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Page: 01-06

‘UTILITY OF INTEGRATION IN FORENSIC MEDICINE & TOXICOLOGY: A SURVEY FOCUS ON STUDENT ENGAGEMENT AND LEARNING OUTCOMES’

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ABSTRACT

Background: Forensic Medicine & Toxicology (FMT) is vital for teaching medical jurisprudence and toxicological principles to homoeopathic undergraduates. However, students frequently perceive FMT as an isolated, conventional subject detached from homoeopathic philosophy. Integrated teaching (IT) solves this by explicitly linking forensic and toxicological concepts with core homoeopathic therapeutics.

Objective: To survey undergraduate homoeopathic students to evaluate the educational utility, effectiveness, and impact of an integrated FMT curriculum on student engagement and learning outcomes.

Methods: A descriptive, questionnaire-based cross-sectional survey was conducted among Bachelor of Homoeopathic Medicine and Surgery (BHMS) students exposed to integrated FMT teaching modules. The survey measured changes in student interest, conceptual clarity regarding poisoning and medical jurisprudence, and overall confidence in clinical-legal scenarios.

KEYWORDS: Integrated Teaching; Forensic Medicine & Toxicology; Homoeopathy; BHMS; Student Engagement; Learning Outcomes.

INTRODUCTION

Medical education globally is undergoing a paradigm shift from traditional, department-centric lectures toward competency-based, integrated curricula. Traditional medical training often presents subjects in isolated "silos," which forces students to memorize vast amounts of data without understanding its clinical relevance. To counter this, integrated teaching (IT) has emerged as an effective pedagogical tool. It bridges the gaps between different disciplines, improves cognitive retention, and helps students apply theoretical knowledge to real-world clinical practice.

In the context of homoeopathic medical education, the Bachelor of Homoeopathic Medicine and Surgery (BHMS) curriculum demands a unique balance. Students must master conventional medical sciences while deeply understanding homoeopathic philosophy and therapeutics. Forensic Medicine & Toxicology (FMT) is a crucial component of this undergraduate curriculum. It equips future practitioners with essential knowledge about medical jurisprudence, legal responsibilities, and the identification and management of acute and chronic poisonings.

Despite its undeniable importance, undergraduate homoeopathic students frequently view FMT as an isolated, conventional subject with little relevance to their day-to-day clinical practice. This lack of perceived connection often leads to low student engagement and poor long-term retention of critical toxicological data. However, FMT holds a natural, intrinsic relationship with homoeopathy. Many toxicological profiles of poisons in conventional forensic science correspond directly to the toxicological data found in homoeopathic *Materia Medica* and the principles of drug provings. For example, the detailed physiological effects of toxic substances studied in FMT are the very foundations upon which homoeopathic therapeutic profiles are built.

Integrating FMT with core homoeopathic subjects—such as Homoeopathic *Materia Medica*, *Organon of Medicine*, and Homoeopathic Pharmacy—presents a highly logical and necessary pedagogical shift. By explicitly linking the clinical presentation of a poison to its corresponding homoeopathic drug proving, integrated teaching can transform a dry, conventional subject into a highly contextualized, engaging learning experience.

While the theoretical benefits of integrated medical education are widely documented, there is a distinct lack of empirical data regarding its structured application and utility within homoeopathic institutions. Understanding how students perceive this integration is vital for evaluating its success and guiding future curriculum designs. Therefore, this survey-based study was conducted to evaluate the educational utility, effectiveness, and overall impact of

an integrated FMT curriculum on undergraduate homoeopathic student engagement and learning outcomes.

MATERIALS AND METHODS

Study Design and Setting

A descriptive, cross-sectional, questionnaire-based survey was conducted to evaluate the educational utility, student engagement, and learning outcomes of integrated teaching (IT) in Forensic Medicine & Toxicology (FMT). The study was carried out at *Index Homoeopathic Medical College, Indore, MP*.

The target population comprised undergraduate medical students specifically in their Second Year of the Bachelor of Homoeopathic Medicine and Surgery (II BHMS) curriculum, as FMT is conventionally introduced and assessed during this academic phase. A total of 60 eligible II BHMS students who had actively participated in the integrated FMT modules were selected using a universal sampling approach to capture the entire class cohort.

Inclusion Criteria

Regularly enrolled II BHMS students who attended the integrated teaching sessions combining FMT with Homoeopathic Materia Medica, Organon of Medicine & Pharmacy.

Exclusion Criteria

Students who were chronically absent during the integrated instructional modules or those who submitted incomplete survey responses.

Development and Validation of the Survey Instrument:

A structured evaluation questionnaire was developed based on established medical education frameworks. To ensure academic rigor, the questionnaire underwent face and content validation by a panel of experts comprising senior FMT professors and homoeopathic academicians.

