Developing time management skills of undergraduate students undertaking second- and third-year level dental clinical-based training

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Background. Developing time management skills is an essential yet under-reported aspect of dental undergraduate training. Additionally, there is a paucity of studies that have examined how time management skills developed in undergraduate dental curricula.

Objectives. A targeted curricula review was conducted to identify expressions of time management across the theoretical, preclinical and clinical aspects of the training programmes. In addition, the study compared the extent to which second- and third-year students developed their clinical time management skills.

Methods. A combination of qualitative and quantitative data was used. Phase 1 included a document analysis using a data extraction sheet to capture curricular documents comprising 25 dental therapy and 25 oral hygiene modules. Data were analysed using content analysis. Phase 2 included a self-administered questionnaire to collect data from the identified students (N=90). Both closed and open-ended questions were included. Inferential and descriptive statistics and thematic analysis were used to analyse the data.

Results. Phase 1: Two themes emerged from the curriculum review. Explicit statements on time management were in one first-year module, i.e. Academic Skills and Clinical Practice. This module included statements on time management skills and educating students on how to be productive in managing their time at university. Implicit statements on time management were in modules named Clinical Practice in Prevention 1 and 2, and Clinical Practice in Oral Hygiene 1 and 2. These modules indicated that students' time management skills were required for patient management and complete clinical portfolios. Phase 2: The 3rd-year cohort developed higher time management scores (mean 2.91) than the 2nd-year (mean 2.81), signifying a statistically significant relationship (p=0.049). Two major themes emerged from the analysis of the open-ended questions. Participants expressed that time management enabled them to plan, prepare and be punctual and organised to accomplish their clinical tasks. Participants identified the following factors: knowledge of clinical procedures, students' commitment to learning, patient consultation form, punctuality and cooperation of patients, and the waiting period to use radiographic equipment.

Conclusion. Students' time management skills appear to be developed implicitly in the curricula and mainly through clinical training exposure. Curriculum developers can ensure that time management skills are explicitly expressed in all levels of undergraduate curricula. This would encourage students to consciously develop and apply such skills as part of preclinical and clinical training.

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Studies examining students' time management skills denote the integration of developing time management within the undergraduate curricula in health professions education.[1-3] Time management is associated with completing tasks through goal-setting, organisation and self-management skills.[4-7] However, it is unclear how time management skills are developed or measured in dental undergraduate training. Therefore this remains a largely under-researched area in dental training, yet there could be investments in understanding how students develop specific time management skills related to dental clinical training.[8-11] It is with this purpose that a case study approach was used to explore the extent to which undergraduate dental therapy and oral hygiene students developed time management skills in clinical-based training. Apart from undergraduate dentistry training, two major undergraduate dental training programmes (mainly dental therapy and oral hygiene) are also offered at specific higher education institutions in South Africa. Dental therapists and oral hygienists are registered professionals working alongside dentists to identify, prevent and treat oral and dental-related conditions relevant to their scope of practice.[13-15] Graduates are employed in private or public sectors and can practice independently.

From a training perspective, these undergraduate programmes are generally offered over a three-year period. Likewise, the Bachelor of Dental Therapy and the Bachelor of Oral Hygiene programmes offered at this institution are modularised and completed over six semesters. Both programmes comprise 384 credits, respectively, and the exit level modules are pegged at NQF (National Qualifications Framework) Level 7. The programmes are accredited by the Board of Dental Assisting, Dental Therapy and Oral Hygiene within the Health Professions Council of South Africa and the Council for Higher Education in South Africa.[14] Curricula for these training programmes at this institution follow a competency-based framework underpinned by multiple pedagogies such as interactive and cooperation, constructivist, case-based, experiential, peer-paired teaching, and learning.[10,19,21] These pedagogical approaches provide students with unique opportunities to enhance their knowledge, understanding and skill development, contributing to academic and

professional growth. While these are two distinct programmes, both programmes share a common first year of study. This means dental therapy and oral hygiene students register for the same modules in Level 1 of the respective programmes.

