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From Shastra to Simulation: Innovative Teaching Methods for Competency-Driven Learning in Agad Tantra

Sud Sushant¹, Mangattu Sachin², Jangid Sushil Kumar³,
Chhatbar Disha⁴

¹Ass. Prof, Dept of Agad Tantra, ITRA, INI, MoA, GOI, Jamnagar, Gujarat

²Asso. Prof, Dept of Agad Tantra, IARH, Rajkot, Gujarat

³Ass. Prof, Dept of Agad Tantra, IAS&R, Shri Krishna Ayush University, Kurukshetra, Haryana

⁴PhD Scholar, Dept of Agad Tantra, ITRA, INI, MoA, GOI, Jamnagar, Gujarat

ABSTRACT: Introduction: Agad Tantra, the Ayurvedic science of toxicology, has traditionally been rooted in textual wisdom preserved in classical Shastras. With the implementation of competency-based medical education (CBME), there is a paradigm shift toward experiential, integrative, and simulation-driven approaches. This study examines innovative teaching methods that align traditional knowledge with modern pedagogy.

Methods: A narrative review of publication trends from 2021–2025 was conducted to identify scholarly interest in competency-based Agad Tantra education. Key themes analyzed included curriculum design, assessment strategies, and Entrustable Professional Activities (EPAs).

Results: The review highlights increasing academic focus on integrating simulation-based training, competency-driven frameworks, and interdisciplinary learning models. Emerging literature demonstrates how CBME principles are being adapted to strengthen both theoretical and practical aspects of Agad Tantra education. Discussion: Simulation, integrative learning, and competency-based frameworks offer transformative potential for Agad Tantra, positioning it as a globally relevant discipline. Bridging classical Ayurvedic toxicology with modern educational strategies ensures sustainability, adaptability, and enhanced learner outcomes.

Conclusion: Competency-based innovations in Agad Tantra education can revitalize this ancient discipline, making it more applicable to contemporary medical training and global health contexts.

1. INTRODUCTION

Agad Tantra, described in classical treatises such as the Charaka Samhita and Sushruta Samhita, encompasses identification, classification, and management of poisons (Visha), antidotal formulations (Agada), and medico-legal responsibilities. Historically, pedagogy was rooted in Shastra-adhyayana (textual immersion), guru–shishya apprenticeship, and dialogic oral examinations.⁹

While epistemologically robust, this model emphasized knowledge acquisition over structured demonstration of competence. Contemporary healthcare demands practitioners capable of emergency response, medico-legal documentation, interdisciplinary coordination, and ethical reasoning. Globally, CBME has emerged as a transformative paradigm, shifting focus from time-based training to outcome-based competencies.^{1, 4} CBME emphasizes observable abilities integrating

knowledge, skills, values, and professionalism.¹⁸ Implementation challenges include assessment standardization, faculty preparedness, and contextual adaptation.⁷

Within Ayurveda, educational reforms led by NCISM have introduced defined graduate attributes, early clinical exposure, logbooks, and AETCOM modules.^{10, 12} However, Agad Tantra-specific competency mapping and entrustment frameworks remain insufficiently structured. Entrustable Professional Activities (EPAs), conceptualized by Ten Cate², operationalize competencies into measurable professional tasks. Their structured description enhances clarity and accountability.²⁶ Integration of EPAs into Agad Tantra could bridge classical knowledge and clinical performance.

This review critically evaluates educational innovations and proposes a competency-driven framework for Agad Tantra aligned with global standards.

2. AIM

To explore and evaluate the integration of competency-based medical education (cbme) principles into agad tantra (ayurvedic toxicology), with a focus on innovative teaching methods, entrustable professional activities (epas), and assessment strategies that bridge classical textual wisdom with modern pedagogical frameworks.

3. OBJECTIVES

1. To analyze the historical foundations of agad tantra education and its reliance on shastra-based textual learning.
2. To examine recent reforms introduced by the National Commission for Indian System Of Medicine (NCISM) in competency-based curricula for ayurveda.
3. To identify innovative teaching-learning methods such as simulation, integrative learning, and case-based discussions applicable to Agad Tantra.
4. To evaluate the role of entrustable professional activities (EPAS) in assessing competencies specific to ayurvedic toxicology.
5. To propose a framework for competency-driven Agad Tantra education that aligns with global medical education standards.

