



Original Research Article (Clinical)

A cross-sectional study on the attitude and knowledge assessment of ayurveda teachers, practitioners and students about practical application of *Agadatantra*

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ABSTRACT

Background: *Agadatantra* is one of the eight clinical branches into which Ayurveda medicine is traditionally divided. The term *Agadatantra* is used specifically for the branch of Ayurvedic medicine dealing with poisons, its description, and its antidotes. The other parts of the subject include *Vyavahar Ayurveda* and *Vidhi Vaidyaka* which are comprehensible with forensic medicine and medical jurisprudence of modern medical sciences. Being one of the important subjects during the undergraduate studies of Ayurveda (BAMS), it holds a substantial position in the entire syllabus. The present study was designed to appraise the attitude and knowledge of Ayurveda graduates on the practical application of the subject in day to day professional life.

Materials and methods: It was a cross-sectional study conducted online among the students, teachers, and practitioners of Ayurveda. A pre-validated survey questionnaire was uploaded on GoogleDocs. The sharable link was made available online from 12th November 2018 to 31st Jan 2020 for recording the responses of the volunteers. Analysis of the responses was conducted thereafter.

Results: A total of 2128 participants expressed their opinion through this online survey which evaluated the views of scholars of Ayurveda regarding *Agadatantra* and contemporary allied subjects. Most of the respondents 65.27% were male and 30.83% holding BAMS as their highest qualification, 34.02% were postgraduate (MD) in *Agadatantra*; 55.03% (n = 1171) were academicians and 63.06% participants had an opinion that current UG& PG teaching is not sufficient to know about medico-legal responsibilities.

Conclusion: The survey shows that there are few downsides in the existing teaching methodologies of *Agadatantra*. The existing syllabus should be revised entirely considering it as one of the clinical subjects. Concrete practical based teaching with ample clinical exposure is the need of the hour in the subject of *Agadatantra* to enhance its practical applicability.

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1. Introduction

Agadatantra indubitably is one of the eight clinical branches in Ayurveda [1,2]. It deals with the management of diverse types of poisoning of plant and animal origin with the help of various antidotes and several other treatment modalities. The other branches

coupled with the subject are *Vyavahar Ayurveda* and *Vidhi Vaidyaka*. All three divisions are believed to be studied by each undergraduate student of Ayurveda [3]. It is also available as a subject of postgraduate studies in certain institutes so that students may further pursue it for specialization [4]. The modern counterpart of the subject can be correlated with forensic medicine, medical jurisprudence, and toxicology [5]. Forensic medicine deals with the application of medical knowledge to ascertain evidence in medico-legal cases, such as an investigation into the cause and time of a sudden, suspicious, and unnatural death. Medical jurisprudence is the branch of the law dealing with the application of the law to medicine

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whereas toxicology is the branch of medical science focusing on the nature, effects, detection, and treatment of poisons [6].

In India near about 331 AYUSH institutes have been granted conditional permission for the academic session 2019-20 by the central government under section 13c/13a of the IMCC Act, 1970 for taking admission at undergraduate-level education and more than 100 institutes are having a facility of post-graduation [7]. Undergraduate students and postgraduate scholars both need to study the contemporary sciences to keep their knowledge updated. The present survey study was designed and conducted to gauge the knowledge, analyse the attitude of Ayurveda graduates/post graduates about *Agadatantra* & establish a necessity to bring about a change in the teaching methodology of this subject to enhance its practical applicability in professional life.

1.1. Purpose of the study/objectives

- The survey was conducted to understand the depth of acquaintance in the subject of *Agadatantra* and *Vyavahar Ayurveda* & contemporary medical subject, and to observe the impact of practical or field knowledge amongst the graduates of Ayurveda & postgraduate students of *Agadatantra* and *Vyavahar Ayurveda*.
- Also, to observe its role towards developing attitude or confidence of Ayurveda practitioner while dealing with toxicology and medicolegal cases.
- To record/note attitudes of the participants regarding the changes faced in the overall curriculum of the subject of *Agadatantra* and *Vyavahar Ayurveda* with regards to develop the clinical applicability of the subject.

2. Materials and methods

2.1. Method adopted for the study

It was a cross-sectional study conducted online among the students, teachers, and practitioners of Ayurveda. Considering various aspects related to the assessment of knowledge and attitude on *Agadatantra*, *Vyavahar Ayurveda Evum Vidhi vaidyaka*; a questionnaire was prepared & forwarded to the head of the departments and faculties of *Agadatantra* from renowned institutes over the country for validation.