In Level 2, there is a divergence in the programmes. However, dental therapy and oral hygiene students use the same clinical space for clinical training. Clinical training comprises 2-hour hands-on sessions for students to work directly on patients under the preceptorship of licensed clinical supervisors. Clinical tasks include, but are not limited to, history taking and examination of the patient's medical and dental status, using diagnostic aids, formulating a diagnosis and treatment plan according to the scope of practice and rendering the relevant dental procedure to manage the patient's condition. However, as indicated earlier, the purpose of this study was to look at how time management skills are developed, irrespective of the clinical procedure performed by students in the second and third levels of study. To achieve this, the study aimed to conduct a targeted curricula review to identify expressions of time management across the training programmes' theoretical, preclinical and clinical aspects. In addition, the study compared the extent to which second- and third-year students developed their clinical time management skills at a higher education institution (HEI).

Methods

Study design

A combination of qualitative and quantitative data was used. This approach allowed for an in-depth exploration of how students developed time management skills in the classroom to transition to the clinical training environment. Phase 1 comprised a document review using a qualitative approach analysis to locate the time management skills developed in the undergraduate dental therapy and oral hygiene curricula. Phase 2 comprised a descriptive comparative quantitative study design using a self-administered questionnaire to collect open- and closed-ended responses on students' engagement in developing time management skills in the clinical setting.

Study site

The study was conducted at an HEI in KwaZulu-Natal Province.

Study participants

Phase 1: Document selection. The dental therapy and oral hygiene curricula guides, templates and descriptors from 2012 - 2024 were selected. Inclusion criteria included all modules underpinned across Levels 1, 2 and 3 of both training programmes. The Health and Illness Behaviour module could not be accessed and was excluded. After retrieving 25 dental therapy and 25 oral hygiene modules, the researcher scrutinised the documents based on Flick's criteria,[26] as outlined in Fig. 1.

Phase 2: Student population. The target population (N=90) was selected as it comprised a whole school population of second- and third-year dental therapy and oral hygiene students registered for the two training programmes. However, participation in the study was voluntary. Owing to the similarity in the clinical setting, the cohorts were compared according to the year of study and not the training programmes. First-year students were excluded as they do not work with patients and are based in the preclinical setting.

Study tools

Phase 1: An electronic data extraction sheet in Microsoft Word was created. A table was used to capture each level of study with modules taken per semester. Columns were labelled with the module name, the nature of the module, the inclusion of time management training/teaching, expected time management skills during clinical sessions, the overall emphasis on time management within the module, and additional comments.

Phase 2: A self-administered questionnaire comprising 34 questions to elicit data collection was designed. Section A included five questions that gathered students' demographics. Section B adopted the ATMS (Assessment of Time Management Skills) 2.0.[16] This included 27 closed-ended statements that covered students' development with time management, organisation planning, and regulation of emotion in the clinic. Both verbal