4. PRIMARY OUTCOME

1. To propose a competency-based framework for Agad Tantra education.
2. To identify the gaps and opportunities for future research and implementation.

5. MATERIALS AND METHODS

5.1 Methodology

Study Design, Data Sources and Data Collection:

A narrative review methodology was adopted with sources from the classical Ayurvedic texts for traditional perspectives, policy documents and curriculum guidelines issued by NCISM and peer-reviewed publications (2021–2025) on CBME, Ayurveda education, and EPAs.^{11, 15, 24}

Databases including PubMed, Scopus, and Google Scholar were searched for publications between 2021 and 2025 using keywords: Agad Tantra education, competency-based Ayurveda, simulation in medical education, CBME in toxicology, and Entrustable Professional Activities.

5.2 Inclusion Criteria

- Peer-reviewed articles on CBME, simulation, and EPAs
- Publications addressing Ayurveda education reform
- Toxicology education models relevant to integrative practice

5.3 Exclusion Criteria

- Opinion pieces without educational framework
- Non-peer-reviewed commentaries

5.4 Publications were analyzed under three domains:

1. Curriculum Design Innovations – Alignment of learning objectives with competencies.
2. Assessment Strategies – Objective Structured Clinical Examination (OSCE), workplace-based assessments, reflective portfolios.
3. Entrustable Professional Activities (EPAs) – Defined professional tasks relevant to toxicology practice.

5.5 Data Analysis

Data Analysis abide by the thematic synthesis to compare traditional text-centric approaches with modern competency-based models, mapping of identified competencies to potential EPAs in Agad Tantra and critical appraisal of integrative and simulation-based learning strategies with

5.6 Historical Foundations of Agad Tantra Education

Classical Ayurvedic pedagogy prioritized:

1. Textual Immersion (Shashtra-Adhyayana): Memorization and commentary-based interpretation of canonical treatises. Agad Tantra training was rooted in deep engagement with classical treatises, where memorization intertwined with analytical exposition to cultivate interpretative precision.
2. Experiential Apprenticeship: Clinical exposure under the Guru. Knowledge matured through bedside learning, as disciples internalized toxicological wisdom by observing and assisting the Guru in real clinical contexts.
3. Moral and Ethical Conditioning: Emphasis on physician conduct. The pedagogy emphasized character formation, ensuring that competence in toxicology was balanced by restraint, compassion, and ethical accountability.
4. Oral Examination Traditions: Dialogic assessment (Viva Voce prototypes). Dialogic evaluation through structured scholarly debate served as an early prototype of viva voce, sharpening reasoning and diagnostic articulation.

Agad Tantra chapters in the Charaka Samhita and Sushruta Samhita describe symptomatology of poisons, antidotal formulations, and detoxification methods (Shodhana, Prayoga). While conceptually comprehensive, historical pedagogy prioritized knowledge acquisition over structured competency demonstration.^{9, 10}

5.7 Limitations in the contemporary context include:

- Limited exposure to emergency toxicology scenarios.
- Inadequate simulation of snakebite management.
- Minimal integration with forensic toxicology laboratories.
- Assessment predominantly theory-based.

Thus, while epistemologically rich, the pedagogical model requires structured modernization.

5.8 NCISM Reforms and Competency-Based Curriculum in Ayurveda

The National Commission for Indian System of Medicine has restructured Ayurveda education through competency-driven reforms.

- It has clearly outlined graduate attributes for outcome-oriented training.
- Skill-focused modules now emphasize practical proficiency.
- Mandatory logbooks ensure documented experiential learning.
- Early clinical exposure connects theory with real-world practice.
- AETCOM integration strengthens attitude, ethics, and communication skills.^{10, 11, 12}

These changes reflect global Competency-Based Medical Education principles by prioritizing measurable outcomes over time-bound training.^{1, 4} Yet, in Agad Tantra, operational clarity remains insufficient, competency statements often lack defined performance benchmarks, assessment rubrics and entrustment criteria are inadequately specified, developing discipline-specific EPAs is essential to ensure safe and accountable toxicological practice.^{2, 26}

5.9 Syllabus Rationalization: Identifying Obsolete Components in Agad Tantra

A competency-based curriculum demands not only the addition of relevant learning experiences but also the critical evaluation and rational omission of content that has lost clinical relevance in contemporary practice. While the classical Agad Tantra syllabus is encyclopedic in its scope, several components were designed within a historical socio-medical context that no longer pertains to modern healthcare delivery. Retaining such content without critical appraisal burdens learners and dilutes the pedagogical focus on clinically applicable competencies.

