcomer is able to adjust to the new  
105 role. Phase 3 describes newcomer outcomes, such as turnover, satisfaction, performance, and  
106 dedication to work, which result from the accumulation of elements in phases 1 and 2.

### 107 **Study context and objectives**

108 The 5-year undergraduate Bachelor of Dental Surgery programme at James Cook University  
109 (JCU) delivers high quality training by providing some clinical exposure through observational  
110 placement at the end of their first year. In the second year, clinical exposure is obtained through  
111 community placements and experiences at the JCU Dental Clinic. In the final three years,  
112 students are exposed to extensive clinical experiences in the clinic, with dental treatments  
113 undertaken by students under the direct supervision of experienced dental professionals.

114 Adopting a mixed-methods approach, this study utilised a validated survey tool <sup>6</sup> and focus  
115 groups drawing on the adapted OST proposed by Atherley et al.<sup>22</sup>, to obtain insight into the  
116 educational, social and developmental perspectives of the transition experiences of dental  
117 students from pre-clinical to clinical studies at JCU. Information derived from this study could  
118 provide insights for curriculum modifications necessary to enhance students' learning and  
119 foster smooth transitioning through the process.

## 120 **Materials and Methods**

121 This study employed an explanatory mixed-methods approach, and included the collection and  
122 analysis of both quantitative (through surveys) and qualitative data (through open ended survey  
123 responses and focus groups). This study was conducted towards the end of the academic year,  
124 about six weeks before final exams. This timing allowed for student reflection on their  
125 experience through the year, thereby increasing their ability to provide information on their  
126 perception and experiences during the one year transition period. Ethics approval was granted  
127 by JCU Human Ethics Review Committee (H7853) and participation was voluntary.

### 128 ***Participants***

129 All Year 3 students in the JCU dental program (69 students) were invited to participate in this  
130 study. To encourage participation, the project was advertised in class one week prior to  
131 administering the survey. Additionally, as an incentive, participants were given the opportunity

132 to enter a draw to win one of three available \$50 gift cards. Students were assured of no adverse  
133 academic repercussions for non-participation, with staff not associated with the dental program  
134 responsible for both quantitative and qualitative data collection.

### 135 *Survey Instrument*

136 Students' perceptions of their transition experience from pre-clinical to clinical training and its  
137 effect on learning were assessed in September 2019 using a validated survey tool developed by  
138 Prince et al. (2005)<sup>6</sup>, adapted slightly for relevance to dentistry students. This 75-item  
139 instrument uses a 5-point Likert scale (1= strongly agree to 5 = strongly disagree) to assess  
140 students' perceptions of their experiences in relation to five (5) transition-related domains:  
141 professional socialisation, workload, patient contact, knowledge and skills, and learning and  
142 education. The last question in the survey was used to identify interested participants for the  
143 qualitative phase of the study.

### 145 *Focus Group Discussions*

146 Focus group discussions (FGDs) were conducted in October 2019 to further explore transition  
147 experiences and perceptions, and gain an in-depth understanding that cannot be obtained from  
148 a survey alone. This timing allowed for student reflection on their first semester experience  
149 within the clinical phase of their learning, thereby increasing their ability to provide insight  
150 into the factors that have aided or hindered their recent transition. The FGDs were conducted  
151 by researchers who were not involved in teaching and continued until data saturation was  
152 achieved. The discussions took place in informal classroom settings, were audio recorded, and  
153 lasted between 45-60 minutes each. Honesty and confidentiality were emphasised. The  
154 discussions were based on semi-structured open-ended questions that were generated based on  
155 emerging themes from the surveys as well as existing literature. The combined use of focus



156 groups and open ended responses (OER) provide unique contexts for data collection and  
157 explore different aspects of respondents' perceptions<sup>26</sup>

### 158 *Data Analysis*

159 Collected quantitative data was cleaned and analysed using SPSS v23 (IBM Corp, Armonk,  
160 NY, USA). Descriptive statistics were used to present participants' demographics and scores  
161 for each survey item. FGDs were audio taped, transcribed and coded by three of the researchers  
162 (MA, FA and BSM) and discrepancies were resolved through a consensus meeting. The  
163 qualitative data from the open-ended survey questions and FGDs were analysed using the  
164 adapted OST framework proposed by Atherley et al <sup>22</sup>.

### 165 *Triangulation of Findings*

166 An interpretivist paradigm which provides meaning to subjective experiences of individuals <sup>27</sup>,  
167 was utilised in triangulating findings (i.e. identifying, discussing and mapping convergent  
168 themes) from the quantitative and qualitative datasets to increase the rigor and trustworthiness  
169 of the data. Illustrative quotes are reported verbatim to support the findings.

## 170 **Results**

### 171 *Quantitative Phase*

172 Completed survey responses were received from 70% of the invited participants (48/69  
173 students). The demographic characteristics of the participants are presented in **Table 1** and  
174 representative of the cohort profile, with mostly female students. The participants' mean age  
175 was 22.30±3.41 years (range 19-34 years), they were mostly (71%) females, identified as  
176 domestic students (83%), lived in a major city prior to attending JCU (54%), and had no prior  
177 health professions education experience (88%). Ten students participated in the semi-  
178 structured FGDs; two males and eight females, two who were international students and eight  
179 domestic students.

180 **Table 2** presents participants' mean scores for the five assessed domains:  $3.52\pm 0.97$  for  
181 transition and professional socialisation,  $3.52\pm 1.03$  for workload,  $3.04\pm 0.95$  for patient contact,  
182  $3.77\pm 0.87$  for knowledge, knowledge application and skills, and  $3.81\pm 0.90$  for learning and  
183 education.