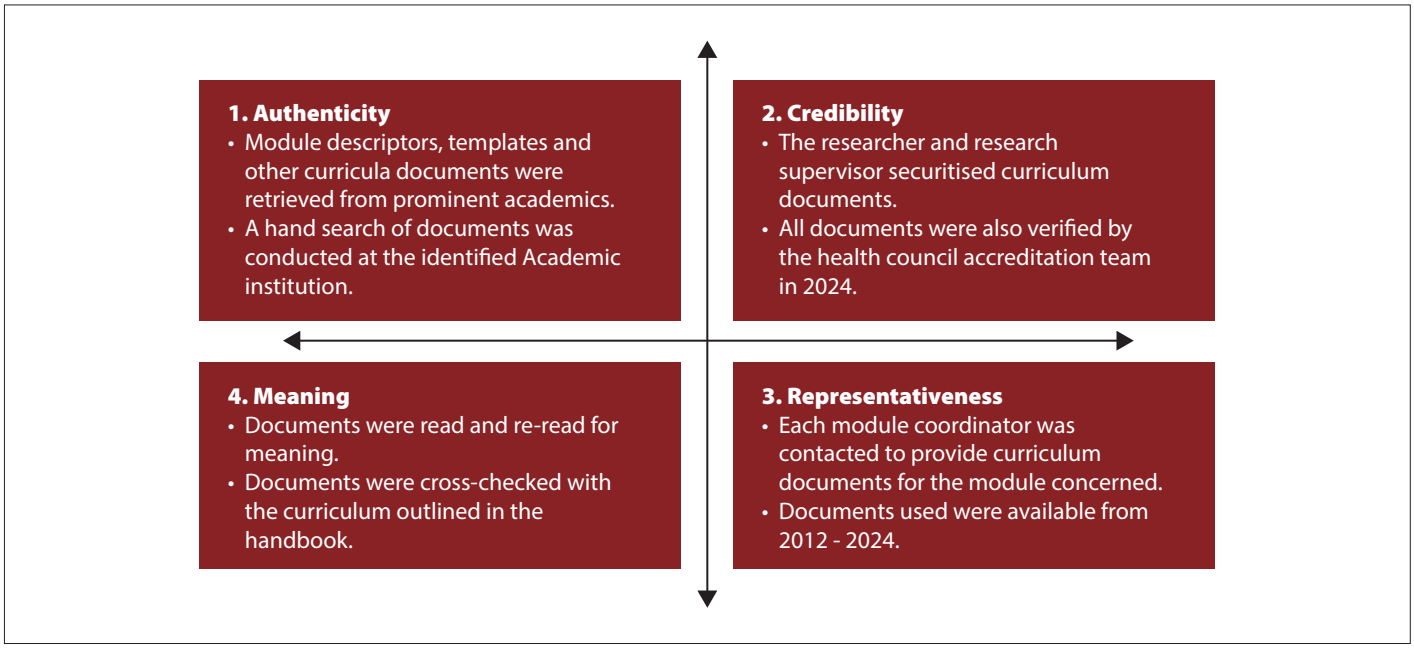

Fig. 1. Flick's criteria to select documents.

and written permission was obtained from the author to use the validated instrument. The statements were linked to a 4-point response scale: 1 = none of the time (<5%), 2 = some of the time (40%), 3 = most of the time (85%) or 4 = all of the time (95%), and reverse scored according to the author's instructions. Section C included two questions focused on students' preparedness and self-assessment of time management skills through open-ended questions.

Data collection

A meeting was scheduled with site management to access study documents, including participants, according to the phases discussed:

Phase 1: All retrieved module descriptors and templates were thoroughly read several times. Explicit statements on time management skills were examined under each module scope, learning content and topics, notional hours, formative and summative assessments, teaching and learning philosophies, learning outcomes, and quality assurance indicators. For example, statements on time management, including planning and setting realistic goals, were expressed in a module entitled DENT 110. A data extraction sheet was used to capture the required data. All data were double-checked for accuracy. The researcher repeated the review process after eight weeks to ensure that no statements on time management were overlooked in the initial review process. This interval allowed the researcher time to review and reflect on the process and to correct any errors in the data extraction phase, which contributed to minimising possible data bias. The research supervisor checked the data entries; thus, the reliability of the data was enhanced through active supervision and verification.

Phase 2: A pilot study was conducted on other allied health sciences students (n=9) to provide feedback on the study tool. The data gathered were excluded from the main study. The instrument was unaltered due to no concerns raised by these participants. The primary study's data collection commenced at the end of the first semester's examinations to avoid disrupting the academic programmes. Field assistants were involved in the debriefing, distributing and collecting of data. Students were given the last two weeks in June 2024 once voluntary informed consent was sought to complete their questionnaires and insert them in designated boxes. The raw data were cleaned, counted and assigned with a code name. All captured entries were cross-checked by an independent checker who validated the data management for analysis.

Data analysis

Phase 1: The data were cleaned and prepared for content analysis. Following a perusal of several readings, the data were segmented to reduce its volume while retaining its core meaning. An inductive approach facilitated the open coding of the condensed units. Manifest codes reflected a literal sense of the data, while latent codes provided a more profound interpretation. The codes were categorised according to the context of the content. Categories were then formulated into themes. This process was repeated to refine themes forming the hermeneutic circle. The steps were repeated to ensure consistency and reliability.

