

Constructive Teaching Methods for *Shalya Tantra* - A Descriptive Review from Primeval to Current Practice

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ABSTRACT

Introduction: Teaching and learning are two sides of a coin that must go hand in hand. The educational plans should be planned in such a way which could boost not only the conceptual understanding but also be able to develop practical skills and knowledge of the students. Various teaching modalities have been evolved with time but no literature is found with respect to *Shalya tantra*. The father of Surgery, *Acharya sushruta* also gave a special emphasis on teaching methods which are still pertinent with current practice. **Methods:** In this article, we are presenting a descriptive review from primeval time to the current practice of teaching methods especially for the fraternity of the Ayurvedic surgical branch. The work is compiled after extensively reviewing literature of both classical and contemporary literature as well as published works in PubMed, Scopus, and Google Scholar. **Results:** No standardized data have been published so far in reference to effective teaching methods particularly for *Shalya tantra* scholars and the fundamentals of quality learning are disregarded. **Discussion and Conclusion:** The best teaching method is the one which arouses the student's interest and in relation to surgical branch, theoretical knowledge is just the base whereas hand-to-hand surgical training must be mandatorily followed to impart the best of skills.

Keywords: *Acharya sushruta*, Hand to hand training, *Shalya tantra*, Teaching methods, *Yogya Asian Pac. J. Health Sci.*, (2023); DOI: 10.21276/apjhs.2023.10.2.07

INTRODUCTION

When we look at the primeval era, India has a rich tradition of learning and education right from the antiquity. Asian population used to prefer India as their choice to achieve a higher level and quality education.^[1] Rapid changes of the modern world gave rise to a variety of challenges for higher education system.^[2] When we talk about teaching methods, both the teacher and scholar are equally significant and the conduct must be in such a way that could make the scholar equally competent in knowledge and skills.^[3]

Ayurveda, the ancient science of life has contributed immense materials in regard to the above said subject in a very structured manner. Starting from *Vaidya gunas* (Quality of a surgeon) to *Shishya guna* (Qualities of a scholar) and systematic approach to attain knowledge has been described in classical literature. The father of surgery, *Acharya sushruta* says a *Vaidya* should possess resolve, courage, memory, good speech, and peace.^[4] *Acharya charaka* also mentioned that a *Vaidya* should be healthy, modest, patient, truthful, skillful, and fearless.^[5] He should have a steady hand, a disciplined mind, and not be boastful of his knowledge. *Sushruta samhita* prescribes the dress code of white or brownish-yellow clothes for the *Shishya* (Scholar).^[6] The modalities of imparting the knowledge of Ayurveda have been changed from divine rank to mankind, from verbal to written documentation. A detailed description of means to attain the knowledge have been discussed by *Charaka* in his book *Charak samhita* which entails *Adhyayana* (Study), *Adhyapana* (Teaching), *Sambhasha parishad* (Discussion with specialists) as the key component of teaching and imparting knowledge. *Adhyana* method of study highlights early morning awakening, getting fresh and taking a bath, greeting all, wear clean fabric, and sit in the proper light and comfortable position to study. To clear own doubts and understand other's weaknesses study with concentration and practice regularly without wastage time. The student must be clean and pure, devoted to the teacher, dexterous, and devoid of drowsiness and

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excessive sleep. After finishing studies, one must make efforts to attain excellence of speech, understanding, boldness, dexterity, practice, and successful management. It is said to give a spotlight on learning with reasoning, specific knowledge, memory, repeated observation, and practical application.^[7] *Adhyapana vidhi* prioritizes about teacher being cool and calm behavior, patience, without arrogance, intellectual, should have confidence for reasoning with good memory, without anger and addictions, purity, good conduct, affection dexterity, sincerity, interested in the study, devoted to understanding of ideas and practical knowledge, no greed and generous nature.^[8] *Sambhasha vidhi* outlines the ways to increase the treasure of knowledge by discussion with colleagues and seniors. It increases the extent of knowledge, intellect, provides dexterity and excellence in speech, enhances understanding the depth of subject, and removes doubt in scriptures. *Shishyaupniya* (Qualities of a capable student) is a core contribution given by *Acharya sushruta* wherein he delineates the code of conduct for scholars, essential intellect and capabilities, excellent personality, positive attitude and to be determined and consistent towards study. Now, the most important question arises here that to develop such *Vaidya gunas* whether the ongoing contemporary methods of teaching are self-sufficient for the scholars of *Shalya* (Ayurveda surgical branch) fraternity or not.

With the aim to enumerate the various methods in reference to *Shalya tantra* and which methodology is best in the present time, this article has been framed after reviewing extensive literature and published work.

