



IMPACT OF COMMUNITY-BASED DENTAL EDUCATION ON CLINICAL INDEPENDENCE LEVEL

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ABSTRACT

Objectives: This study examines the impact of a two-week community-based dental education (CBDE) rotation on the level of clinical independence among predoctoral dental students at Indiana University School of Dentistry (IUSD).

Methods: Assessments of predoctoral dental students' procedural independence level from the four (4) weeks immediately preceding each respective student's CBDE rotation were compared to assessments from the four (4) weeks immediately following their respective rotation. Descriptive statistics, assessment of sample normality, t-test and stepwise logistic regression were performed to present the difference in average

independence scale scores for the participants in each of the clinical disciplines before and after the CBDE rotation, as well as an average difference in the overall cumulative average scores of the participants.

Results: Study participants' cumulative average independence scores significantly increased ($p=0.005$) following the CBDE rotation.

Conclusions: Predoctoral dental students performed clinical activities significantly more independently immediately after their two-week CBDE rotation than immediately before. This study supports existing literature regarding the benefits of community rotation experiences upon dental school training outcomes. Further examination of CBDE and like programs across dental schools can provide insight into respective program adaptations and level of impact.

METHODS

This study was approved as exempt by Indiana University's Institutional Review Board (Protocol #14692).

Independence Scale

This cross-sectional retrospective study examines the impact of the CBDE rotation on level of clinical independence of predoctoral dental students measured by an independence scale for daily formative assessments of all clinical procedures. The independence scale measures how much guidance a student needs using a defined rubric.

Inclusion Criteria

All qualifying 4th year dental students who are made eligible by completing certain clinical requirements from the Class of 2022 who spent at least 4 weeks at the IUSD clinic following their CBDE rotation.

Data Extraction & Analysis

"Pre" and "post" independence scale assessment reports for each student (linked to their ID) between May 2021 to April 2022 were retrieved from IUSD's database, Axium, under FERPA compliance. Descriptive statistics, assessment of sample normality, t-test and stepwise logistic regression were performed with IBM SPSS statistics software version 28.

FINDINGS

The experiential learning of CBDE programs plays a significant role in improving students' ability to provide care as independent practitioners inside and outside of institutional settings.

- ↑ multiple disciplines & cumulative average independence scores following the CBDE rotation
- Lack of predictive significance related to control variables suggests CBDE rotation was the **most impactful factor**



Procedure Independence

NOTE: These criteria are irrespective of the student's class-year and should be based upon the **expectations of a newly licensed and practicing dentist**. Comments encouraged (required for Critical Deficiency).

Scale:	The Student:
5	Independent Practitioner (Mastery) No guidance: "I was there just in case" Demonstrated virtually complete independence. Performed in a safe manner without instructor assistance.
4	Early Practitioner (Emerging Mastery) Minimal or infrequent guidance: "I directed them from time to time" Demonstrated modest independence. Required occasional prompting, assistance, or supervision for safe practice.
3	Advanced Learner (Progressing) Modest or frequent guidance: "I talked them through it" Demonstrated minimal independence. Able to perform some tasks but required intermittent direction/help (faculty did less than half of it for them).
2	Beginning Learner (Emerging) Complete or extensive guidance: "I did more than half for the student" Demonstrated total or significant dependence on faculty. Required persistent direct supervision and direction.
1	Critical Deficiency Failed to seek appropriate guidance from the faculty or operated with an inappropriate level of independence, leading to unacceptable potential or actual patient harm. Unacceptable preparation or lack of essential knowledge and understanding of the patient/procedure.

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RESULTS

Sample Selection

- Total # of participants: 90 4th year dental students
- Demographics:
 - Average Participant Age: 29.6 years (S.D.= 3.7)
 - Gender Ratio: 34 males and 56 female participants
 - Prior Training: 11 of the participants were part of the International Dentist Program (IDP)

Evidence

- ↑ in mean cumulative average independence score post CBDE rotation ($p=0.005$)
- ↑ average independence scores for all different disciplines, except for decreases in Preventive & Removable Prosthodontics procedures post CBDE rotation
- Weak correlations** observed in evaluating cumulative average of independence level scores with participant characteristics
 - Cumulative average score difference was very weakly correlated with age (0.021), gender (0.014), being part of the IDP (0.088), and the number of procedures performed prior to CBDE (0.05)
 - Control variables lacked predictive significance, thus were excluded from the multiple step regression analysis
- Moderately** positive correlations were observed between prior training experience (IDP) and age (0.495), as well as gender and procedures completed prior to CBDE (0.335)

Discipline	N	Average Before Rotation	Average After Rotation	Mean Change	Significance
Diagnostic (D000-D0999)	88	4.29	4.37	0.077	0.058
Preventive (D1000-D1999)	34	4.49	4.38	-0.115	0.282
Restorative (D2000-D2999)	81	4.17	4.36	0.188	0.000
Endodontics (D3000-D3999)	11	4.14	4.53	0.394	0.063
Periodontics (D4000-D4999)	21	4.34	4.48	0.143	0.251
Removable Pros (D5000-D5999)	35	4.32	4.23	-0.087	0.482
Fixed Pros (D6000-D6999)	21	3.99	4.10	0.113	0.198
Surgery (D7000-D7999)	47	4.21	4.29	0.079	0.426
Miscellaneous (D9000-D9999)	78	4.23	4.30	0.070	0.219
Cumulative (all procedures)	90	4.27	4.34	0.075	0.005

TABLE: Discipline Specific Score Mean & Standard Deviation
N= number of students with scores in this discipline during the study period

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