Phase 2: The closed-ended dataset was analysed using the Statistical Package for the Social Sciences (SPSS) version 28. Descriptive and inferential statistical analyses were applied and reported on the data. Descriptive statistics were used to describe the student demographic data and summarised the score values using measures of central tendency. Inferential statistics were applied using two significance tests. An Independent t-test was performed to compare the mean scores between the 2nd- and 3rd-year cohorts. The chi-squared test was conducted to assess the relationship between the level of study and the dependent variables. The independent variables included degree programmes, gender and level of study. The dependent variables included time management, organisation planning, and emotion regulation. A value of $p<0.05$ was established as statistically significant. The assumptions about the data included frequency counts, independent variables were mutually exclusive, a large sample size was used, and similar variance in the cohorts compared. These assumptions were checked against the measures of central tendency, where the standard deviation was critical in deciding the spread of the dataset. The open-ended data were analysed using thematic analysis. Several readings were performed to code each piece of the dataset inductively. This iterative process was repeated five times. Emergent patterns formed themes that were later refined into overarching themes and subthemes to provide answers to the open-ended questions.

Ethical considerations

The study was granted ethical approval by the Biomedical Research Ethics Committee (BREC) of the University of KwaZulu-Natal (ref. no. BREC/00006495/2023) and the Health Research and Knowledge Management of the KwaZulu-Natal Department of Health (ref. no. KZ_202312_031). Gatekeeper permission was authorised from the study site. Participants participated voluntarily in the study. Informed consent was obtained from all students interested in the study before study participation. Participants were made aware that they could withdraw from the study at any given point without any negative consequences. The researcher set up meetings with the field assistants, and the aim and objectives of the study, as well as the data collection process, were explained in detail. The researcher also outlined the ethical considerations that had to be considered, such as informed consent and maintaining participants' dignity, privacy and confidentiality. Field assistants were allowed to ask questions and seek clarifications. The researcher was also available on-site to address any challenges or provide further clarity. As the main researcher was a clinical supervisor, these research assistants were used in data collection to avoid participant bias or over-reporting. Data management was maintained at the site and security protected before conversion to electronic means, upon which it was password protected. Participant responses were encrypted with a unique code to maintain anonymity; for example, the code SMJ52 denoted a student.

Trustworthiness of qualitative data

Expertise and feedback gathered from the research supervisor ensured confirmability. Dependability was confirmed by detailing the steps taken in conducting the research. Findings are presented so that the reader can assess the similarity of characteristics to their setting, ensuring transferability. All analysed data were cross-checked by the statistician and verified by the research supervisor, who assured the credibility of the findings. Reflexivity was maintained through note-taking.

Validity of quantitative data

The use of open- and closed-ended questions, a previously validated research tool, guidance from the author in the field of time management, and a large student population contributed to the internal and external validity of the study.

Results

This section reports the findings of the analysed data collected in the two study phases. For phase 1, the results are presented with an analysis of curricula review in the undergraduate dental therapy and oral hygiene programmes. Two themes emerged from the document analysis: inconsistent expressions of time management skills in the curriculum; and implicit reference to developing time management skills in patient care. The results for the closed-ended responses describe the reported skills developed in time management. The following themes emerged from the analysis of the open-ended questions: the impact of time management on students' clinical sessions and factors influencing students' clinical time management. The qualitative themes provided a broader understanding of where and how time management skills are located within the undergraduate training programmes. This refers to the theoretical teaching of time management, which is implicitly developed. The quantitative findings measure and compare the extent to which time management skills were explicitly developed during clinical-based training. This linkage between the qualitative themes and quantitative findings demonstrates how theoretical skills translated into practical application to build sound clinical skills and deliver patient-centred care.