#### 184 *Transition and Professional Socialisation*

185 Most students felt the orientation program at the beginning of their clinical year made the  
186 transition into clinical studies easier (58%) and agreed that it is vital for dentistry students who  
187 are new to the clinical space (92%). They were able to collaborate well with their peers (83%)  
188 and felt the first semester of clinical experience was better than anticipated (85%). However,  
189 only few students felt well-prepared for clinical training (27%) and ready to start the training  
190 (10%). Most students felt nervous at the start of clinical training (83%) and needed time to  
191 adjust to the new environment (85%). About half of the students perceived the transition to be  
192 abrupt (48%) with the first week in clinical training being difficult (54%).

#### 193 *Workload*

194 With regards to workload, the majority of students found it to be heavy (85%), and felt there  
195 was a wide disparity between the workload in their clinical studies compared to the pre-clinical  
196 phase (65%). Most students also found working in the dental clinic tiring, and had difficulty  
197 adjusting to work routine (63% and 54% respectively).

#### 198 *Patient Contact*

199 Students were strongly in favour of acquiring and retaining knowledge through contact with  
200 patients (96%), though almost half would have preferred having real patient contact early in  
201 the curriculum (48%). Many students were comfortable communicating with patients (92%)  
202 and performing examinations (92%).

#### 203 *Knowledge, Knowledge Application and Skills*

204 Most participants (67%) found the knowledge acquired in the pre-clinical phase relevant to the  
205 clinical phase, though only a few felt they had sufficient theoretical knowledge for placement  
206 (35%). Similarly, most students felt they were able to apply their knowledge in practice (83%),  
207 though they attested to having gaps in their knowledge (69%) and indicated that they required  
208 a different type of knowledge for clinical practice (58%). Most participants (50-63%) had  
209 sufficient knowledge related to basic, clinical and behavioral sciences. With regards to skills,  
210 although only about half of the students felt they were prepared for clinical performance (42%),  
211 most felt comfortable in performing clinical procedures such as dental examination (98%),  
212 taking history (96%) and full oral assessment (90%). Most (75%) of the students felt well  
213 prepared in relation to communication skills, and only a few felt they had difficulties  
214 recognising pathological symptoms (38%).

#### 215 *Learning and Education*

216 All students perceived engaging in chairside teaching as the most useful activity in clinical  
217 learning. Nearly all participants engaged in independent study, and easily remembered the  
218 knowledge acquired in clinical practice (94%), with problem-based learning thought to be good  
219 preparation for practice by most participants (56%). Simulated patients (SPs) were seen as a  
220 useful learning tool by nearly half of the students (44%), and most agreed to learning a lot from  
221 SPs (52%). Students also learnt a lot from clinical staff (52%) and regarded junior and senior  
222 staff as good teachers (83% and 81% respectively). Many students confirmed that assessment  
223 guides their learning (88%), though almost half of them felt they had forgotten most of their  
224 theoretical knowledge (48%).

#### 225 *Qualitative Phase*

226 The findings from the open-ended survey responses and FGDs were interpreted based on  
227 Atherley et al's <sup>22</sup> adapted model of OST as outlined in **Figure 1**. This model provides an

228 understanding of the three conceptual transition perspectives and how participants adapt to the  
229 changes encountered to foster smooth transitioning.<sup>18</sup>

230 **Phase 1** comprised of newcomer characteristics, newcomer behaviour and organisational  
231 efforts. The *newcomer characteristics* that increased success tendencies were positivity,  
232 resilience, self-regulation and use of previous experience.

### 233 *Positivity*

234 Generally, all the students stated that the transition was abrupt, challenging and associated with  
235 feeling of being overwhelmed.

236 *“You know, it's all those little things, because there's so much to remember and it is very  
237 overwhelming, it's very abrupt.” (Male, FGD).*

238 Nonetheless, they understood the negative impact of stress in the clinical learning environment  
239 and the need to remain calm and comfortable.

240 *“To think critically, to analyse critically and see what the problem is with the patient, you need  
241 to be comfortable and you can't have this adrenaline or like stress in you, because that kind of  
242 just hazes everything.” (Female, FGD).*

### 243 *Resilience*

244 Students acknowledged that resilience and determination to do well in clinical training is  
245 important for successful transitioning.

246 *“Just accepting that I am the student and even if the supervisor is horrible or something, I just  
247 go ‘Ok, I am the student, I’m here to learn’. I’m just going to keep going” (Male, FGD).*

248 *“...we just have to toughen up and take it how it is” (Female, FGD).*

### 249 *Self-regulation*

250 Many students felt personal reflection on daily activities is important for smooth transition.

251 *“I write personal reflection on each day in the clinic: what went well and what didn’t. This*  
252 *helped me learn from my mistakes and remember tips and tricks from supervisors.” (OER).*

253 Also, students found it important to prepare ahead for the day and have the willingness to ask  
254 for clarifications on difficult topics.

255 *“Preparing for each clinical day. Studying materials before appointment. Coming to the clinic*  
256 *completely pre-reading and preparing to clarify unsure topics with clinic supervisors.” (OER).*

257 In addition, students recognised that they had to put in extra effort into developing problem  
258 solving and self-directed learning strategies.

259 *“You have to figure it out on your own, really. You put a lot of extra time on your own, just*  
260 *studying.” (Female, FGD).*

#### 261 *Previous experience*

262 A few students indicated that their previous experience either as a dental assistant or other  
263 health-related roles prepared them for the transition to clinical training.

264 *“Having worked as a dental assistant, I am aware of what is expected of a dentist, to be*  
265 *organised and how to interact with patients.” (OER).*

266 *“Obviously doing dental assisting isn't the same as being the operator but it's just like one*  
267 *step...everything that's going on and you're watching it from an outsider's perspective, and*  
268 *that's all you need. You just felt so much more prepared.” (Female, FGD).*

269 However, some students felt that it wasn’t their responsibility to seek out extracurricular  
270 opportunities that would aid their transitioning.

