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## RESEARCH ARTICLE

### EXPOSURE OF SENIOR UNDERGRADUATE DENTAL STUDENTS TO VARIOUS CLINICAL PROCEDURES IN COMPREHENSIVE DENTAL TRAINING PROGRAM OF RCSDP

\*<sup>1</sup>Sulaiman Alhawaish, <sup>2</sup> Khalaf Aldawsari, <sup>3</sup>Abdulrahman Mursi, <sup>4</sup> Abdulkhleq AlSalman and <sup>5</sup>Shahzeb Hasan Ansari

<sup>1</sup>General Dentist, Al Zahra PHCC, Unayzah, Saudi Arabia

<sup>2</sup>General Dentist, AlMuhaideb Medical Group, Riyadh, Saudi Arabia

<sup>3</sup>General Dentist, AlQabliya PHCC, Umluj, Saudi Arabia

<sup>4</sup>General Dentist, Psychiatric hospital, Hail city, Saudi Arabia

<sup>5</sup>Lecturer Preventive Dentistry, Riyadh Colleges of Dentistry and Pharmacy, Saudi Arabia

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#### ABSTRACT

**Introduction:** Dental schools believe that repetition is the key for competence in clinical procedures, and this believe is based on two concepts, 1) student learn from experience 2) practice and repetition is more important than the quality of performance.

**Materials and Methods:** Survey based research was conducted in Riyadh Colleges of Dentistry and Pharmacy in both male as well as female campuses and a total of 304 students from levels 9 – 12 were invited to take part. Data was subjected to statistical analysis using SPSS (version 17).

**Results:** 33% of male participants did not have any exposure to complex amalgam restorations as compared to 52% female participants. 50% males felt confident with their exposure to simple root extractions, as compared to 44% of females. This is in contrast to the exposure of 25% males to root separation as compared to only 13% females.

**Conclusion:** There have been evidences of students lacking enough exposure to various clinical procedures. Level 11 and 12 students are lacking exposure to a number of procedures.

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#### INTRODUCTION

Dental schools believe that repetition is the key for competence in clinical procedures, and this believe is based on two concepts, 1) student learn from experience 2) practice and repetition is more important than the quality of performance. In a previous study, it had been shown that after passing standard number of the same procedure, competence standard is met, however, there is not much improvement on the competence after that and the graph starts to plateau. There is no published research that supports an exact number of procedures that should be done to achieve clinical competence, but often this number is set a little below the number of procedures achieved by the average student. Overall, the above mentioned study failed to correlate students' performance with more clinical experience and the numbers of practiced procedures are not an indicator of the performance (Chambers, 2012). Some of the major challenges that face dental education in the US is that dental curriculums are rigid and not student friendly, that with the insufficient funding of dental programs and lack of vision to provide dental care to those with limited

access to financial means will force a major change in the US dental schools. The Ohio State University College of Dentistry in partnership with The robber Wood Johnson Foundation started implementing a community-based education program, in which the student take a 46.5 days rotation in community-based placement. It was noted that majority of the students did not perform several dental procedures more than once or twice compared to other procedures which they performed many times repeatedly (Bean et al., 2007). In general the dental students do not have many options to select the course topics and subject matters like their dental curricula. The Curriculum requirements associated biomedical and clinical knowledge that must be addressed during dental school. However, the variance of educational experiences is found, but the students trying their bests to share their educational experience. The purpose of that research was to elicit the perspectives of dental students. The students were asked to provide their feedback on the quality of the educational program in an open-ended written format. The comments and problems were reviewed and classified to different categories. Some methods were applied like The SWOT method to evaluate the strengths, weaknesses, opportunities and threats .the survey focused on many factors like clinical learning experience and opportunity to work with knowledgeable faculty. However there are different factors that may affect clinical experience of the

\*Corresponding author: Sulaiman Alhawaish  
General Dentist, Al Zahra PHCC, Unayzah, Saudi Arabia

students such as disorganized and inefficient clinical learning environment, teaching and testing that focus on memorization, poor quality instruction characterized by curricular disorganization and inconsistency among instructors during student evaluations. The main objectives are to develop strategies to provide students with more exposure to patients, especially early in the curriculum to learn new technology/techniques. Unfortunately, there are certain threats that may negatively affect students' experience e.g. cost of dental education and questionable treatment of patients in the dental clinic as a consequence of pursuing procedural requirements. In a previous study, analysis of a large volume of student comments elicited by the C-SWOT revealed student perceptions were generally similar among sophomores, seniors, and recent graduates who entered dental residency programs (Henzi *et al.*, 2007).