Phase 1: Document analysis

The development of students' time management skills was explicitly expressed in the DENT 110: Academic Skills and Clinical Practice module in Level 1 of the standard curricula. Expressions on time management skills were noticeably absent in other module templates and descriptors in Levels 2 and 3, (Supplementary Table 1; http://coding.samedical.org/file/2346). The notional learning hours specified for practical, preclinical and clinical components of the curricula lacked description when scrutinised on student preparedness between supervisors and patients; breakdown of time within sessions; prioritisation of treatment plans and procedures; estimation of time required per procedure; and guidelines on time management for clinical supervisors, needed to articulate in developing a level of competence. Two themes emerged from the analysis: Themes A and B.

The qualitative themes below describe the skills in time management theoretically taught in Level 1 of the curricula that students develop implicitly. These skills are then required for students to manage their time on treating patients in the clinical setting and completing clinical portfolios, as described in Theme B.

Theme A: Inconsistent expressions of time management skills in the curriculum

The learning objectives and outcomes in the standard module (DENT 110: Academic Skills and Clinical Practice) contained explicit expressions on time management skills. Through classroom interactions, students learn how to formulate and set reasonable goals that can be achieved by being productive in their planned tasks. This is further made possible through prioritising tasks using timetables and diaries as reminders to monitor their time and meet deadlines. The module highlighted that time management skills would allow students to expand their chances of improving their scholarly performance after effectively controlling their time and balancing efforts between study and leisure activities.

Theme B: Implicit reference to developing time management skills in patient care

The teaching and learning philosophy exhibited in the clinical modules (Clinical Practice in Prevention 1: DENT 343 and Clinical Practice in Prevention 2: DENT 346) outlined the use of time management skills required for students to develop during patient treatment during clinical sessions. In contrast, other clinical modules (Clinical Practice in Oral Hygiene 1: DENT 349 and Clinical Practice in Oral Hygiene 2: DENT 345) noted that students should use time management skills when producing clinical portfolios on patient management.

Table 1. The extent to which students developed skills in time management during clinical training

	Scales									
	None of the time		Some of the time		Most of the time		All of the time			
Skills	2nd *n* (%)	3rd	2nd *n* (%)	3rd	2nd *n* (%)	3rd	2nd *n* (%)	3rd	Chi-square value	*p*-value
I feel I manage my time well.	1 (1.1)	4 (4.4)	32 (35.6)	14 (15.6)	13 (14.4)	18 (20)	4 (4.4)	4 (4.4)	8.646	0.034
I can correctly estimate the time I need to complete my tasks.	7 (7.8)	3 (3.3)	24 (26.7)	14 (15.6)	16 (17.8)	16 (17.8)	3 (3.3)	7 (7.8)	4.779	0.189
I learn from my mistakes.	0 (0)	0 (0)	9 (10.1)	2 (2.2)	14 (15.7)	9 (10.1)	27 (30.3)	28 (31.5)	4.265	0.119
I feel confident that I can complete my daily routine.	3 (3.3)	1 (1.1)	10 (11.1)	9 (10)	27 (30)	13 (14.4)	10 (11.1)	17 (18.9)	6.740	0.041
I carry an appointment book.	22 (25.3)	21 (24.1)	11 (12.6)	13 (14.9)	6 (6.9)	2 (2.3)	10 (11.5)	2 (2.3)	6.232	0.101
I make to-do lists.	9 (10)	11 (12.2)	19 (21.1)	16 (17.8)	10 (11.1)	8 (8.9)	12 (13.3)	5 (5.6)	2.481	0.479
I wait until I feel better before taking on important tasks.	10 (11.1)	15 (16.7)	14 (15.6)	13 (14.4)	19 (21.1)	9 (10)	7 (7.8)	3 (3.3)	5.961	0.048
I look at a watch or a cell phone to keep track of the time.	2 (2.2)	2 (2.2)	15 (16.7)	4 (4.4)	10 (11.1)	10 (11.1)	23 (25.6)	24 (26.7)	5.345	0.148
I reward myself for doing a good job.	7 (7.8)	7 (7.8)	16 (17.8)	12 (13.3)	16 (17.8)	9 (10)	11 (12.2)	12 (13.3)	1.482	0.042
I feel competent about managing my time when I write down my appointments.	4 (4.4)	4 (4.4)	18 (20)	13 (14.4)	21 (23.3)	14 (15.6)	7 (7.8)	9 (10)	1.362	0.714
My mood affects my ability to manage my time.	11 (12.2)	14 (15.6)	18 (20)	16 (17.8)	12 (13.3)	3 (3.3)	9 (10)	7 (7.8)	5.079	0.061