5.10 The Case for Curriculum Pruning

In alignment with CBME principles, the Agad Tantra curriculum must be evaluated through the lens of current clinical relevance, patient safety, and professional accountability. Topics that are archaic, non-reproducible in a modern laboratory setting, or substituted entirely by contemporary pharmacological or forensic methods should be earmarked for omission or condensation, freeing curricular space for simulation, medico-legal training, and applied toxicology. ^{2, 22, 24, 26}

5.11 Chaturvimsathi Upakrama: A Critical Appraisal

The Chaturvimsathi Upakrama — the twenty-four therapeutic measures described in classical texts for the management of Visha — represents one such domain warranting reconsideration. While these measures were systematically rational within the epistemological framework of classical Ayurveda, several among them lack translational relevance to contemporary emergency toxicology practice. Procedures such as specific fumigation techniques (Dhupana), application of certain irritants for emesis induction, and complex multi-step detoxification rituals (Murchha Nashana) have been either superseded by evidence-based antidotal therapies or rendered impractical by modern clinical settings.

Rather than wholesale retention of all twenty-four Upakrama with equal pedagogical weight, a rational approach would involve:

1. Retaining principles with documented physiological rationale (e.g., Vamana for ingested non-corrosive poisons, Virechana for systemic toxin clearance).
2. Condensing or contextualizing obsolete procedural Upakrama as historical references rather than assessed competencies.
3. Mapping retained Upakrama to contemporary emergency protocols where pharmacological equivalence exists. ^{1, 5, 6, 7}

5.12 Other Areas for Rational Omission or Condensation

Beyond the Chaturvimsathi Upakrama, several other domains of the traditional Agad Tantra syllabus merit critical review:

- Deva Visha and Abhichara-related content: Descriptions of divine poisons and poison related to supernatural causation carry no clinical applicability and may be retained only as historical curiosities, not as assessed learning outcomes.
- Elaborate multi-drug Agada formulations with unavailable raw materials: Classical compound formulations involving rare, restricted, or ecologically endangered ingredients cannot be demonstrated or prepared in institutional settings and should be acknowledged in text without requiring practical competency.
- Ritualistic detoxification procedures (Mantra, Yantra, Tantra-based Visha Chikitsa): While culturally significant, these practices lie outside the scope of competency-based clinical training and should be relocated to elective or historical context modules.
- Lengthy classifications of Visha with minimal clinical differentiation: Certain sub-classifications within Sthavara and Jangama Visha offer negligible clinical utility compared to the time invested. These may be consolidated into umbrella categories with emphasis on symptom clusters and management principles.

By systematically pruning these components, the Agad Tantra curriculum can be streamlined to prioritize content that directly enhances the learner's ability to manage real-world toxicological emergencies, contribute to medico-legal proceedings, and apply Ayurvedic principles within an integrative clinical framework. This rationalization does not diminish the classical heritage of Agad Tantra; rather, it honours it by ensuring its survival and relevance in contemporary medical education. ^{14, 15, 17, 18, 20}

5.13 Role-Play as an Experiential Pedagogy in Agad Tantra Education

Among the most underutilized yet educationally powerful strategies in Agad Tantra training is structured role-play. Unlike simulation, which primarily replicates clinical procedures, role-play engages the learner in holistic, context-sensitive scenarios that mirror the professional realities of a practitioner engaged in toxicology, forensic medicine, and medico-legal work. In a

discipline that demands simultaneous clinical acumen and legal accountability, role-play offers an irreplaceable experiential scaffold.^{17, 18}

1. Court Proceedings and Medico-Legal Testimony

Agad Tantra has always been the discipline at the intersection of medicine and law. Classical texts elaborately describe the duties of the Vaidya as an expert witness — assessing injury, opining on the nature of poisoning, and testifying before the king's court. In contemporary practice, this translates to duties before courts of law, police investigations, and medical boards. The structured role-play involving mock court proceedings equips students with:

- The ability to present clinical findings as objective medical evidence before a judicial authority.
- Familiarity with medico-legal terminology, evidentiary standards, and cross-examination protocols.
- Confidence in defending clinical observations under adversarial questioning.
- Understanding of the ethical obligations of a medical expert witness, including impartiality, accuracy, and transparency.