271 *“I don’t think we should have to do extra things in order to prepare for something that we*  
272 *have to do at the university. We are here to learn what we need to do in there [in the clinic].*  
273 *We should not have to do extracurricular things to have the basic knowledge that we need to*  
274 *be able to be good operators.” (Female, FGD).*

275 ***Newly developed behaviours*** that eased the transition into the clinical learning environment  
276 included proactive information seeking, feedback seeking and relationship building. The  
277 approach used/behaviours developed were related to both the educational and social  
278 perspective. Information and feedback seeking were related to the educational perspective and  
279 relationship building was related to the social perspective.

#### 280 *Information seeking*

281 To augment and ease their transition, many students obtained information from senior students  
282 “*At the start we felt like we know nothing. I always have to ask someone in the upper year, a*  
283 *senior year student.*” (Female, FGD).

#### 284 *Feedback seeking*

285 All students also proactively sought feedback during the transition to improve their  
286 performance of clinical skills. “*I asked the assessor, ‘What could I have done better? What did*  
287 *I do wrong?’*” (Male, FGD).

288 However, there were mixed feelings about the quality and amount of feedback received. “*I*  
289 *know there's some supervisors that do, but I find that a lot of supervisors don't give enough*  
290 *feedback.*” (Female, FGD).

#### 291 *Relationship building*

292 Building rapport and establishing mentoring relationships with seniors, supervisors and peers  
293 were prominent aspects of the transition. “*You need to work in a great practice where you have*  
294 *a mentor and someone to talk to.*” (Female, FGD).

295 “*We depend on each other a lot, we learn from each other, we help ourselves. If we had a bad*  
296 *day at clinic you just end up feeling down and then you leave the day and go back to your*  
297 *friends. That's what we really do.*” (Female, FGD).

298 As stated by the participants, “*There are helpful encouraging supervisors that encourage you*  
299 *to expand scope, practice new skills and test theoretical knowledge in a clinical setting in a*  
300 *non-judgmental manner.*” (OER). However, many students perceived that building such  
301 relationships with some clinic supervisors may be difficult in reality. “*Some clinical staff are*  
302 *not understanding that we are doing things for the first time, not being considerate.*” (OER).  
303 Nevertheless, some students still felt such relationship could be built. “*We’ve had a new*  
304 *supervisor that’s come in saying, ‘I don’t care if you can’t do this. That’s why I’m here - to*  
305 *help.’*” (Male, FGD).

306 **Organisational/ institutional factors** that could influence the transition process included  
307 formal orientation programs, socialisation tactics and organisational insiders. Both educational  
308 and social perspectives were considered in the identification and management of the  
309 organisational factors. Organisation of formal orientation programs related to educational  
310 perspective, while socialization tactics and organizational insiders reflected social  
311 perspectives.

#### 312 *Formal Orientations*

313 Participants acknowledged the efforts made by the dental faculty to organise orientation  
314 programs in order to facilitate smooth transitioning. However, they noted that the orientation  
315 into clinical training could have been done earlier and more targeted to meet their learning  
316 needs:

317 “*We have a week called the clinical foundations where it is a couple of days in the clinic. I*  
318 *don’t think that clinical week was adequate at all. Just practicing an injection, numbing each*  
319 *other up. That wasn’t enough.*” (Female, FGD).

320 *“Foundation week, just prior to the clinic should be longer in order to learn and get used to*  
321 *the [Titanium] program as well. I found the clinical foundation week extremely insufficient to*  
322 *adequately prepare for clinic.” (OER).*

323 Students wanted topics such as *“Scale and clean techniques at the start”* and felt *“more*  
324 *comprehensive teachings on 012’s would be helpful.” (OER).* They also felt that more exposure  
325 to clinical skills in the pre-clinical years could have better prepared them for the transition.  
326 *“Hold more student sessions where we could practice doing cleans, rubber clamps on each*  
327 *other at the earlier stage e.g in the 2<sup>nd</sup> year.” (OER).*

#### 328 *Socialisation tactics/ networks*

329 Participants stated the need for faculty to facilitate socialisation networks with the provision of  
330 academic mentors to aid transition.

331 *“Something that I think would be very helpful would be to have this sort of network where*  
332 *there’s a third year and a fourth year and even a fifth year who’s doing placement or something,*  
333 *or one of the supervisors, and you have like a network like that.” (Female, FGD).*

334 Similarly, students highlighted the importance of support systems, *“Relatable mentors,*  
335 *guidance, personalised advice aiming at bringing out the best in you (OER).”* and stated that  
336 interactions with recent graduates emphasised the importance of having mentors. *“If you talk*  
337 *to recent graduates, a lot of them require a lot of mentoring, and that happens throughout your*  
338 *career” (Female, FGD).*

#### 339 *Organisational insiders*

340 Clinical supervisors are crucial organisational insiders who have significant influence on the  
341 students’ transition experiences.

342 Nevertheless, some students stated that the support received from the supervisors aided their  
343 learning and clinical dental experience.



344 “...So I just feel like I perform better as well as a clinician on the days that I get supervisors  
345 that I feel comfortable working with, ...whereas some other days, some supervisors are just -  
346 you know, they're more than willing to help you out, because they know you're just starting  
347 your career (Female, FGD).

348 Perception of non-judgmental personality exhibited by the junior supervisors reduced anxiety  
349 and intimidation felt by students:

350 “Because I know they are less judgmental, they understand you because they have recently  
351 been in the same situation. I have no problems asking them stupid questions or things different  
352 supervisors considered stupid.” (Female, FGD).

353 **Phase 2** relates to newcomer adjustments: students’ adaptation to clinical training was  
354 impacted by factors such as role clarification, team dynamics in the work environment, support  
355 networks and knowledge application.

356 *Role clarification/ Clinical scope*

357 Many students were uncertain about their roles in the clinic and felt clear explanation of  
358 expectations during orientation would have been useful.