Phase 2: Self-administered questionnaire: Analysis of closed-ended questions

Participants' demographic information

Ninety undergraduate students completed the self-administered questionnaire, which yielded a response rate of 100%. More than half of the study participants (55.6%, *n*=50) were in their 2nd year, and the remaining (44.4%, *n*=40) were in their 3rd year. About two-thirds of study participants were female (67.8%, *n*=61), and the remaining third were male (32.2%, *n*=29). More than half of the students (55.6%, *n*=50) pursued dental therapy, while the rest pursued oral hygiene (44.4%, *n*=40).

Time management skills developed in clinical training

The findings below compare the time management skills developed between the 2nd- and 3rd-year cohorts according to the three subscales. The text is linked to the cross-tabulation of numeric analyses (Table 1). A significant association was found in the overall time management skills in the mean scores between 2nd- and 3rd-year cohorts (Supplementary Table 2; http://coding.samedical.org/file/2346).

Time management

About 35.6% of the 2nd-years (*n*=32) indicated that they could manage their time well in the clinic (some of the time), whereas 20% of the 3rd-years (*n*=18) stated that they managed their time well (most of the time) (*p*=0.034). Most of the 2nd-years (*n*=27, 30.3%) and 3rd-years (*n*=28, 31.5%) revealed that they learnt from their mistakes. About half of the 2nd-years (*n*=24, 26.7%) could correctly estimate the time needed to complete tasks (some of the time), whereas less than half of the 3rd-years (*n*=16, 17.8%) indicated (most of the time) (Table 2).

Organisation planning

About 51.2% of 2nd-years (*n*=22) and 48.8% of 3rd-years (*n*=21) mentioned that they did not carry an appointment book for clinical sessions. Less than half of the 2nd-years (*n*=19, 21.1%) and the 3rd-years (*n*=16, 17.8%) made to-do lists some of the time. About 21.1% of 2nd-years (*n*=19) waited to feel better before taking on essential tasks, while 16.7% of 3rd-years (*n*=15) did not wait to feel better before taking on essential tasks (*p*=0.048). Many of the 2nd-years (*n*=23, 25.6%) and 3rd-years (*n*=24, 26.7%) used a watch or phone device to keep track of their time (Table 2).

Regulation of emotion

Nearly 17.8% of 2nd-years (*n*=16) and 13.3% of 3rd-years (*n*=12) rewarded themselves for doing a good job (*p*=0.042). Less than half of 2nd-years (*n*=18, 20%) and 3rd-years (*n*=16, 17.8%) mentioned that their mood affected their ability to manage their time. Similarly, 23.3% of 2nd-years (*n*=21) and 15.6% of 3rd-years (*n*=14) felt competent about managing their time when they wrote down their appointments (Table 2).

Analysis of the open-ended questions

The qualitative themes refer to students' perceptions of engaging in time management skills in clinical training. Two themes emerged from the analysis, with subthemes describing participants' self-assessment of time management skills developed in response to working with dental patients in the clinical setting.

Theme 1: The impact of time management on students' clinical sessions

Participants stated that time management enabled them to plan, prepare and be punctual and organised to accomplish their clinical tasks and procedures within 2 hours. This practice positively influences their psychosocial well-being linked to working timeously to deliver their patient's needs. Three subthemes are presented in Table 2.

Theme 2: Factors influencing students' clinical time management

Participants identified several factors that implicate their time management in the clinical setting. Similar experiences were noted among both cohorts drawn from the training environment, including support systems responsible for the operation of student-centred clinical training. Five subthemes are presented in Supplementary Table 3 (http://coding.samedical.org/file/2346).

Discussion

This section discusses the qualitative and quantitative findings of the current study. Owing to the lack of literature on students' clinical time management skills, results were compared with other published studies that examined time management skills in higher education developed in academic settings (non-clinical).