Dental students find a need to improve their clinical skills and training in several specialties under supervision of clinical instructors. It has been reported that skills that have developed during clinical training depend heavily on the interactions with the faculty. Effective clinical teachers have the attributes of providing specific feedback about performance, demonstrating their interest in teaching, and making the effort to motivate the students. Few of the major problem facing comprehensive clinical dental education in the US are, limited faculty in numbers and difficult accessibility to them, inconsistent feedback and instruction, lack of support resources in the clinics which causes the students to be responsible for administrative tasks, and finally some strategies to meet the procedural requirements are sometimes ethically questionable (Henzi *et al.*, 2006). The undergrad dental educational programs in the greater part of the Indian Dental Schools contains dental procedural and lab aptitudes, these abilities are instructed and learned inside a stipulated time of four years. One of the significant instructing and learning goal of the pre-clinical educational programs is the expertise that is procured in the course of action of manufactured teeth and the ensuing strides in creation of a total denture removable prosthesis. Instructing such, a research center exercise requires that the understudies pick up a conceptual comprehension of the procedure of denture creation (Ahmed & Donna, 2014).

At the point when understudies experience dental preparing, they are presented to a wide assortment of information sources and showing procedures from various sources. The most generally utilized guides are addresses with control point introduction with or without recordings, aggregate talk and live exhibit. The main utilization of PCs as a learning instrument in the dental field was accounted for in the mid seventies when PC Supported Learning (CAL) was created as a piece of dental educational modules at the College of Kentucky. Classroom based addresses are most likely the best showing strategy by and large to communicate reasonable information (William, Steven & Gary, 1990). Addresses supplemented with video and power point introductions are as a rule generally utilized for educating and preparing specialized aptitudes, reenacting clinical circumstances in dentistry. Gathering talk offers space for understudies to create affinity and investigate their questions. Live exhibition is powerful in clarifying the method in a consecutive way, which influences the understudy to play out the ability freely. Live showings and the recorded introductions of the same were observed to be similarly successful in transmitting pre-clinical

information and clinical aptitude for first time students (John, Richard & Anthony, 2017). Mixed learning approach is a blend of at least two showing techniques like e-learning with conventional teacher preparing. At the point when the understudies are presented to such assortment of showing strategies and have an entrance to more than one technique for learning aptitudes, the data has a superior possibility of being comprehended, held and imitated. The goal of the present investigation was to assess the adequacy of three diverse showing systems for course of action of simulated teeth and to assess the perfect request of educating in the improvement of the expertise (Joel *et al.*, 2017).

Conventional addresses and power-point introductions are routinely utilized as methods for transmitting information and aptitudes are learnt by exhibit of system to little gatherings. Instructing prosthodontics to first and second year dental understudies, to make it fascinating and support learning has been a test. Preclinical Prosthodontics in undergrad dental educational modules intends to give hypothetical learning to the understudy and empower them to create aptitudes associated with finish denture manufacture with no patient contact (Frank & Caswell, 2017). It has been accounted for that understudies neglect to review essential logical ideas identified with clinical fields; in this way scrutinizing the adequacy of scholastic training conferred in the underlying years. Moreover, understudies additionally encounter uneasiness amid the change from preclinical to clinical years. It is accordingly prescribed that understudies ought to be acquainted with clinical condition in the early years of their course so they comprehend the significance of preclinical exercise of denture manufacture/substitution of missing teeth and related structures. There is confirm demonstrating that early clinical presentation (ECE) may move training and learning towards the genuine setting of training (Denise Jean, 2015). Early clinical introduction is a "Genuine human contact in a social or clinical setting that upgrades learning of wellbeing, sickness and illness, and the part of the wellbeing proficient." ECE can be actualized in all or any of the three settings: Classroom setting, Healing center setting and Group setting. ECE encourages understudies' change to the clinical stage, causes them create proficient personality, expands their inspiration, makes them mindful of the utilization of fundamental sciences and lift their certainty to deal with their patients' issues practically speaking (Siddiqui, 2017). Viability of ECE in therapeutic training is entrenched, yet there is an absence of information identified with its adequacy in dental instruction, in the Indian setting. Subsequently, this examination was done with a point of testing the adequacy of an ECE (Early Clinical Presentation) module in preclinical prosthodontics on the execution of second year dental understudies. The destinations of the examination were to look at the learning and abilities of second year dental understudies prepared utilizing traditional educational addresses with those prepared with a mix of pedantic addresses and early clinical presentation module and to survey the view of dental understudies in regards to early clinical introduction (Leisner & Matheos, 2006).