359 “Something that frustrates me is the inconsistency on role. I had a supervisor ask me if we’re  
360 allowed to do extractions, whereas I know some of us already did extractions but we are not  
361 allowed to. It is inconsistent. Just an information session at the start, like this is what is  
362 expected of them. This is the level we expect. Making expectations clear from the start would  
363 be nice.” (Female, FGD).

364 *Team dynamics/ Organisational culture*

365 All the students expressed concerns in relation to team dynamics. They felt uncertain about  
366 what to do, especially in situations where there are conflicting recommendations from  
367 clinicians to patients.

368 *“Sometimes you have the same patient, and they will have to see different supervisors during*  
369 *different appointment. One supervisor would have recommended a treatment and the other*  
370 *doesn't. One can be very preventative and the other one will go for the most invasive approach*  
371 *on it. Such variation is huge” (Female, FGD).*

#### 372 *Workload*

373 Students were concerned about the workload and level of knowledge they felt they had to  
374 acquire during training.

375 *“In a five-year course, there's lot of content that's been given out. Obviously, when we finish*  
376 *this course, we are expected to know it all as fully competent dentists.” (Female, FGD).*

377 *“There's too much content, you can't know everything.” (Male, FGD).*

378 This affected adjustment to the training and approach to learning. Increased workload also  
379 impacted on students' time management ability. *“Balancing university schedule and studying*  
380 *at the same time. At times, it is difficult to go and continue studying after a day of learning*  
381 *lectures and treating patients in the clinic.” (OER)*

#### 382 *Acceptance by organisational insiders and support*

383 The participants emphasised the need to be accepted and supported by the members of staff in  
384 the clinics to make the transition process easier. Students' inability to measure up to the high  
385 expectations from some staff members was met with criticism.

386 *“Some staff assume we already know how to carry out clinical work, even though we may not*  
387 *have been taught about it and judge us based on that (OER).”*

388 Some students struggled with their ability to answer questions from supervisors. *“When*  
389 *supervisors start firing questions. I get so stressed and I start to clam up.” (Female, FGD).*

390 Lack of a consistent level of guidance from the clinicians was a source of concern for some  
391 students during the transition. This made students turn to their peers and seniors for academic  
392 and emotional support which aided their transition. Students learnt from their peers by  
393 comparing notes.

394 *“At the end of each day, we talk about our day, compare notes about supervisors, where we’ve*  
395 *made a mistake so others don’t have to do it...we rely on each other a lot.” (Female, FGD).*

396 In addition, the students recognised that guidance by seniors was critical to assist them.

397 *“Allocate upper years as mentors for clinic.” (OER). “It would be helpful to have a sort of*  
398 *network where there’s a third year, a fourth year and a fifth year who is doing placement.*  
399 *You’re all in the same bag. It could be once a month, where you talk about consistency, you*  
400 *understand expectations and ask questions about procedures.” (Male, FGD)*

401 *Self-Efficacy*

402 Although all the students noted that existing pre-clinical training on communication skills was  
403 adequate but they experienced difficulty in the practical application of theoretical knowledge  
404 into clinical practice.

405 *“I actually was quite impressed by the amount of people content that is in this degree. We do*  
406 *communication subjects, we do lifespan development - there is a huge focus. The downfall is*  
407 *they haven’t actually integrated that very well.” (Male, FGD).*

408 Additionally, the students expressed concerns about their level of confidence in communicating  
409 appropriately with clients in the early transition days and felt their foundational knowledge on  
410 the subject was inadequate. *“In the first few weeks, I was freaking out in clinic because I’m*  
411 *like, ‘Am I saying this right? Am I not offending this client? Communicating theory in my head*  
412 *into suitable words for patients understanding was challenging.” (OER).*

413 Although the survey results showed that students were comfortable communicating with  
414 patients, some students felt the anxiety experienced in relation to their communication skills,  
415 particularly in building rapport with senior clinicians was due to insufficient preparation during  
416 pre-clinical training on the subject.

417 *“I feel that the first few years of college neglected the fact that dentistry is a very heavily based*  
418 *people-based thing. And that’s really crucial when you are talking to someone.” (Female,*  
419 *FGD).*

420 **Phase 3:** The transition experience effectuated beneficial outcomes for the students and  
421 enhanced their learning opportunities by triggering internal motivation, personal and  
422 professional development and commitment/ transferability of learnt skills.

#### 423 *Internal motivation*

424 Many students stated that the learning experience in clinical years helped emphasise the value  
425 of intrinsic motivation to learn. In their pre-clinical years, they had placed a lot of emphasis on  
426 scoring high grades.

427 *“A lot of people, me as well, at the beginning put a lot of emphasis on what mark I get and that*  
428 *rules my day. If I walk out of a session and I only got a satisfactory grade, I’m like ‘Oh, I should*  
429 *have done better’ but if I get excellent, I’m like ‘Wow, I rule the world’. But its’ not real”*  
430 *(Female, FGD).*

431 This viewpoint changed during the clinical training where they saw the need to look beyond  
432 scoring high grades to gaining the required knowledge to practice safely in the profession.

433 *“I don’t care what grade I get but I need to learn from this because at the end of the day, a*  
434 *dentist that gets all passes or that who gets whatever, they’re still going to be dentist. So, I’m*  
435 *going to ask whatever question and get the learning that I need.” (Female, FGD).*

436 *“Considering that we’ve gotten to the third stage of the journey, all we’re trying to do is*

437 *maximize our learning and constantly trying to aim to do better. We try to focus on what we*  
438 *need to learn at this current stage.” (Female, FGD).*

439 *Personal and professional development*

440 Students developed a deeper understanding of the pathway to professional identity and stopped  
441 being unnecessarily critical of themselves.