The document analysis indicated that students began developing time management skills early, starting in their first year, to effectively navigate their academic workload and ease their transition from high school to higher education. This approach contrasts with the study by Mukwevho,[17] who found an absence of teaching time management to first-year students. The themes of the document analysis articulated the open-ended questions, where participants ascribed using time management in planning and preparing to assist them with being organised for sessions, which positively influenced their psychosocial health. Likewise, as a thematic finding, it was also found that planning and preparation helped second-year dental students organise their time through a preclinical time management exercise.[18] On the other hand, these associations were refuted owing to the lack of

Table 2. How time management assists students during clinical sessions

Subthemes	Participant quotations
2.1 Being productive in a clinical session	Around 50.7% of 35 participants expressed that managing their time made them efficient in their tasks. 'It helps me from becoming overwhelmed in the clinic and ensures that I have enough energy in order to do my tasks to the best of my ability.' (SMJ52)
2.2 Students' clinical organisation and preparedness	Approximately 15.9% of 11 participants mentioned that time management helped them to be organised and prepared for their clinical sessions by reading their notes before coming for clinical sessions. 'It makes my life organised [by] making sure that I start my session on time and dismiss the patient on time.' (SMH35) 'It helps me to be ready and to go over my work for the following day.' (SMF64)
2.3 Arrive on time	About 7.2% of 5 participants stated that keeping track of their time allowed them to be punctual for clinics. 'It assists me to be in the clinic on time and I don't let my patient wait for me.' (SME90)

statistical significance in the quantitative categories of organisation planning and regulation of emotions. Considering the challenges that students reported influencing their clinical time management, these confounding results underscore the gradual learning in the first semester when data were collected. Through this lens, these results do not compromise the study's outcome, which further points to a gap in teaching.

Curricula content examined across Levels 2 and 3 of both training programmes indicated a lack of focus on teaching and learning time management skills. There appears to be an assumption by curriculum developers that an expressed curriculum should focus on the learning outcomes that collectively will contribute to building graduate competencies. Therefore, the focus is more on building knowledge acquisition and developing skills congruent with the scope of practice. The value of identifying and developing time management is seen as being more embedded in clinical training, as opposed to actively discussed and interrogated in both the classroom and clinical settings. This view points to a noted gap in curriculum development because the implicit development of such skills would mean that student learning and exposure are not uniform. Such learning would depend on the clinical supervisor, the type of patient seen and the personal and organisational skills of the student, which can create gaps and missed opportunities in the student learning experience. This hiatus calls for a closer examination of how the other attributes of student clinical learning are achieved and are not just a focus on clinical knowledge and skills.

While some modules emphasised the paramount value of time management required for patient management, this may comprise surface evidence to rationalise the recommendations of including time management in formalised teaching in training programmes.[1-3,8] In managing clinical workloads requiring time management skills within the diversity of clinical-based training, the social learning theory could explain how skills may be further developed when students interact, learn and emulate the behaviours of their peers and supervisors to accelerate their skill development in the clinic.[19-21] As such, students' willingness, as highlighted in subtheme 5.2 (Students' commitment to learning in the clinic), may be considered critical to help understand their initiatives to learn and grow their clinical competency. Similarly, other authors reported that contextual influences in educational environments influence students' learning and affect their motivation and time management.[8,12]

Similarly, about 21.1% of 2nd-years (n=19) waited to feel better before taking on important tasks, while 16.7% of 3rd-years (n=15) did not wait to feel better before taking on important tasks. This finding, however, contradicts the notion of students taking an active role in their learning process, which does not align with the constructs of competency-based curricula.[13,21,25] This further indicates that time management skills are not developed quickly, but that relatively constant practice enables gradual development.[22] Meanwhile, it was found that less than half of the 2nd-years (n=19, 21.1%) and the 3rd-years (n=16, 17.8%) made to-do lists some of the time. In contrast, another study found that 48.6% of participants (2nd- and 3rd-year medical students) made to-do lists daily.[24] This finding contrasts with subtheme 4.2 (Students' clinical organisation and preparedness). Overall, the time management scale indicated that the 3rd-year cohort exhibited higher time management than the 2nd-year cohort. This explanation accompanies the notion that developing time management skills is not linear. Still, an interplay of exposure and experience over time could enhance self-improvement in time management skills.[18,22,23,25] Conversely, this implies that year students must be more practically engaged with curriculum content to manage their time in the clinic better.[20]