METHODS

These data for this study have been synthesized from classical texts i.e., *Sushruta samhita*, *Charaksamhita* and published research articles in PubMed-indexed journals and Google Scholar till November 2022. The strength and lacunae of each of the methodology are identified and discussed here to establish a constructive teaching method for *Shalya tantra* in a systematic manner.

Essential modules which will help to increase the quality of surgical training include classroom approach, socialized classroom method, practical demonstration, simulation education, and hands on training [Figure 1].

Classroom Approach

Education is a process of bringing about a desired change in the behavior of the learner. Education in Ayurveda has rich tradition from the Gurukul system of education to classroom.^[9] Traditional methodology during primeval time~ Gurukul System is an ancient Indian concept of education, where participants get knowledge by residing with their teacher as part of their family. This methodology is totally obsolete in the present time as the rapid modernization has led to more professionalism and education has now become merely a formal gesture. The ancient knowledge has one of the most substantial materials emphasizing all aspects of teaching methods including theoretical and practical demonstration as well as the qualities of a good surgeon. In Medieval era, the popular old-school method where the usage of blackboard and chalk was a thing of prime importance. Although this methodology is still practiced in rural and semi-urban areas of India due to the introduction of advanced methods like projectors, its usage is getting reduced. If we look at the current methodology, because of the establishment of technological advancement and e-learning, the classrooms are well equipped with projectors to ease PowerPoint presentations. Although this method is time-saving, more illustrative, and broader topic can be covered in a short time but it again lacks interactivity and at times slides can be heavily loaded, too many features can get overwhelming, can affect the reputation of teacher if not used correctly.^[10]

Socialized Classroom Method

Many matters written in textbook are confusing and not sufficient to understand properly. In debate, workshop, live demonstration,

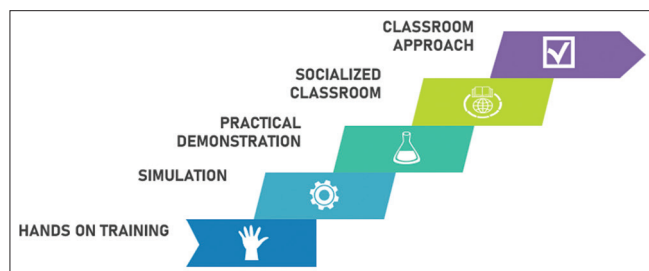


Figure 1: Essential modules which may help to increase the quality of surgical training

and lectures, the smallest queries and doubt are solved. This method is equally important for students as well as teachers. It includes seminars, conferences, and workshops. As a *Shalya* scholar, theoretical knowledge and practical approach need to be updated from time to time. The surgical techniques keep altering often with inception of new innovations and these can be attained only by means of seminars and conferences. Method of operation, operative steps, precautions, complications instructions, arrangement in emergency conditions during procedures may be solved in live demonstrations. The teaching of *Shalya tantra* must be interactive as many of new brain have various ideas which may give new dimensions for further developments. Workshops are more focused on practical demonstration, personal interaction with the learned person. Limited participants ease better understanding, skill learning and one to one doubt solving session makes workshop a distinctive module of learning. However, handling large classes for hands-on practice may be difficult, and ideal resource and resource personnel is usually preferred.

Practical Demonstration

This is the most crucial part of surgical training. Acquiring conceptual knowledge is like an introduction to a full paper and practical demonstration makes us reach till the result of the paper. Its importance was well known by *Acharya sushruta* and hence he mentioned that the person who knows both theory and practical work is capable of obtaining success, in the same way as only two-wheeled vehicles is useful in the battlefield.^[11] Further, he added in *Sushruta samhita* that an inexperienced surgeon fails in practice due to his fear if he has gained only theoretical knowledge.^[12] Students even having studied the entire scripture, should be subjected to practical work.^[13] Intelligent student doing practical work methodically on proper models does not get confused in professional work. Therefore, one should learn and understand the theoretical knowledge and try to clarify it by practical demonstrations, for the expertise in the field of surgery. *Yogya vidhi* (Simulation) is a principal key contribution by *Sushruta* to guide towards approaching such expertise in the *Shalya* branch.^[14] Various models for the practice of surgical techniques have been mentioned namely for *Chedana* (surgical excision), *Bhedana* (incision), *Lekhana* (scrapping and debridement), *Vyadhena* (puncturing), *Eshana* (probing), *Aaharan* (extraction), *Visravana* (drainage), and *Seevana* (suturing).^[15] These are the basic models obtained from natural and animal sources respectively. Nowadays low to high fidelity models are used for simulation training including mock drills to manage emergency conditions in surgery and advanced multipurpose human patient training tool for anesthesia training. Advancement in models using virtual reality technology has been innovated in the form of laparoscopic operation simulators, gastro-endoscopic simulators and for arthroscopic surgeries. Simulation increases scholar's familiarity with certain techniques, increase their clinical performance, decreases potential harm to the patient and helps in achieving competence in a shorter duration. The practical training starts right from outpatient department (OPD), inpatient department to operation theater (OT). In OPD training, history taking enables a scholar to learn the art of correct diagnosis, and thorough clinical examination empowers to assess surgically fit or unfit patients and thus eases the choice of surgical intervention to be opted. In-house training and ward rounds enable the scholar to learn detailed clinical history, perform thorough physical examination, critically