442 *“It takes a while to learn. So one needs to understand that and be easy on yourself. Sometimes*  
443 *if I’ve had a bad day at the clinic, I just take the night off.” (Female, FGD).*

444 They became more aware of the importance of continuous practice and having the right attitude  
445 to learning

446 *“You don’t need to know everything. As long as you have the attitude to learn. Talking to a*  
447 *recent graduate as well. They said, you don’t get it until three years after uni, so you don’t*  
448 *need to think that you have to be perfect right now.” (Female, FGD).*

449 In addition, the students emphasised the importance of patient-centered care to ensure good  
450 patient outcomes.

451 *“This is the patient we have to care for, so I’m going to sacrifice whatever... I do something*  
452 *that’s good for the patient...” (Female, FGD).*

453 *Commitment and transferability of skills*

454 Ultimately, students appreciated dental clinical training despite the challenges they  
455 experienced.

456 *“I guess the tricky thing is that you can only be so prepared. What I love about this degree is*  
457 *that, I did science and all that then (in previous degree) and it was theory and I never got to*  
458 *apply it. Whereas in this degree we’re in there doing it and its’ the best way to learn.” (Male,*  
459 *FGD).*

## 460 **Triangulation of findings**

461 The FGDs revealed that students commence the clinical training journey as newcomers in  
462 **Phase 1** by drawing on prior characteristics and skills such as positivity and resilience which  
463 had been developed during the pre-clinical years. These developmental characteristics aided  
464 success tendencies and helped the students to identify their learning needs. Characteristics and  
465 skills such as self-regulation and drawing on previous experiences were used to navigate  
466 through the educational and social challenges encountered in the new learning environment.  
467 As indicated in both the quantitative and qualitative results, the educational challenges included  
468 heavy workload, gaps in knowledge and feelings of unpreparedness for clinical practice; while  
469 the social challenges were abrupt exposure to the clinical environment which created anxiety  
470 in relation to their communication and interaction with some of the organisational insiders  
471 (senior clinicians) though many students were comfortable communicating with patients. From  
472 a developmental perspective, the students were able to use their characteristics to positively  
473 influence their behaviour by seeking out information and feedback to fill their knowledge gaps.  
474 They also identified areas such as relationship building and socialisation networks that could  
475 ease the transition process and assist them in navigating through the organisational factors in  
476 the new learning environment. In **Phase 2**, integration of the three (3) perspectives helped the  
477 students (newcomers) to recognise important learning opportunities such as chairside teaching  
478 sessions, self-directed and problem-based learning in the clinical environment. This enabled  
479 them to make necessary adjustments in relation to role clarification, team dynamics, support  
480 networks and knowledge application. The adjustments made were used in **Phase 3** to further  
481 develop their understanding and promote positive outcomes like internal motivation, personal  
482 and professional development, commitment and transferability of learnt skills. The outcomes  
483 identified in **Phase 3** underscores the importance of the developmental perspective of  
484 transition. Towards the end of the transition process, the students placed more emphasis on

485 maximizing their learning by proactively addressing their learning needs, thereby promoting  
486 professional development.

## 487 **Discussion**

488 This study has provided insight into students' experiences of transitioning into the clinical  
489 environment in dentistry and highlighted opportunities to enhance and support students'  
490 learning. By using a mixed-methods approach, this study facilitated an in-depth understanding  
491 of the developmental stages in the transition process, including the students' characteristics,  
492 adjustments made and the eventual outcomes, which are focused on professional identity and  
493 patient-centred care. The study findings indicate that despite the challenges surrounding the  
494 transition, students had a positive outlook and relied on peers and seniors for both emotional  
495 and academic support. Students changed learning patterns, became better reflectors and  
496 collaborative learners.

497 The results of the quantitative data analysis revealed that participants' learning and education  
498 had the highest level of smooth transitioning. The causal effect could be explained by the focus  
499 group findings which indicated that students were more engaged with their learning during  
500 clinical training, as characterised by the use of self-regulation and personal reflection. Self-  
501 regulation is an effective learning strategy for dental studies.<sup>28</sup> This is because of its  
502 effectiveness as a learning method, where students are proactive to acquire the necessary  
503 academic skills through personal exploration of their level of knowledge and by taking  
504 initiatives to fill any knowledge gaps.<sup>29</sup> This was also revealed in the FGDs, where participants  
505 were able to seek feedback to improve their performance on clinical skills. Self-regulated  
506 learning skills such as goal setting, planning, self-monitoring and self-reflection<sup>30</sup> have been  
507 considered as essential competencies for students to attain their academic goals and expertise

508 development.<sup>28,29,31</sup> Therefore, targeting development of these skills earlier in students'  
509 learning may prove useful for smooth transitioning.

510 Our themes on the student experiences on transitioning into dentistry were similar with the  
511 notions of Bauer and Erdogan's OST<sup>21</sup>, which describes three consequential phases in the  
512 transitioning model. Our participants' characteristics, behaviours as well as the organisational  
513 support they received, all played a role during phase 1 of the transition into their clinical  
514 training. Even when students perceived the transition was *abrupt, challenging and*  
515 *overwhelming*, they had a positive outlook on their training and refused to allow any negative  
516 impact of stress to deter their learning. It is an established fact that transition causes stress, but  
517 resilience<sup>32</sup> may help achieve favourable outcomes despite stressful situations.<sup>33</sup> Therefore, it  
518 may be important to focus on the developmental perspective and encourage and empower  
519 students to be resilient, to recognize learning opportunities and to proactively use them to  
520 develop their understanding and practice in the new learning environment.<sup>25</sup> Empowering  
521 students promotes personal and professional development by optimising learning strategies and  
522 encouraging reflection.<sup>24</sup>