According to another investigation, approximately 45.3% of participants could correctly assign specific time around course tasks (always).[1] Contrary to this finding, the current study found that 26.7% of 2nd-years (n=24) could correctly estimate the time needed to complete tasks (some of the time), whereas 17.8% of the 3rd-years (n=16) indicated most of the time. This accounts for the transition that students experience when they exit preclinical simulation to work in the clinical setting. This evidence is triangulated with subtheme 5.1 (Familiarity with a procedure saves time), where participants illustrated that sufficient knowledge and experience in performing a particular procedure is considered a time saver. Clinical sessions were noted as two hours for students to perform various clinical tasks where clear guidelines on managing time still needed to be included. This could connect time management skills to advance patient care in the clinic.[18] While the study did not report statistical significance in the following critical areas: My mood affects my ability to manage my time (p=0.061); I feel competent about managing my time when I write down my appointments (p=0.714); I learn from my mistakes (p=0.119); I look at a watch or a cell phone to keep track of the time (p=0.148), these findings should not be ignored; they imply that students need to be actively engaging in developing and monitoring time management skills to meet their learning objectives and improve their overall competency.

Similarly, these findings align with the themes of the open-ended questions, which indicated students' developed time management skills, enabling them to be productive in their clinical sessions, which had a positive bearing on their psychosocial health. This supports the notion of active learning, where students are the agents that drive their learning process. Moreover, the emergent themes from the curriculum review align with these quantitative findings, where it can be inferred that the theoretical aspects of time management in the expressed curriculum do not necessarily translate to skills in the clinical environment. A paradigm shift in understanding the complexity of skill development in the clinical environment is needed. This integration of findings, therefore, illuminates the need for a student-centred approach that considers all learning aspects and not just a focus on the scope of practice. Therefore, it is re-emphasised that time management skills are not as quickly developed as theoretically taught in the curricula. This requires more meaningful engagement from students to continue refining their clinical skills, aided by better organisation, planning and taking control of their emotions in managing their time in patient-centred care.

Study strengths and limitations

The study used quantitative and qualitative data to examine time management development in undergraduate dental training programmes. This provided insights and a better understanding of time management embedded in the undergraduate dental curricula and its associated translation into clinical practice. Nevertheless, several limitations were noted. The generalisability of results is limited to one HEI. The study population comprised second-year students who had undertaken clinical training and had yet to gain experience working with patients. Therefore, the study findings could be influenced differently, depending on when the data are collected (e.g., semester 1 or 2). Therefore, different responses and interpretations would surface, as time management skills are better developed towards the end of the year. Clinical supervisors' and patients' perspectives on clinical training were not incorporated. These findings could refine the results with

a better understanding of developing time management in dental training programmes.

Study recommendation

Time management skills are crucial for undergraduate dental students in shaping graduate competency of the 21st century. The study recommends incorporating time management training into mainstream dental curricula, with content aligned with the training requirements of clinical-based training. This would provide specific time management tailored to patient-centred care to improve the overall clinical performance of dental students. This may include time management exercises during tutorials, seminars, mentorship programmes and workshops for students to learn, practise and reflect on their time management skills. These results lend implications to real-world settings where other dental and health science schools can use them to improve time management development.

Conclusion

The study findings suggest that students' time management skills appear to be developed implicitly in the curricula and entirely during clinical training. It is noted that time management skills require consistent efforts intertwined with experience and exposure, enabling better student clinical outcomes. These skills assist students by allowing them to be punctual in planning and preparing before, during and after clinical sessions. Hence, learning outcomes in theoretical and clinical modules require alignment to sustain the time management training within competency-based dental curricula.

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