In such role-plays, students may alternate between the roles of medical witness, defense and prosecution counsel, judge, and court recorder. This multiplicity of perspectives deepens understanding of how medical evidence is interpreted, challenged, and adjudicated — a competency that no textbook alone can impart.^{16, 17, 18, 19}

2. Examination of an Injured Person

The examination of an injured person is a core medico-legal competency that Agad Tantra practitioners are expected to demonstrate. Classical Nidana Panchaka principles — Hetu, Purvarupa, Rupa, Upashaya, Samprapti — provide a structured lens for clinical assessment that aligns well with modern forensic examination protocols. Role-play scenarios involving the examination of a simulated injured patient enable students to:

- Practice systematic documentation of injuries, their nature, severity, and possible causative agents (chemical, biological, or mechanical).
- Apply principles of wound aging, pattern recognition of envenomation, and differentiation between ante-mortem and post-mortem injuries.
- Prepare injury certificates, toxicological referral letters, and medico-legal reports using standardized formats.
- Experience the interpersonal dynamics of examining an unwilling, distressed, or unconscious patient — including obtaining informed consent and maintaining ethical conduct.

Such scenarios may be enacted in collaboration with departments of forensic medicine, allowing interdisciplinary competence to develop organically. The integration of simulated police inquiry adds another layer of authenticity, preparing students for real-world medico-legal encounters.^{19, 20}

3. Enacting Symptoms of Poisoning for Clinical Recognition

One of the most innovative applications of role-play in Agad Tantra is the enactment of poisoning symptomatology by learners themselves. This approach — where one group of students simulates the clinical presentation of a poisoned patient and another group diagnoses and manages — creates a visceral, memorable learning experience that significantly outperforms passive didactic teaching. There are specific scenarios of high pedagogical value include:

- Spinal poisons (Medullary or CNS-acting toxins): Students enacting progressive motor weakness, ascending paralysis, respiratory distress, and loss of consciousness as seen in neurotoxic snake envenomation or organophosphate poisoning. Observers develop pattern recognition for the clinical trajectory of systemic neurotoxicity, which is difficult to describe verbally but instantly recognizable when embodied.
- Cardiac toxins (e.g., oleander, aconite): Enactment of bradycardia, hypotension, palpitations, and syncope, enabling students to recognize cardiotoxic poisoning profiles.
- Gastrointestinal poisons: Role-playing the acute onset of nausea, vomiting, abdominal cramping, and diarrhea in food poisoning scenarios or corrosive ingestion, with attention to clinical progression and differential diagnosis.
- Psychoactive/deliriant poisons (Datura, cannabis): Depicting altered mentation, hallucinations, mydriasis, and agitation — scenarios particularly relevant to rural and community toxicology.

Enacting these presentations demands that students study and internalize the pathophysiological mechanism behind each symptom cluster. The student who must convincingly portray ascending paralysis must first deeply understand the mechanism of neuromuscular blockade. This enforced internalization creates durable, application-oriented knowledge — precisely the outcome CBME seeks.^{19, 20, 21}

4. Integrating Role-Play into the Assessment Framework

For role-play to be pedagogically effective, it must be paired with structured observation and formal assessment. This can be achieved through:

- OSCE stations specifically designed around role-play scenarios (e.g., 'you are the medical expert witness in the following case — respond to the court's questions').
- Reflective journaling after each role-play session, prompting students to articulate clinical reasoning, ethical dilemmas encountered, and personal learning.
- Peer assessment tools allowing students who observed to evaluate the performance of those who enacted.
- Faculty-moderated debriefing sessions where clinical and legal inaccuracies are corrected and best practices are reinforced.