2.2. Study population

Any Ayurvedic graduate or postgraduates having registered in the respective state or Central Council of Indian Medicine who voluntarily accessed the questionnaire through the link provided from November 2018 to January 2020 was included as the study participant.

2.3. Ethical consideration

The study was accomplished following the e-Health Code of Ethics [10]. The details of the respondents were kept confidential. Participation in the survey was voluntary and data gathered was anonymous.

2.4. Inclusion criteria

All Ayurveda graduates and registered medical practitioners under respective state council and/or Central Council of Indian Medicine; who have studied *Agadatantra* and forensic medicine along with medical jurisprudence and willing to submit the response to the survey were included in the study.

2.5. Exclusion criteria

Volunteers practicing alternative or conventional system of medicine other than Ayurveda, and traditional Vaidyas' who did not acquire any formal education of *Ayurveda* under statutory universities and who are not familiar thoroughly with Forensic medicine and medical jurisprudence were excluded and not considered for the analysis of results.

2.6. Validation of the questionnaire

The validation process of the questionnaire was by distributing it to the 50 faculties of Ayurveda institute viz. R.A. Podar Medical College (Ayu) Mumbai, Government Ayurveda College, Nanded, Maharashtra, and Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University, Varanasi, Uttar Pradesh to ensure that the questionnaire items accurately addressed the research questions to the expected participants to check the level of understanding and to avoid overlooking errors if any related to the formatting of the questionnaire. Corrections suggested by peers were incorporated. The questionnaire was confirmed with internal consistency and reliability availing the online 'Cronbach's Coefficient Alpha' (α) test [8]. The value of alpha was calculated as 0.908 and a total correlation greater than 0.26. Based on the calculated value of 'Cronbach's Coefficient Alpha' which was greater than 0.60 the questionnaire was considered as reliable and acceptable.

2.7. Collection of data

The questionnaire was uploaded on google drive & shared using the link (<https://forms.gle/fjcmi9CaCCgSHKPN6>) among Ayurveda fraternity via a Facebook group (*Ayurveda_Admissions_Jobs_Events*) [9] having around 28 thousand members. The link was also shared through e-mail and *WhatsApp* (Android application) circles of Ayurveda practitioners and academicians. The link was open along with the formal invitation for Ayurveda fraternity to respond to the survey questionnaire from 12th November 2018 on a voluntary basis.

2.8. Statistical analysis

Responses recorded till 31st January 2020 were transformed into Microsoft excel sheet and used for analysis. Results of certain important parameters attained were validated by the Chi-square test (χ^2) and calculation of 'p' value.

3. Results

Over the entire period of the survey during which the link was open for registering the responses, a total of 2128 volunteers responded to the questionnaire. Among them 65.27% were male and 34.73% were female. The mean age of the study participants was 33.90 years and the maximum number of participants were in the age group of 31–40 years (Table 1).

Demographic data also shows that the respondents were almost widely, nevertheless unevenly distributed all over the country. Significant number of participants were from the state of Maharashtra (n = 1017, 47.79%), followed by Kerala (n = 176, 8.27%), Karnataka (n = 150, 7.05%), Gujarat (n = 138, 6.48%) and Uttar Pradesh (n = 107, 5.03%). Respondents from other states were below 100. Least participants were observed from Chandigarh and West Bengal (7 each, 0.33%) and 7 respondents were from abroad.

Table 1
Socio-Demographic characteristics, educational and professional background of the participants.

Sr. No.	Particular		Participants (n)	Percentage (%)
1	Gender	Male	1389	65.27
		Female	739	34.73
2	Age	<20 -30	775	36.4
		31–40	1014	47.7
		41–50	214	10.1
		51 & Above	125	5.87
3	Education	BAMS	656	30.83
		MD (Agada)	724	34.02
		MD (Rasa)	165	7.75
		MD (Dravya)	133	6.25
		MD (Kaya)	127	5.97
		Others	323	15.18
		4	Current Designation	Academician
Practitioner	396	18.61		
Researcher	36	1.69		
PG Student	190	8.93		
UG Student	335	15.74		
5	Teaching Experience	Less than 1 yr.		81
1–5 yr.		318	14.94	
>5–10 yr.		321	15.08	
>10 yr.		451	21.19	
Not Applicable		957	44.97	
6	Teaching Subject	Agadatantra	873	41.02
		Other/Not Applicable	1255	58.98
		7	Satisfaction in Teaching/ learning Agadatantra	Yes
No	105	14.02		
Prefer not to answer	28	3.74		
Not applicable	1379	64.80		

Survey response shows that majority of the participants were holding either only BAMS or MD (Agadatantra) degree as their qualification. Remaining participants were postgraduate in other

Table 2
-Institutional PG Status & Teaching satisfaction and Views on Agadatantra Syllabus, subject benefits, and scope.