#### Aims of the study

- Determine the frequencies of procedures done by the undergraduate dental students.

- Determine the factors behind varying frequencies of procedures.

**MATERIALS AND METHODS**

A closed ended questionnaire was used to determine the repetition and frequency of certain dental procedures. Questions were focused on each dental specialty with the level of satisfaction of students being measured for each procedure done in comprehensive dental care. Procedures representing prevention, periodontics, restorative, endodontics, oral surgery and prosthodontics were included to assess the frequency and possible need of more practice and exposure of dental students in the clinics. Second part of the survey was designed in a way to let the students express their concerns and reasons behind low exposure to certain clinical procedures. Research was conducted in RCsDP in both male as well as female campuses and a total of 304 students from levels 9 - 12 were invited to take part. Data was subjected to statistical analysis using SPSS (version 17). Descriptive statistics were used including frequencies and chi-square test.

**RESULTS**

- 33% of male participants did not have any exposure to complex amalgam restorations as compared to 52% female participants.
- 50% males felt confident with their exposure to simple root extractions, as compared to 44% of females. This is in contrast to the exposure of 25% males to root separation as compared to only 13% females.
- 38% of males students had not experienced the use of cobalt chromium partial dentures as compared to 45% female students.
- Use of cast post and pre fabricated post was uniform between male and female participants.
- 55% of female dental students had no exposure to inlay/onlay as compared to 32% males.
- 50% of the female students had no exposure to pulpectomy procedure as compared to 25% males.
- GPA comparisons were not distinctive when inquired about preventive clinical procedures.
- Regarding periodontal procedures, high GPA students had more exposure recorded as compared to the low GPA students.
- There was no significant difference between high and low GPA students when inquired about amalgam exposure; all students had low exposure.

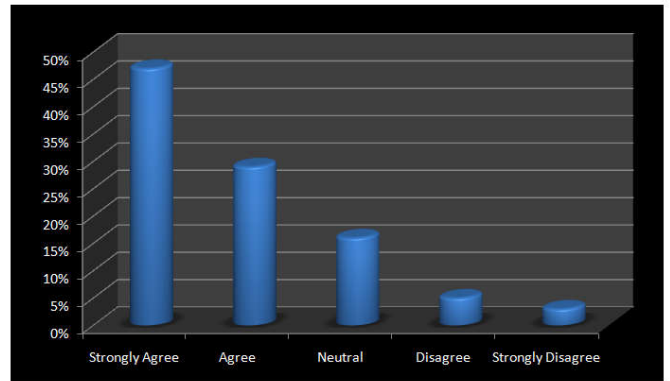
**Table 1. Gender Frequency**

	Frequency	Percentage
Males	120	39.5
Females	184	60.1

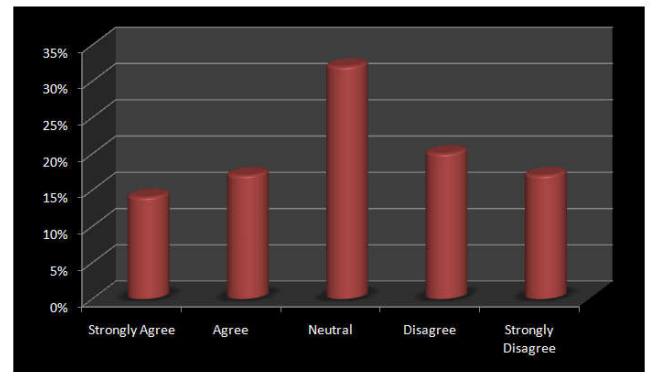
**Table 2. Frequency of participants from various levels**