Embedding role-play within the EPA framework further strengthens its utility. For instance, the EPA 'Conducting medico-legal examination of a poisoning victim' can be directly assessed through role-play performance, providing observable, documentable evidence of entrustable professional competence.^{18, 19, 20}

5.14 Fallouts and Observations

1. Curriculum Reforms in Agad Tantra

Recent literature indicates a shift from content-heavy syllabi to outcome-based frameworks. Competencies are now defined under domains such as:

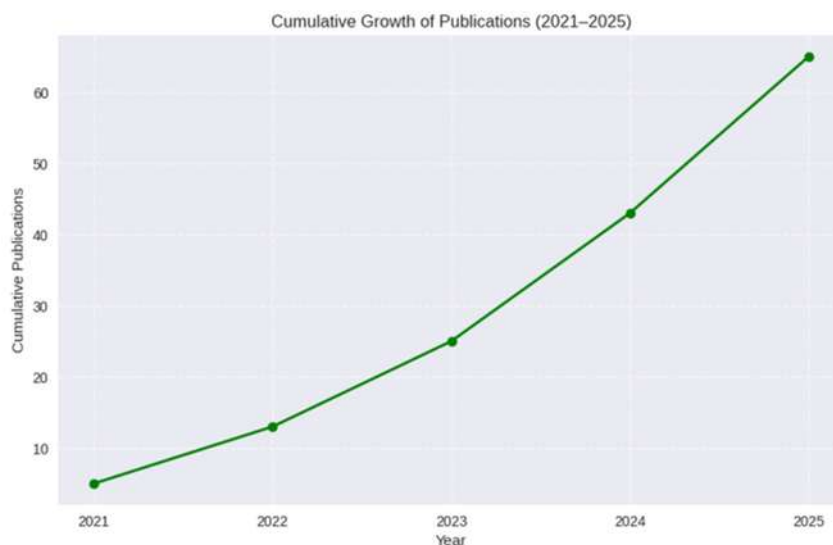
- Identification and management of common poisons.
- Interpretation of toxicological signs and symptoms.
- Emergency first aid and referral decision-making.
- Ethical and medico-legal documentation.

Mapping classical textual content to measurable outcomes ensures vertical integration between theory and clinical application.^{4, 7, 8}

2. Simulation-Based Training

Simulation laboratories enable practice of emergency management in snakebite, scorpion sting, food poisoning, and chemical exposure. High-fidelity mannequins, virtual toxicology modules, and digital case simulations allow repetitive, risk-free skill acquisition.^{5, 6}

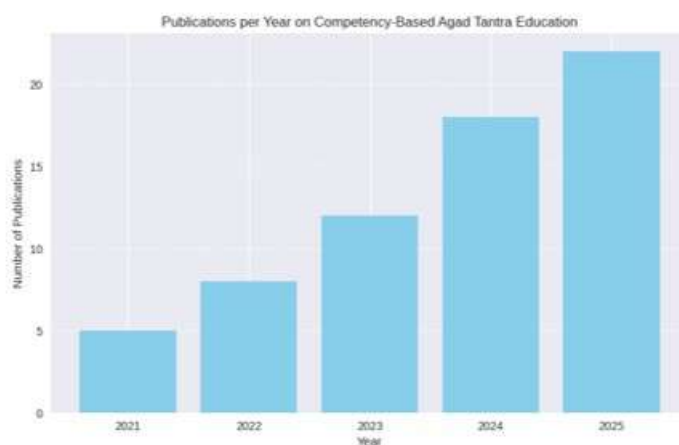
Studies between 2021–2025 report improved learner confidence and clinical reasoning following structured simulation sessions. Hybrid simulation integrating Ayurvedic assessment (Prakriti, Dosha, Agni status) with biomedical toxicology parameters enhances integrative competence. The publication trends are highlighted in (Graph-1)



The following bar chart illustrates the growth in publications related to competency-based Agad Tantra education and integrative learning (2021–2025).

Publications increased from 5 in 2021 to 22 in 2025, highlighted in (Graph-2) showing a steady rise in scholarly engagement with Key points as:

- 2021: 5 publications – Early discussions on CBME in Ayurveda.
- 2022: 8 publications – Initial NCISM reforms introduced.
- 2023: 12 publications – Growing interest in integrative curriculum.
- 2024: 18 publications – Simulation-based methods highlighted.
- 2025: 22 publications – EPA-based assessment frameworks gaining traction.



3. Assessment Innovations

Traditional viva voce examinations are increasingly supplemented by:

- OSCE stations for identifying toxic plants or performing gastric lavage steps.
- Mini-CEX (Clinical Evaluation Exercises) for bedside evaluation of envenomation cases.
- Reflective portfolios documenting exposure to poison information centres.