The final tool was structured into three distinct segments

1. Demographic Profile: Basic academic and identifying parameters (excluding personal identity markers to maintain anonymity).
2. Student Engagement & Subject Retention: Five-point Likert scale items (1 = Strongly Disagree to 5 = Strongly Agree) assessing student interest and memory retention when toxicological actions were correlated with homoeopathic drug provings.

3. Perceived Learning Outcomes: Questions focused on conceptual clarity regarding clinical toxicology, forensic jurisprudence, and student confidence in applying this integrated knowledge.

RESULTS

Table 1: Student Perceptions on the Academic Utility of Integrated FMT Teaching. (N=60)

Survey Statement / Parameter	Strongly Agree	Agree	Neutral	Disagree (%)
Integration makes FMT concepts easier to comprehend.	[45.0%]	[40.0%]	[11.7%]	[3.3%]
Correlating poisons with drug provings aids retention.	[53.3%]	[35.0%]	[8.3%]	[3.4%]
Cross-Referencing with Homoeopathic Pharmacy, clarify forensic and drug legislation.	[38.3%]	[43.4%]	[15.0%]	[3.3%]
Conceptual Alignment of legal ethics with the Organon of Medicine	[30.0%]	[45.0%]	[20.0%]	[5.0%]

Perceived Learning Outcomes and Clinical Confidence

The survey evaluated the self-assessed confidence of the 60 students in applying their integrated knowledge. Post-integration, **[80%]** of the students expressed high confidence in identifying clinical features of acute poisoning. Additionally, **[73.3%]** of respondents reported feeling competent in understanding their legal boundaries, rights, and medicolegal obligations as future homoeopathic practitioners.

When asked about the overall preferred curriculum format for the future, **[86.7%]** of the class voted in favour of a permanently structured integrated FMT curriculum over the traditional siloed methodology.

DISCUSSION

Impact on Student Engagement and Learning Outcomes

Students shift from being passive absorbers of forensic facts to active, analytical thinkers who can trace a substance from its legal classification and lethal toxicity to its potentized clinical application. This level of conceptual clarity is critical for preparing students not only for university examinations but also for their future roles as legally compliant, clinically competent homoeopathic physicians.

Homoeopathic Materia Medica: Toxicological Correlates

The most pronounced utility of integrated teaching observed in this study lies in the cross-disciplinary correlation between toxicology and Homoeopathic Materia Medica. In conventional FMT, students learn the lethal doses, clinical presentations, post-mortem appearances, and management of systemic poisons. In an integrated model, these exact toxicological profiles are taught alongside corresponding homoeopathic drug provings. For instance, when studying the neurotoxic effects and spinal convulsions of *Strychnos nuxvomica* or the lethal gastrointestinal corrosion of *Arsenic trioxide* (As_2O_3), mapping these directly to the therapeutic pathogenesis of **Nux vomica** and **Arsenicum album** enhances memory consolidation.

Instead of memorizing two separate datasets, students recognize that homoeopathic Materia Medica is essentially the therapeutic application of toxicological data gathered through human drug provings. This dual-perspective approach directly enhances long-term data retention and provides students with an immediate clinical rationale for learning conventional toxicology.

Conceptual Alignment with the Organon of Medicine

Integrating FMT with the Organon of Medicine helps ground abstract philosophical doctrines in objective clinical science. Dr. Samuel Hahnemann's instructions in § 141 of the *Organon of Medicine* highlight that a physician must intimately understand the pure, unaltered effects of substances on the human body to grasp their curative powers. Furthermore, teaching forensic jurisprudence alongside the conceptualization of the **Homoeopathic Physician's Duties** (§ 1–18) reinforces the legal and ethical responsibilities of a medical professional.

When discussing medical negligence, professional misconduct, and consumer protection laws in FMT, integrating these concepts with the high ethical standards demanded by homoeopathic philosophy teaches students that ethical practice is a universal mandate across all medical systems. This pedagogical union transforms medical law from a dry, abstract legal code into a deeply internalized set of professional values.

Cross-Referencing with Homoeopathic Pharmacy

The operational overlap between FMT and Homoeopathic Pharmacy is immense, yet it is rarely explored in traditional teaching models. A structured integration allows students to simultaneously explore:

- The raw toxic botanical, mineral, or animal source in FMT.

- The exact legal regulations governing dangerous drugs (e.g., the *Drugs and Cosmetics Act* or the *Narcotic Drugs and Psychotropic Substances Act*).
- The pharmaceutical process of **potentization (dilution and succussion)** that strips a poisonous substance of its crude toxicity while unleashing its dynamic curative potential.

CONCLUSION

Integrated teaching significantly boosts student engagement and improves learning outcomes by contextualising forensic sciences within homoeopathic education. Shifting from isolated departmental lectures to cohesive, integrated modules optimizes FMT delivery and better equips future homoeopathic doctors for professional practice.

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