523 In line with previous studies<sup>34,35</sup>, collaboration with peers and senior students was a major  
524 behaviour and coping mechanism among the students in this study. These relationships assisted  
525 students in having realistic expectations of their level of knowledge, skill aptitude, and acted  
526 as a professional support system. Therefore, facilitation of these supportive peer networks is  
527 imperative in dental training and transitioning. Assigning scheduled teaching times for students  
528 to share notes and discuss clinical case scenarios with peers, providing them opportunities to  
529 liaise with seniors from an early period in their degree pathway may be some of the ways to  
530 facilitate such support systems. Increasing the opportunity for peer-assisted learning and senior  
531 mentoring during dental training could be cost effective for knowledge exchange, building  
532 students' confidence and competence on problem-solving and decision making in the clinic.<sup>36</sup>



533 The importance of such support systems for smooth transitioning cannot be overemphasized  
534 because it has the ultimate advantage of building collaborative learning communities within  
535 the institution.<sup>37</sup>

536 Students noted that organisational/ institutional effort of providing orientation was useful in  
537 assisting their initial transition, although some would have preferred an earlier orientation.  
538 Improvements in the orientation program might assist in minimising the perceived '*abruptness*'  
539 and nervousness experienced at the start of transition as noted in the quantitative and qualitative  
540 results, thereby making learning more efficient and effective.<sup>38</sup> This could be fostered through  
541 orientation and information sessions in the preceding year, in order to prepare and improve  
542 student awareness of their roles and supervisors' expectations once they reach the clinical  
543 training stage of their degree.<sup>35,38</sup> This is more likely to be improved through supervisor  
544 orientation and such timing may limit or eliminate the complexities of role clarification issues  
545 experienced by students in the current study. Nonetheless, students who are proactive in  
546 seeking clarification of their role are more likely to eventually experience smoother transition.  
547<sup>19,21</sup> Furthermore, earlier orientation could provide evidence-based context for basic theoretical  
548 topics, opportunity to build team working skills, interpersonal and communication skills prior  
549 to commencement of clinical training.<sup>35</sup> Likewise, students noted socialisation tactics and  
550 networks in the form of academic mentors as essential factors, which could aid transition. The  
551 use of mentors are well documented strategies for guiding aspiring professionals in developing  
552 the knowledge and skills required in their chosen profession.<sup>21,39</sup> Clinical and institutional  
553 training of seniors to be mentors could promote socialisation with younger students and may  
554 reduce intimidation. Choosing an educational supervisor or college tutor as a mentor should be  
555 avoided since they have to make appraisals and assessments of trainees and hence role  
556 confusion may result.<sup>40</sup> In addition, clinical supervisors were highlighted as important  
557 components of the organisational efforts to optimise transition. Theoretically, supervision

558 serves the key function of been normative (oversight of quality control and patient safety),  
559 restorative (fostering emotional support and process) and formative (facilitating mentee's skill  
560 development)<sup>41</sup>, thus, reflecting the encompassing and impactful role of supervisors on the  
561 personal, emotional and professional development of trainees. Therefore, clinical directors  
562 could consider periodic training and evaluation of supervisors to ensure maintenance of good  
563 practice essential for successful transition of dental trainees. Additionally, clear lines of  
564 communication and collaboration are needed between all parties (students, supervisors, and  
565 universities) to reduce inconsistencies in expectations and supervisor activities, and assist in  
566 building rapport and relationships.

567 Divergent approaches of supervisors to patient issues was a source of stress and uncertainty for  
568 students, which corroborates other studies.<sup>35</sup> Due to the multitasking nature of clinical setting,  
569 receiving conflicting opinions from supervisors about patient management could cause  
570 disorientation, increased anxiety in students and discouraging factor for inducing deep learning  
571 approach.<sup>35,42</sup> Therefore, an organisation's effort to optimise transitions could include training  
572 supervisors on team dynamics in patient management to adequately support students in this  
573 regard highlighting the role socialization plays in the transition process. Furthermore, the  
574 negative impact of increased workload on students transitioning to clinical study was evident  
575 in the quantitative results. This result is similar with previous reports.<sup>6</sup> Perceived high levels  
576 of workload could lead to cognitive overload where students have too much information to  
577 process.<sup>43</sup> When students have difficulty processing the novel information encountered in  
578 clinical years, it prevents adequate application of previously stored knowledge. Re-evaluation  
579 of educational approaches to providing instructional model to optimise cognitive load for real  
580 life learning<sup>43</sup> might be effective in facilitating clinical transition.

581 While the educational and social perspectives have problematised students' struggles during  
582 the transition and reported ways to minimise the particular struggles, the third perspective

583 (developmental) emphasises the need for students to be able to cope with change and  
584 proactively fill in the educational and social gaps by engaging in positive self-regulated  
585 learning activities.<sup>18</sup> Students were aware of their need to remain positive and demonstrate  
586 resilience/determination, self-regulate, and reflect despite the overwhelming nature of  
587 transitioning into clinical practice - mental health training and support (non-clinical knowledge  
588 and skills) should be an integral part of their curriculum to assist in the development of these  
589 key skills and prevent adverse mental issues. Despite challenging experiences during phases 1  
590 and 2, students felt empowered, motivated and committed to their training program. They  
591 developed personal and professional identity and could recognise the applicability of the  
592 knowledge acquired in pre-clinical training to the clinical stage. This reflects the acceptance of  
593 the professional task and gradual attainment of stability through the transition process. Students  
594 were more patient-centred and motivated to engage in peer support and become competent for  
595 clinical practice rather than been competitive in achieving high grades. These findings confirm  
596 that professionalism and skill acquisition in a professional career is ongoing, step-wise,  
597 cumulative and cannot be fully attained at once.<sup>44,45</sup>