Level	Frequency	Percentage
9	162	53%
10	52	17%
11	59	19%
12	31	11%

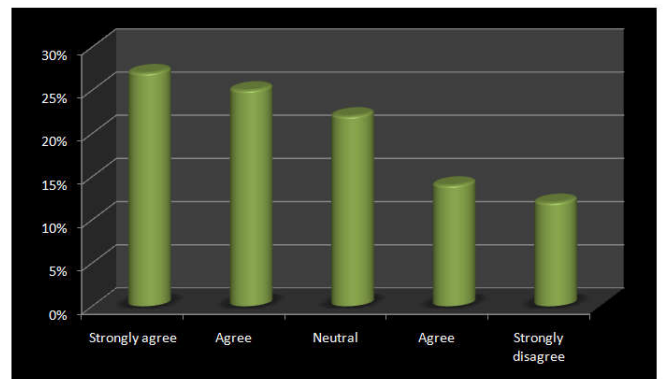
- High GPA students were found to have more exposure to 1-2 canals RCT as compared to low GPA students.
- More than 65% of male and female students revealed that they had been discouraged to perform certain procedures by their clinical instructors.
- More than 50% students reported that they were not trained enough to perform certain procedures.
- More than 70% students found their lack of exposure to various procedures to be associated with patients' commitment.



**Figure 1. Exposure satisfaction to the use of Fissure Sealants**



**Figure 2. Exposure satisfaction to CRT by level 11 students**



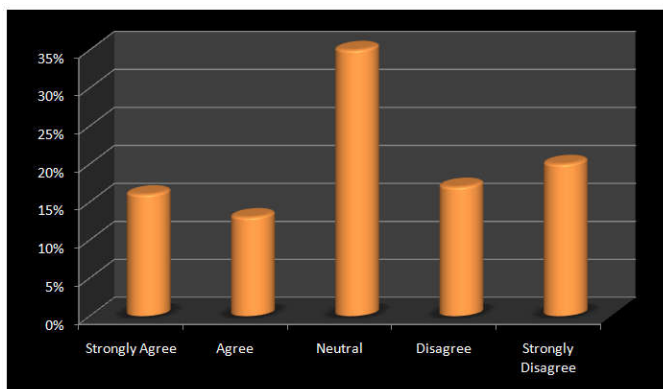
**Figure 3. Exposure satisfaction to scaling for severe local factors among all participants**

**Table 3. Exposure satisfaction of all levels for the use of one surface amalgam**

Level	Str. Agree	Agree	Neutral	Disagree	Str. Disagree
9	6%	14%	16%	17%	48%
10	8%	15%	19%	23%	35%
11	10%	19%	32%	27%	12%
12	16%	19%	32%	16%	16%
Total	8%	16%	21%	20%	35%

**Table 4. Exposure satisfaction of students' with different GPAs for Complex Composite restorations**

GPA	Str. Agree	Agree	Neutral	Disagree	Str. Disagree
Excellent	34%	32%	19%	8%	6%
Very good	24%	40%	22%	7%	8%
Good	31%	39%	15%	12%	3%
Acceptable	8%	17%	42%	17%	17%

**Figure 4. Exposure satisfaction of Level 12 students for RCT 3-4 canals**

## DISCUSSION

This study was focused on different clinical level students in both campuses of RCsDP. The students showed great interest during data collection as it gave them an opportunity to express their weaknesses and factors affecting their low productivity. Level 9 and 10 students reported low exposure to a number of clinical procedures, which is understandable as they are relatively inexperienced in clinics as compared to level 11 and 12 students. It was interesting to see that the higher level students reported lack of exposure to a few important clinical procedures as well. There was a significant difference between male and female students when inquired about their exposures to various clinical procedures. It may be noted that the clinical timings and number of patients flow differs in male and female campuses, therefore affecting the overall productivity. Regarding restorative procedures, it was noted that a large majority of students did not use amalgam at all. They found composite to be more convenient and the patient's choice was kept in consideration as well. Root canal retreatment procedures were not practiced specially by higher level students as lower level students are not encouraged to perform this procedure. Second part of the questionnaire was related to the factors which may affect the overall exposure of dental students to the essential clinical procedures. Factors such as time of clinics, instructor's choice of treatment and difficulty in finding new patients were noticed to have great impact on students' inability to expose to a number of clinical procedures. Advancement of an expertise includes the idea of learning, by which a student enhances execution through training until the point when the right execution of the engine aptitude winds up plainly programmed. It is basic for the understudy to consider the information amid their initial learning stages particularly at the pre-clinical years. Pre-clinical educational programs in entire denture removable prosthodontics include instructing and learning of key research facility and clinical advances.