analyse the literature, communicate professionally, apply clinical reasoning, generate differential diagnoses, develop management plan, and learn and perform routine procedures.

Hands-on Training

Hand-to-hand surgical training is the final polishing factor to develop surgical competence and it is a pathway to gain experience. This methodology ensures the active involvement of the scholar reduces pre-operative anxiety and hence makes the student capable to practice independently after being qualified. One of the most salient features of this methodology is that chances of medical negligence become less and in case of such a scenario hand to hand surgical training might help if skill is learned sincerely. The concept of *Agyaupharniya* has been introduced by *Sushruta* back in 1000 BC which traces the theory of *Purvakarma* (Pre-operative), *Pradhana karma* (Operative), *Paschat karma* (Postoperative) which enables a student to learn all the essential components of surgical training including hands-on practice.^[16] In Preoperative Human Factors, anatomy, PAC, identification of instruments, aseptic technique, effective hand-washing and donning of surgical gowns are mastered in OT. During intervention operative Steps, on-table consequences, complications and management can be learned. Postoperatively, knowledge about recovery, early and late complications, and its management can be mastered of. Therefore, this method must be mandatorily taught for the development of surgical leadership competence.

DISCUSSION

Out of all the methodologies, all are equally essential for the progress of a *Shalya* scholar but where and how much emphasis should be given that needs to be acknowledged. *Acharya sushruta* exquisitely interpreted all the methods and it is the duty of today's surgeon to take guidance from them. *Gururkul* system is though obsolete now it was a perfect approach to learn individualized skill and step-to-step dexterity. For understanding of fundamentals and building of pure knowledge, textbooks including classical and modern science are must to refer. However, textual references are updated only in new editions and are a time taking process and tends to lose cost-effectiveness if books are purchased repeatedly. Therefore, socialized classroom methodology comes to the rescue since the smallest queries and doubt can be solved in interactive sessions. Considering practical demonstration, it is necessary to know the basic skill in the clinical presentation of diseases, sign-symptoms, variation, and similarities in different cases, so that easy diagnosis and management may be possible and it plays a great role in higher education of medical students. Group discussion is more beneficial for a group member participating in discussion creates various area of research in related subjects, most economical, and needs minimum infrastructure. The group may be smaller as among student only, or among students and teachers, administrations. Hand-to-hand surgical training is necessary to impart the best of skills and develop surgical competence such as maintaining standards of safety and quality of the procedure, choosing a solution to a problem while making decisions, managing resources, directing clear instructions to the surgical team, instructing and coaching team members according to the goals of the task, offering assistance where appropriate, communicating appropriately for the situation and coping with pressure by showing flexibility and changing in plans if necessary. The best

ideas for effective teaching include teaching methods that focus on the student's task performance rather than just the accretion of facts, opportunities for meaningful personal interaction between the students and teachers, opportunities for collaborative team learning. Hence, this review of the literature reveals the significance of hand-to-hand surgical training which must be included in the curriculum of postgraduate training to *Shalya tantra* along with all the other methodologies and to keep the surgeons updated with new innovations, surgical live demonstration workshops should be conducted and promoted more.

CONCLUSION

A good teaching method should be designed to increase the student's motivation and help student feel confident in solving problems, approach low to high-IQ students for understanding of the subject, give feedback to the students and inform them about their individual learning, help them to carry out self-assessment at the end of each lesson and to encourage the students to motivate them for future work.

A desire for knowledge is the creator of excellence in the work field. Every teacher has his own expert who contributes further to increase the treasure of knowledge, thereby workshop, symposia and conferences are organized to share the experience of skilled person and thus improve our self. Attending group discussion, conferences, and workshops often gives the students a sense of confidence and enthusiasm to do more and more to society and to enrich own knowledge also. Research is also an important component for ideal teaching and training of any system. A learner must have expertise himself in theoretical as well as practical knowledge both to enhance and ensure his merits.

From primeval time, it was found evident that abundant knowledge is given in *Sushruta samhita* which must be attained along with current practice. Effective teaching methods required structural changes in routine academic curriculum which should be more focused on practical orientation and hands on surgical practice.

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