598 Taken together, it is recommended that health education institutions need to focus on  
599 conceptualising the transition to clinical training from a developmental perspective as this  
600 approach leads to creation of strategies aimed at empowerment and smooth transitioning.  
601 Evidence suggest that the use of self-directed learning skills such as reflections, journals or  
602 portfolios towards the end of the pre-clinical year helped the students to recognize key  
603 experiences and promoted professional development.<sup>7,46</sup> Given that there are limited studies  
604 that have approached the transition process from a developmental perspective, more studies are  
605 needed to investigate the effect of this perspective on the transition process. Overall, there is a  
606 need for an integrative approach towards the transition process using developmental,  
607 educational and social strategies to help students make a seamless transition to the clinical

608 years. Areas to consider include the provision of adequate peer/ mentoring support systems to  
609 improve positivity, self-regulation and resilience in students. In addition, there is need to  
610 provide students with clarity of roles in clinics, improvements in clinical orientation and  
611 opportunity for socialisation with peers and seniors. This could foster better adjustment,  
612 provide internal motivation, enhance personal and professional development which could  
613 eventually optimise smooth transitioning and better performance during the training.

#### 614 **Strengths and Limitations**

615 The findings of this study are of value to health professions educators, academic leaders and  
616 curriculum developers as well as clinical supervisors. The study provides rich data about  
617 student experiences and elaborates on developmental approaches to enhancing students'  
618 progression and transition to clinical training. The use of the conceptual framework to interpret  
619 our findings within the dental education context is novel and in line with the requirement for  
620 exploratory transition studies that focus on the developmental perspective<sup>18</sup>. However, there  
621 are some limitations to the generalisations of the study findings. First, when results are based  
622 on subjective information, reliability may be compromised. Nevertheless, the similarity  
623 between the responses in the quantitative data, open-ended questions and focus group  
624 discussions support the reliability and validity of this study. Secondly, self-reported  
625 perceptions and experiences by students, and inability to confirm with teaching staff and actual  
626 happenings at the clinic is another limitation of this study. A 360 degree approach in which  
627 feedback is sought from clinical teaching staff and other stakeholders could be an improvement  
628 on this limitation. Third, we acknowledge that the small sample size may limit the applicability  
629 of our findings to a wider context. However, the study participants are representative of the  
630 total cohort in terms of demographics and we believe these participants allow us to draw  
631 appropriate conclusions. Finally, the study was conducted at a single institution and the results  
632 may not be generalisable to other settings.

633 **Conclusion**

634 The current study sought to explore dental students' experiences about their transitioning from  
635 pre-clinical to clinical training. The results indicate that transition into clinical training can be  
636 complex. Students' inherent characteristics such as positivity, resilience and self-regulation,  
637 and behaviour for seeking role clarification and feedback are essential to facilitate a smooth  
638 transition. An organisation's effort to provide formal orientation, easy socialisation and  
639 acceptance were also necessary. These factors allowed students to adjust well to the required  
640 team dynamics, workload, support network and effective communication. Improved internal  
641 motivation, personal and professional development, commitment and satisfaction were seen as  
642 the positive outcomes of the transition process.

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754 **Tables**

755 **Table 1:** Demographics characteristics of survey respondents (N = 48)

756

	<b>Frequency</b>	<b>Percentage</b>
<b>Gender</b>		
Male	14	29.2
Female	34	70.8
<b>Enrolment status</b>		
Domestic	40	83.3
International	7	14.6
Missing	1	2.1
<b>Age</b>		
19 - 29	41	85.4
≥ 30 years	3	6.25
Missing	4	8.4
<b>Prior Health Experience</b>		
Yes	6	12.5
No	42	87.5
<b>Health Professionals in Family</b>		
Yes	30	62.5
No	18	37.5
<b>First in the family to attend university</b>		
Yes	2	4.2
No	46	95.8
<b>Rurality</b>		
Major city	26	54.2
Regional Centre	17	35.4
Remote Community	4	8.4
Missing	1	2.1

757

758 **Table 2:** Participants' mean scores for the five assessed domains

Statement	Mean	SD	Agree (%)	Neutral (%)	Disagree (%)
<b>Domain 1: Transition and Professional Socialisation</b>	<b>3.52</b>	<b>0.97</b>			
The Clinical Dentistry/Orientation should be provided to all new dentistry students	4.5	0.7	91.7	8.3	0
I was nervous at the beginning of the clinical placements	4.2	1	83.3	8.3	8.4
My first semester of clinical work proved to be better than I expected	4	0.9	85.4	8.3	6.3
Collaboration with my fellow student dentists was easy	4	0.8	83.3	10.4	6.3
I needed time to adjust to the new environment	4	0.6	85.4	12.5	2.1
This was the first time I experienced what it is like to work as a dentist	3.9	1.2	70.8	8.3	20.8
I experienced a great deal of stress	3.7	1	58.3	29.2	12.5
I enjoyed the first few weeks	3.6	1.1	60.4	25	14.6
The Clinical Dentistry/Orientation made the transition into clinical study easier	3.6	0.9	58.3	31.3	10.4
The introduction into the clinical work was satisfactory	3.4	0.9	47.9	37.5	14.6
The first few weeks as a student dentist were difficult for me	3.4	1.1	54.2	20.8	25
I experienced an abrupt transition from pre-clinical to clinical training	3.4	1	47.9	27.1	25
The clinical staff provided sufficient support	3.3	1	52.1	25	22.9
The transition from pre-clinical to clinical training went smoothly	3.2	0.9	39.6	41.7	18.8
My uncertainty lasted only a few days	3.2	1.1	47.9	20.8	31.3
I felt ready to begin clinical training	3	1	9.6	25	35.4
I was very uncertain at the beginning of the clinical placements	3	1.1	39.6	25	35.4
I felt well prepared for clinical training	2.9	0.9	27.1	39.6	31.3
I have considered quitting my dentistry degree	2.5	1.3	25	18.8	54.2
<b>Domain 2: Workload</b>	<b>3.52</b>	<b>1.03</b>			
The workload of student dentist on clinical placement is heavy	4.3	0.9	85.4	6.3	8.3
There is a huge difference between my workload before and after the transition into the clinical training	3.8	1.1	64.6	20.8	14.6
So far student clinics have been tiring	3.7	1	62.5	25	12.5
As a dentistry student on clinical placement I have to work very long hours	3.6	1.1	58.3	18.8	22.9
I had difficulty getting used to the work routine	3.4	1.1	54.2	18.8	27.1
As a student dentist on clinical placement I have enough time to study	2.3	1	14.6	18.8	66.7