It includes manufacture of a totally edentulous model over which a trial denture base with occlusal edges to be created. Teeth course of action would be done on this deride show mimicking patient's jaw to perform better on clinical strategies. The understudies are required to play out this aptitude in stipulated timeframe following standard teeth game plan standards, which is assessed toward the finish of their pre-clinical educational programs. Educating any methodology to a first year undergrad understudy with no clinical introduction will just make them a spectator, which thus reflects in getting the hang of, getting a handle on, holding and duplicating the aptitude; consequently, it requires successive accentuation of these systems and resulting assessment of the expertise (Goswami, Karaharju-Suvanto & Kaila, 2017). Learning in little gatherings empowers the understudies to watch the system and learn with greater clearness and connection. It gives a chance to every understudy to take an interest, and interface with the administrator, likewise accuses the understudy of the duty regarding learning and examining themselves through self and associate assessment. In any case, shows to little gathering of understudies are tedious yet they increment the view of trust in dental understudies. This examination included three little gatherings, who were presented to various showing procedures in various requests as portrayed in. The request of instructing indicated distinction in execution among the gatherings and Gathering An understudies who were at first presented to live exhibits performed better toward the finish of first and third teeth game plan work out (Westall & Dickinson, 2017).

Addresses, workshops, perusing assignments and research facility encounters are instructional techniques used to educate new ideas to dental understudies however they miss the mark in educating the specialized parts of clinical methods. Addresses are generally dreary and they neglect to bestow an aptitude, they give just a blueprint of a system. Gathering C understudies, who were presented to addresses in their first teeth game plan had gotten lesser scores when contrasted with different gatherings. Addresses can help understudies to obtain information about essential standards of course of action however the position, arrangement and the mistakes can't be judged. Gathering B understudies who were presented to bunch dialog with hand-outs performed superior to Gathering C however had gotten lesser scores when contrasted with Gathering A. Consequently, these strategies are thought to be latent concerning understudies' investment in the learning procedure and have sketchy learning results (Burton L. *et al.*, 2011). Shows on an explained demonstrate by a teacher concentrate on the ability to be learnt. Such live exhibitions was discovered better than different types of instructing, prompting expanded understudy certainty, relational abilities and more prominent comprehension of methods. Concentrate done by Bazyk *et al.*, demonstrated that their understudies communicated an inclination for live showings as they permitted them the chance to make inquiries, connect with the teacher, comprehend challenges and mistakes amid the advance of the strategy. Gathering An understudies were presented to live show and were permitted to see the video recording, which upgraded their learning and holding the expertise. This enhanced sensitisation of the scholarly ability through video-helped direction, beats deficits, empowers better representations of reasonable strategies amid little gathering educating. A procedural video that is very much planned and created can be similarly compelling as a live exhibition.

What's more, they have favorable position as the understudies can survey the video whenever contrasted with live exhibit where everybody gathers around the educator (Lester, 1984). Video helped educating is additionally a savvy method for passing on new information, particularly when there is a lack in scholastic staff as they require less time than regular instructing strategies. Refreshing electronic substance is less demanding than printed material where the students can tailor their experience to meet individual learning destinations. Recordings that clarify the procedural advances can be acknowledged as a decent instructing apparatus that will permit better representation of the means on a bigger screen and go about as a sound and video incitement for the understudies. Relative research has likewise demonstrated that video-based guidelines are better than conventional addresses however dissimilar to an educator who really instructed and maybe, offered clarification, the understudies can't rely upon a PC to expound on particular focuses, which indicated none of these strategies replaces live shows and understudies' dynamic support. Concentrates done by Devitt *et al.*, and Holt *et al.*, additionally demonstrated that instructional mixed media must be utilized as a corresponding strategy for educating (Mariani *et al.*, 2013).