Sr. No.	Particular		Participants (n)	Percentage (%)		
1	Affiliated with PG institute in Agadatantra	Yes	693	32.57		
		No	1435	67.43		
2	Autopsy observation visits for UG & PG	Yes	1491	70.07		
		No	478	22.46		
		Prefer not to answer	159	7.47		
		3	Average No. of Autopsies observed	Less than 10	810	38.06
		10–25		600	28.20	
More than 25	81	3.81				
4	Place of Autopsy observation	Medical College	1106	51.97		
		Rural Hospitals	288	13.53		
		PHC& Other	97	4.56		
		5	Court visits for UG and PG students	Yes	1065	50.05
No	856	40.23				
Prefer not to answer	207	9.73				
6	Forensic Science Lab (FSL) Visit for UG & PG students	Yes	972	45.68		
		No	977	45.91		
		Prefer not to answer	179	8.41		
		7	Opinion about present Syllabus and curriculum of Agadatantra	Well Drafted	228	10.71
Needs Minor revision	815	38.30				
Needs Major Revision	736	34.59				
Should be Revised entirely	349	16.40				
8	Opinion about post mortems and Court Visits had educational benefits	Yes		1827	85.86	
No		55	2.58			
May Be		246	11.56			
9		Whether a one-year curriculum is sufficient to complete the syllabus of the subject?	Yes	945	44.41	
No	846		39.76			
May Be	337		15.84			
10	Whether current UG & PG teaching is sufficient to know about medico-legal responsibilities?		Yes	457	21.48	
No		1342	63.06			
May Be		329	15.46			

specialties of Ayurveda including allied subjects such as Rasashastra, Dravyaguna and earlier even Kayachikitsa [11]. Distribution according to profession shows more than half of the participants were academicians followed by the second largest group of practitioners. The remaining participants were either researchers, postgraduate students, or undergraduate students. Among 1171 academicians 41.02% were dealing with the teaching of Agadatantra and among them around ¾ were satisfied with the teaching of the subject. Remaining around 25% were either not satisfied or preferred not to answer the question.

It was also observed that 32.57% of respondents were affiliated to the postgraduate institute (MD) in Agadatantra. Around 70.07% of participants were exposed to autopsy observations during their studies by the concerned institutions. Unfortunately, the average number of autopsies observed were less than 10 for the considerable number of the respondents which were mostly held at local/regional medical collages. Unpredictably, a significant number of survey participants replied that there are no Autopsy, no court visits, and no forensic science laboratory visits respectively during UG/PG Studies at their institutes (Table 2).

Opinions on planning and schedule of the Agadatantra syllabus show that more than 70% of respondents are in favor of minor to major revisions in the current syllabus for undergraduate as well as postgraduate courses. It is expressed the current one-year pattern is not sufficient enough to learn the medicolegal responsibilities by the students.

The present survey study shows that less than 20% of participants could engage themselves in handling medico-legal cases (MLC) at their respective clinics and/or institutes. More than 85% of respondents never conducted the autopsy and more than 70% never issued Medical certification of cause of death (MCCD) in their career; only 6.48% of volunteers attended a court of law in their life. Academic walkthrough of the participants shows that a large number of respondents were neither involved in attending the conferences/CME

Table 3
Implementation of Professional Practices related to Forensic Medicine& Academic Progression.

Sr. No.	Particular		Participants (n)	Percentage (%)	χ ² Value	p Value
1	Do you handle MLC at your clinic/institute?	Yes	384	18.05	974.3	<0.001
		No	1519	71.38		
		Prefer not to answer	225	10.57		
2	Do you issue Medical certification of cause of death (MCCD) at your clinic/institute?	Yes	387	18.19	1119.9	<0.001
		No	1576	74.06		
		Prefer not to answer	165	7.75		
3	Have you ever conducted an Autopsy examination?	Yes	188	8.83	1743.2	<0.001
		No	1817	85.39		
		Prefer not to answer	123	5.78		
4	Have you ever attended a court of law as an Expert witness in any case?	Yes	138	6.48	1916.3	<0.001
		No	1873	88.02		
		Prefer not to answer	117	5.50		
5	Have you ever attended any CME/Conference especially related to <i>Agadatantra</i> ?	No	1187	55.78	1199.7	<0.001
		Yes, Less than 5	714	33.55		
		Yes, more than 5	159	7.47		
		Yes, more than 10	68	3.20		
6	Aware of peer-reviewed research publications available in <i>Agadatantra</i> or FMT	Yes	660	31.02	207.8	<0.001
		No	1468	68.98		
7	Would you like to recommend <i>Agadatantra</i> for postgraduate studies?	Yes	1601	75.23	1138.7	<0.001
		No	274	12.88		
		May Be	253	11.89		
8	Opinion about <i>Agadatantra</i> ?	Non clinical subject	310	14.57	1118.5	<0.001
		Para clinical subject	610	28.67		
		Clinical Subject	1194	56.11		
		Other	14	0.66		