Assessment aligned with Miller's pyramid ("knows" to "does") ensures progression from textual recall to clinical performance. ^{3, 16, 24}

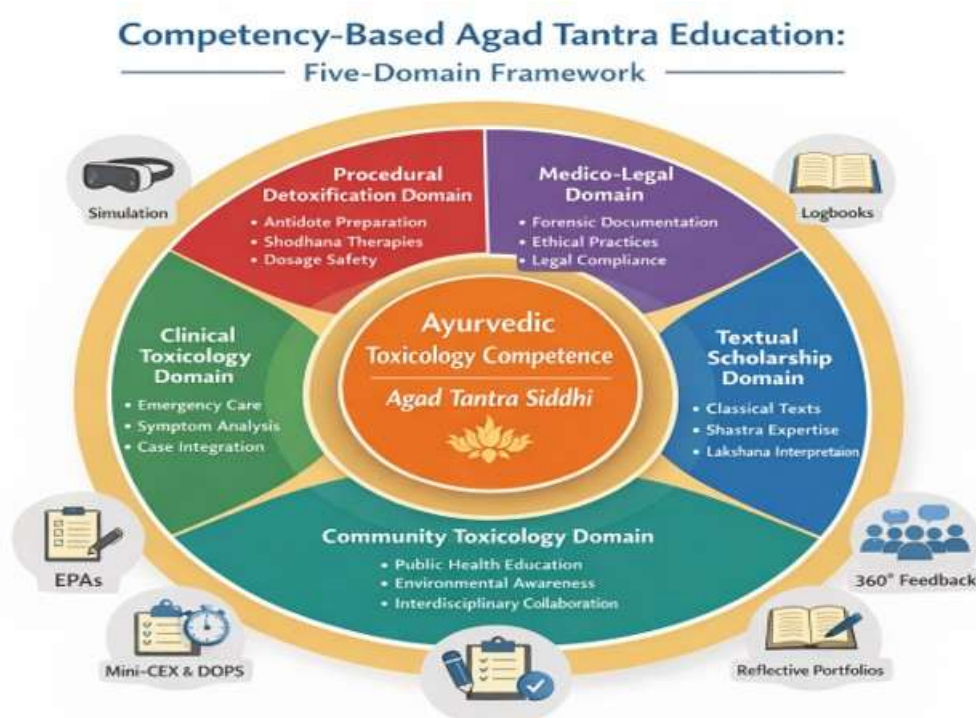
4. Entrustable Professional Activities (EPAs)

Emerging literature proposes EPAs specific to Agad Tantra, such as:

- Conducting primary assessment of a poisoning case.
- Preparing and administering classical Agada formulations safely.
- Counseling patients and relatives regarding toxic exposure prevention. ^{2, 26}

EPAs provide clarity in expectations and ensure safe entrustment of responsibilities.

Proposed Framework for Competency-Driven Agad Tantra Education (Siddhi) highlighting five-Domain Competency Model- Five-Domain Competency Model Framework



1. Epistemic Foundation (Pramana Jnana): Mastery of Ayurvedic sources of knowledge guiding toxicological reasoning.
2. Dravya-Visha Literacy: Deep understanding of Visha Swarupa through Rasa, Guna, Virya, Vipaka, and Prabhava.
3. Clinical Acumen (Vyavaharika Kaushalya): Skilled assessment, diagnosis, and Agada-based interventions.
4. Procedural Precision (Shodhana–Prayoga Dakshata): Safe handling, detoxification, and formulation competencies.
5. Ethical and Public Health Responsibility (Swastharakshana Dharma): Commitment to safety, documentation, and societal toxicovigilance.

Each domain aligns with global medical education standards related to Knowledge, Skills, Professionalism, Communication and Systems-based practice highlighting:

1. Education (Siddhi) envisions Agad Tantra training rooted in classical wisdom and validated through measurable competence.
2. The framework integrates Ayurvedic epistemology with the structured discipline of Competency-Based Medical Education (CBME).
3. Learning shifts from rote textual recall to demonstrable toxicological proficiency.
4. The Five-Domain Competency Model harmonizes Shastra, Yukti, and clinical accountability.