<b>Domain 3: Patient Contact</b>	<b>3.04</b>	<b>0.95</b>			
The knowledge that I acquire from contact with real patients is easier to retain	4.6	0.6	95.8	4.2	0
Contact with real patients is easy for me	4	0.9	85.4	8.3	6.3
Contact with real patients stimulates me to study	3.6	1.1	58.3	27.1	14.6
My first contact with real patients was during the first semester of third year	3.5	1.4	64.6	0	35.4
I would have liked real patient contact earlier in the curriculum	3.4	1.2	47.9	31.3	20.8
I think patients feel uncomfortable when they are examined by a student	2	0.9	8.3	6.3	85.4
I am afraid to start a conversation with a patient	1.6	0.7	2.1	6.3	91.7
I feel uncomfortable when I examine a patient	1.6	0.8	2.1	6.3	91.7
<b>Domain 4: Knowledge, knowledge application and skills</b>	<b>3.77</b>	<b>0.87</b>			
I am able to do a dental (extra and intraoral) examination	4.5	0.7	97.9	0	2.1
When I do a history and dental (extra and intraoral) examination, the findings are checked by clinical staff	4.5	0.7	95.8	2.1	2.1
I am able to take a history	4.4	0.7	95.8	2.1	2.1
I am able to do a full oral health assessment	4.3	0.8	89.6	8.3	2.1
I felt well prepared with respect to communication skills	4.1	1	75	16.7	8.3
I am able to apply my knowledge in practice	4	0.8	83.3	12.5	4.2
In clinical practice other aspects of knowledge are important than during pre-clinical training	4	0.8	72.9	22.9	4.2
I feel confident about the findings from history and dental (extra and intraoral) examination	3.8	0.8	77.1	16.7	6.3
The knowledge I acquired during the pre-clinical phase is relevant for the clinical phase	3.8	0.9	66.7	27.1	6.3
There are gaps in my knowledge	3.8	0.9	68.8	20.8	10.4
I have sufficient basic science knowledge	3.7	0.9	62.5	29.2	8.3
I felt well prepared to perform clinical skills	3.7	0.9	60.4	33.3	6.3
The knowledge required in clinical practice is different from my theoretical knowledge	3.6	1	58.3	29.2	12.5
I have sufficient clinical science knowledge	3.6	0.9	58.3	31.3	10.4
I have sufficient behavioural science knowledge	3.6	1.1	50	35.4	14.6
I have the appropriate knowledge readily available	3.5	0.8	52.1	41.7	6.3
The level of my knowledge is sufficient	3.2	0.8	37.5	43.8	18.8
I felt well prepared for clinical skill performance	3.2	0.9	41.7	33.3	25
I was sufficiently prepared for the clinical work as regards theoretical knowledge	3.1	0.9	35.4	39.6	25
I have difficulty recognising pathological symptoms	3	1	37.5	29.2	33.3
<b>Domain 5: Learning and Education</b>	<b>3.81</b>	<b>0.90</b>			

You can learn a lot from chairside teaching	4.6	0.5	100	0	0
The knowledge I acquire in clinical practice is easier to remember	4.5	0.6	93.8	6.3	0
I am able to study independently	4.3	0.8	93.8	0	6.3
What I study is influenced by the assessment programme	4.3	0.9	87.5	8.3	4.2
It is easy for me to obtain experiences from which I can learn	4.2	0.8	85.4	12.5	2.1
I study in a different way than during my first year in dental school	4.2	1	79.2	8.3	12.5
Junior staffs are good teachers	4.2	1	83.3	10.4	6.3
Senior staffs are good teachers	4.1	0.9	81.3	14.6	4.2
I study to learn the things that I want to know	4	0.9	72.9	18.8	8.3
In clinical practice I study in a different way	4	0.8	75	20.8	4.2
I am able to judge my own progress	3.9	0.7	75	22.9	21
I study primarily to pass tests and examinations	3.8	0.9	70.8	16.7	12.5
What I study depends on the problems I have encountered that day	3.8	0.9	66.7	22.9	10.4
The first year in dental school were relevant for clinical practice	3.7	0.9	37.5	37.5	25
Problem Based Learning (PBL) provided good preparation for clinical practice	3.7	0.9	56.3	37.5	4.2
I study more intensively than before the commencement of student clinics	3.6	1.2	60.4	16.7	22.9
My learning is driven by questions from clinical staff	3.5	0.9	52.1	31.3	14.6
I learned a lot from simulated patient contacts	3.4	1.1	52.1	31.3	16.7
I need to study because I have forgotten a good deal of my theoretical knowledge	3.4	1	47.9	29.2	22.9
Simulated patient clinics were good preparation for contact with real patients	3.2	1.1	43.8	29.2	27.1
I learned a lot from the Clinically Oriented Active Learning Sessions (COALS)	2.8	1	22.9	43.8	33.3
Clinically Oriented Active Learning Sessions (COALS) were good preparation for the clinical work	2.7	1.1	22.9	37.5	39.6

A = Agree; N = Neutral; D = Disagree

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760 **Figure Legends**

761 **Figure 1:** Summary of findings based on the concept of organizational socialisation model.

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763 **Declarations**

764 *Conflict of interest*

765 The authors declare no conflicts of interest.

766 *Data availability*

767 All data produced by this study are reported herein.

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