related to *Agadatantra* nor they were aware of the peer-reviewed research journal of *Agadatantra* or Forensic medicine and toxicology. Even though a considerable number of respondents believe that *Agadatantra* is a clinical subject and they would recommend others to pursue post-graduation in the subject (Table 3).

It is also observed that around 53.85% of respondents were aware of traditional Visha Chikitsa Kendra in India and most of them were applying the principles of *Agadatantra* in day to day clinical practice. A similar number of participants were knowing about the Ayurveda medicines which could be used in venomous bite cases, but on the contrary, less than half of them were treating poisoning and venomous bite cases in their clinics or institutes. This might be the reason that around 78.01% of respondents were ready to undergo pieces of training related to the subject if provided (Table 4).

While answering the questions on medical jurisprudence, it was observed that 56.48% of participants were cognizant about professional indemnity insurance for doctors & medical practitioners but it was gloomy to know that most of them (63.16%) were not acquainted with their respective state medical practitioners' acts; and among those who were sensible about the act under which

they were running their clinics, again around 1/3rd of them could not answer the question (Table 5).

4. Discussion

Despite being a clinical branch, present facts about academic exposure and clinical application are not supporting the claim of *Agadatantra*. The implementation of practical exposures of the subject especially in the clinical atmosphere doesn't seem at par with the expectations behind framing its syllabi. The trifling information on recent advances in toxicological and forensic sciences is also one of the reasons for being unfamiliar with the current updates. The questionnaire of the present survey consisted of 34 number of fixed-choice questions and 04 open-ended questions.

The existing survey was designed to focus on the subject of *Agadatantra*, and the link was circulated on the WhatsApp groups commonly shared by *Agadatantra* experts. Therefore, the major participants were specialized in the said subject and might have been more responsible to dominate the other participants.

Table 4
Clinical awareness and Practices in *Agadatantra*.

Sr. No.	Particular		Participants (n)	Percentage (%)	χ ² Value	p Value
1	Are you aware of any traditional Visha Chikitsa Kendra in India?	Yes	1146	53.85	8.43	<0.01
		No	982	46.15		
2	Are you applying the principles of <i>Agadatantra</i> in Clinical practice?	Yes	1064	50.00	206.85	<0.001
		No	615	28.90		
		May be	449	21.10		
3	Are you aware of Ayurveda medicines used in venomous bite cases?	Yes	1234	57.99	36.3	<0.001
		No	894	42.01		
4	Do you treat poisoning and venomous bite cases?	Yes	473	22.23	453.2	<0.001
		No	1655	77.77		
5	Do you know any training center on <i>Agadatantra</i> from India?	Yes	728	34.21	143.0	<0.001
		No	1400	65.79		
6	If given a choice, would you like to undergo any such training?	Yes	1660	78.01	1324.9	<0.001
		No	136	6.39		
		May Be	332	15.60		

Table 5
Awareness about medical jurisprudence.

Sr. No.	Particular		Participants (n)	Percentage (%)	χ^2 Value	p Value
1	Aware of Professional Indemnity for Doctors & Medical Practitioners?	Yes	1202	56.48	23.92	<0.001
		No	926	43.52		
2	Acquaintance with State Medical Practitioners Act.	Yes	785	36.84	99.0	<0.001
		No	1343	63.16		
3	Name and year of formation of State Practitioner's Act.	Answered	580	73.89	123.3	<0.001
		Couldn't Answer	205	26.11		

Academicians seemed to be more concerned and responsible for answering the survey as they might have been in touch with and felt that the topic was more related to them. Consistent updates about the subject certainly makes it more interesting and thereby generating the urge to impart the same to the students. Self-exposure and ample knowledge about several concepts from the subject play an important role when it comes to teaching and, in that way, attaining satisfaction. They seemed to be more satisfied with the teaching of the subject.