5. Each domain reflects the continuum from knowledge acquisition to applied Visha management.

This model preserves Ayurvedic cognition while embracing outcome-oriented CBME rigor for Siddhi in Agad Tantra. ^{1, 4, 17}

6. RESULTS AND DISCUSSION

The integration of Competency-Based Medical Education (CBME) into Agad Tantra (Ayurvedic toxicology) offers a transformative pathway to modernize this vital discipline while preserving its classical foundations. Agad Tantra, rooted in ancient Ayurvedic texts such as the Charaka Samhita, Sushruta Samhita, and Ashtanga Hridaya, has historically emphasized the identification, management, and prevention of poisoning from diverse sources—Sthavara (inanimate/plant-based), Jangama (animate/animal-based), and Gara Visha (artificial/compound poisons). By aligning this epistemological heritage with contemporary educational paradigms, educators can enhance the relevance, effectiveness, and global applicability of Agad Tantra training without compromising its core principles.

6.1. Integrating Learning and Curriculum

A cornerstone of this integration is the harmonious blending of Shashtra-based foundations with competency-driven approaches. Classical texts continue to serve as the primary epistemological base, providing timeless insights into toxicological principles, diagnostic methods, and therapeutic interventions. However, a purely textual curriculum is insufficient for contemporary practice. A competency-based curriculum shifts the focus toward observable skills, ethical reasoning, and medico-legal applications; ensuring graduates are equipped to handle real-world scenarios involving poisoning, envenomation, and environmental toxins.

Simulation-driven pedagogy emerges as a powerful bridge between tradition and modernity. Virtual toxicology labs, immersive case simulations, and forensic role-play scenarios allow students to engage experientially with complex emergencies. Simulation-based medical education is globally recognized for its proven impact on improving patient safety, procedural competence, and clinical decision-making. In the context of Agad Tantra, simulations enable learners to practice emergency response protocols derived from classical texts—such as the administration of antidotes or detoxification measures—while synchronizing them with modern resuscitative techniques like advanced life support and antidote protocols.

This pedagogical shift respects the epistemological foundations of Ayurveda by embedding classical toxicological classifications (Sthavara, Jangama, Gara Visha) into case-based learning modules. These can be mapped onto modern toxin categories (e.g., heavy metals, pesticides, snake venoms, and pharmaceutical overdoses), fostering a deeper, integrated understanding. Such an approach not only reinforces ancient wisdom but also prepares students for interdisciplinary challenges in emergency medicine and public health.

6.2. Assessment Innovations

Traditional methods of assessment in Agad Tantra, such as viva voce examinations and textual recall, often fall short in evaluating practical competencies required for modern practice. To address this, the adoption of innovative assessment strategies is essential. Entrustable Professional Activities (EPAs) provide a robust framework for observable, trust-based evaluation. EPAs allow supervisors to assess and progressively entrust learners with critical tasks, such as managing acute snakebite envenomation, performing medico-legal documentation in poisoning cases, or conducting toxicological investigations.

An integrated assessment model—combining written examinations, objective structured clinical examinations (OSCEs), simulation performance metrics, and EPA entrustment decisions—ensures a holistic evaluation of knowledge, skills, and attitudes. Emerging technologies further enrich this landscape. Virtual reality (VR) and augmented reality (AR) can recreate high-stakes scenarios, such as cobra envenomation, food contamination outbreaks, or industrial chemical exposures. Interactive e-learning modules and artificial intelligence-driven adaptive quizzes personalize learning pathways, adapting difficulty and content to individual learner needs and progress. These innovations move assessment beyond rote memorization toward demonstrable clinical readiness and professional entrustment.

6.3. Global Relevance

Agad Tantra education, when reframed through CBME, gains significant global relevance through interdisciplinary integration. The discipline naturally converges toxicology, forensic medicine, pharmacology, clinical toxicology, and medical

ethics. Collaborative partnerships with departments of forensic medicine, emergency medicine, pharmacology, and environmental health can foster integrative competence. Practical exposure to poison control centers, toxicology laboratories, and biomedical facilities bridges Ayurvedic and allopathic perspectives, enriching diagnostic and therapeutic approaches.