No other type of instructing is useful to tenderfoots or moderate students in pre-clinical years. Thus, a mixed educational modules approach is expected to permit adaptability, simple access for refreshing data, eye to eye association, diminish the reiteration and reducing the interest for workforce supervision in an expanded class measure. It likewise urges the understudies to learn and has beneficial outcome on understudies' engine execution. In this investigation, the three showing designs were bestowed to every one of the gatherings in various requests. Distinction in scores were seen among bunches for the three teeth courses of action which uncovered that in a mixed showing educational modules the request of instructing would demonstrate a huge contrast in understudies' learning capacity. Pre-clinical educational modules and understudy's execution are vital in choosing their expertise before they analyze and treat patients in the dental centers. The information they gain must be appropriately seen through a legitimate showing philosophy, which empowers them to associate and apply it with clinical thinking. Showing systems for amateurs directly affect the nature of treatment rendered to patients. Maintenance of gained learning is affected by the request of showing procedure; visual showing designs demonstrated a higher maintenance than addresses and gathering discourses. Subsequently, this investigation was led with a thought process to enhance the present educational modules and to accomplish a perfect request of instructing to help understudies in obtaining a solid and managed learning (Henk G &Silvia, 2015).

Preclinical Prosthodontics is instructed amid the initial two years of the course. Amid this period, the presentation of an understudy is constrained to the research facility, so it is hard to comprehend certain points that are instructed in principle e.g. anatomical historic points, impression making, jaw relations, impediment, throwing imperfections and dental pottery. The learning of the second year understudy can be supplemented with clinical presentation to allow flat and vertical reconciliation of essential sciences with clinical preparing [8]. Prologue to tolerant care should happen as right

on time as conceivable to make the understudies acquainted with the errand they will be seeking after as their calling (Tasha M., Lindsey & John, 2013). In the event that a patient can't be conveyed to the class, a paper based case vignette, video accounts, pictures or case situations on Power Point, liveliness and so forth can be utilized to give ECE. In this examination, video accounts in classroom setting were utilized to execute ECE. Recordings give improvement in perception of the oral pit and enables making of mental portrayal to energize profound learning inside the classroom progression It guarantees that institutionalized data is granted to understudies by various coaches Recordings are useful as the understudies can allude to the material more than once (Dehmer, 2012). The aftereffects of the present examination uncovered that both the control and the investigation amass indicated noteworthy increment in learning contrasted with standard esteems. At the point when OSPE scores were looked at, there was an expansion in the mean scores of the examination gathering however it was not measurably noteworthy. A conceivable clarification for this perception is that the two gatherings did not have a lot of training before their OSPE and change in abilities requires time and practice. The aftereffects of our investigation are in concurrence with those of Smith *et al.* who announced no measurably huge contrasts in reasonable examination comes about utilizing video-cuts as an educating associate (Catherine E *et al.*, 2012).

The principle objective of the investigation was to figure out which attributes of the UW Grass pediatric dentistry turn were related with dental understudies' abnormal amounts of information, experience, and trust in treating pediatric patients. The optional point was to figure out which dental understudies' socioeconomic and clinical preparing factors were related with elevated amounts of learning, knowledge, and trust in treating pediatric patients (Kara A. *et al.*, 2014). There were no factually huge discoveries when the dental understudies' socioeconomic and high number of techniques was contrasted with the seventeen self-evaluated strategies. This can't help contradicting the speculation that an expansion in general clinical encounters or potentially techniques of fourth year dental understudies would have been related with more elevated amounts of information, experience and trust in treating pediatric dental patients (Suzanne, Susan Margaret & Michael Francis, 2015). The understudies finished the self-evaluated overviews at various circumstances amid their dental school preparing. These reviews could have been finished amid the start or end of their fourth year of dental school. On the off chance that they were finished at the outset, an understudy would have had less clinical experience general verses the understudies who finished the study towards end of their fourth year. This would represent shifting levels of understanding, learning, and certainty. The understudies' proposed that more clinical introduction to therapeutic systems would help improve those (Sushma *et al.*, 2014).

## Conclusion

- There have been evidences of students lacking enough exposure to various clinical procedures.
- Level 11 and 12 students are lacking exposure to a number of procedures.
- Factors which had an effect on lack of exposure included instructor's preference of certain treatment, time of the day, patients' commitment, out dated

procedures, under training and inability to find new cases.

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