The growing body of publications on Ayurvedic toxicology underscores increasing international recognition of its contributions to global health. Poisoning remains a pressing public health challenge worldwide, particularly in regions with high exposure to herbal medicines, plant toxins, snakebites, and environmental contaminants. By embedding CBME principles, Agad Tantra can meaningfully contribute to the global toxicology discourse—offering evidence-informed insights into traditional antidotes, herbal poisoning management, and culturally sensitive preventive strategies. This positions Ayurveda as a valuable complementary system in addressing universal toxicological threats.

6.4. Faculty Development and Implementation Considerations

Successful implementation of CBME in Agad Tantra hinges on robust faculty development. Educators require targeted training in assessment design, constructive feedback delivery, simulation facilitation, and educational research methodologies. Continuous professional development programs will be instrumental in sustaining these curricular innovations and ensuring long-term pedagogical excellence.

This integration represents an epistemic evolution rather than displacement. Classical Ayurvedic texts implicitly emphasize physician competence, detailing the qualities and skills of an ideal Vaidya (physician). CBME makes these expectations explicit, measurable, and accountable. An EPA-based approach particularly strengthens accountability, patient safety, clinical confidence, and interdisciplinary credibility.

Nevertheless, several challenges must be acknowledged: faculty training deficits, infrastructure limitations (especially in simulation and digital technologies), and potential resistance to pedagogical change within traditional academic settings. These can be mitigated through phased implementation strategies—beginning with pilot modules in select institutions—alongside faculty development workshops, resource-sharing consortia, and collaborative networks among Ayurvedic universities and modern medical colleges.

In conclusion, integrating CBME into Agad Tantra revitalizes this ancient discipline for the demands of 21st-century healthcare. By grounding innovation in classical foundations, leveraging simulation and technology, and prioritizing measurable competencies, Agad Tantra can produce highly skilled, ethically grounded, and globally competent Ayurvedic toxicologists. This evolution not only enhances educational outcomes but also strengthens Ayurveda's role in safeguarding public health against toxicological threats, both locally and worldwide. Future research should evaluate the long-term impact of these curricular reforms on graduate performance, patient outcomes, and interdisciplinary collaboration.

7. CONCLUSION

The journey from Shastra to simulation represents a transformative evolution in Agad Tantra education. Competency-driven frameworks, integrative curricula, and EPA-based assessments ensure that learners are not only knowledgeable but also skilled, ethical, and globally relevant practitioners. The steady rise in publications (2021–2025) underscores the scholarly momentum toward modernizing Agad Tantra. By embracing simulation, integrative learning, and competency-based assessment, Ayurveda can strengthen its credibility and contribute meaningfully to contemporary medical education.

The transition from Shastra-based didacticism to simulation-driven, competency-based pedagogy marks a transformative era for Agad Tantra education. Integrating classical Ayurvedic toxicology with CBME principles strengthens theoretical understanding, clinical skill, and professional accountability. Simulation, EPAs, interdisciplinary exposure, and digital tools collectively revitalise Agad Tantra, ensuring its relevance in modern medical curricula and global health systems.

Sustained curricular reforms, faculty development, and educational research will be pivotal in embedding competency-driven learning within Agad Tantra. The journey from textual wisdom to experiential mastery symbolises not departure from tradition but dynamic continuity—where ancient knowledge thrives through innovative pedagogy.

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AUTHOR CONTRIBUTIONS

Sud Sushant: Conceptualization of the theme “From Shastra to Simulation”, design of competency-driven teaching framework, and drafting of the manuscript.

Mangattu Sachin: Development of innovative pedagogical strategies, integration of simulation-based modules, and critical revision of the manuscript for academic rigor.

Jhangid Sushil: Contribution to literature review, case-based applications in Agad Tantra, and refinement of the final draft for clarity and coherence.

Disha Chhatbar: Involvement to literature review and refinement of the final draft for clarity and coherence.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ETHICS STATEMENT

Ethical approval was not required for this study.

DATA AVAILABILITY STATEMENT

The study “From Shastra to Simulation: Innovative Teaching Methods for Competency-Driven Learning in Agad Tantra” is based on conceptual frameworks, pedagogical models, and classroom experiences rather than primary datasets. No external datasets were generated or analyzed during the current study.

All supporting materials, references, and teaching modules discussed are available within the manuscript itself. Further clarifications or academic resources can be obtained from the corresponding author upon reasonable request.

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