As regards to the postings to visualize autopsies, around 70.07% answered positively. It is a good initiative by the Institutes of Ayurveda and their respective Department of *Agadatantra* to organize such educational visits on regular basis and to make sure that all the students are exposed to the methods and objectives of medico-legal post-mortem examinations and its importance in the court of law. But regrettably, several respondents have no such autopsy visits planned by their respective institutes.

Most of the Ayurveda Colleges are not having separate *Agadatantra* clinical ward & autopsy facilities, which results in arranging the visits to nearby medical college; wherein Ayurveda students are not the priority and have limited access to observe the autopsies in the stipulated time. The percentage of negative observations is further noticed concerning organizing court visits and forensic laboratory visits remarkably even though these are supposed to be part of CCIM (Central Council of Indian Medicine) syllabus and supposed to be conducted mandatorily.

As the consequence of lack of visits to court and FSL Labs during their educational years, students tend to have a drought of confidence in the future practices related to the medico-legal cases, issue of MCCD, court witness, and conduction of autopsy procedure. Lacking in any clinical exposure, the subject remains only theoretical for most of the students and even faculties of Ayurveda from several states of the country. The available textbooks on the subject, though not many, merely offer verbatim translation of part from Samhitas and fall short to convey the clinical application thereof in the present scenario. It is becoming progressively more decisive to recognize potential toxicities in the present era and to tackle it with conventional medicines.

In the recent past, the pattern of the syllabus was revised by CCIM and one-year duration was initiated to complete the Ist to IIIrd Profession of BAMS; only IVth Profession remained of one and half year duration. In the present study, it was observed that 44.41% of participants, have believe that the revised one-year duration is sufficient enough to complete the curriculum of *Agadatantra*, remaining 55% were not sure and were unsatisfied with the reduced duration.

The students are usually never involved in the planning or revising of the curriculum of the course and subject including *Agadatantra*. It is, therefore, necessary to know the views of the students while revising the curriculum and to know the best teaching methodology which will facilitate the learning process. It is also important to know the opinion of the students regarding the

best assessment (formative and summative) techniques to measure their knowledge and skills [12].

Further, in the present study, it is strongly noticeable that 63.06% of volunteers believed that merely UG & PG teaching is not sufficient to know about medico-legal responsibilities. The reason for this can be again linked with the length of the curriculum especially in the undergraduate studies and scarcity of actual practical exposure to the students and scholars during undergraduate and postgraduate studies respectively.

A closed-ended question was asked to the participants regarding whether they use to handle medicolegal cases in their clinics/institutes. After considering the individual state medical practitioner's act of most of the states over the country, it was expected that the answers would be negative. Similar kinds of other questions were asked regarding the conduction of autopsy, issuance of MCCD (Medical Certificate for Cause of Death), and presented as an expert witness in the court of law at any moment. In response to all four questions, the majority of the respondents answered 'No' and it was in increasing order. But surprisingly, few participants answered 'yes' to these four questions. Therefore, to analyze the reasons behind these affirmative replies, the data of those volunteers was mined further in connection with the educational, professional, and residential details (State of residence). On scrutiny, it was observed that the majority of the participants with positive reply were MD in *Agadatantra* engaged in academics/clinics including AYUSH medical officers and from the state of Maharashtra.

It is a well-known fact that the educational, professional, and state council act, especially Maharashtra Medical Practitioners Act 1961, is favorable for the matter which is under discussion [13]. But the chances of affirmative responses by the respondents could be tall claims and this can neither be denied nor be neglected. Therefore, further surveys should be conducted after designing a detailed questionnaire seeking precise information.

Continuing medical education (CME) is one of the best platforms for the fraternities who are in the medical field to preserve their competence and acquire newer developments in their respective arenas. CME usually are organized as live and in person contact events. It can be further developed in the form of circulations of written periodicals, online programs such as webinars, audio, video, or other forms of electronic media. The present study shows that merely 44% of participants had attended CME related to *Agadatantra* and contemporary medical science during their UG/PG studies or in their professional careers. Among those affirmative responses, unfortunately, again large numbers have had attended less than 5 such CME. It can be noted that there is a lack of interest in attending CMEs & conferences among the Ayurveda graduates and practitioners. Implementation of gradations and credit points for attending CMEs in concerned subject or conferences might help and motivate people to attend such CME. Moreover, imparting practical sessions on clinical training in the

subject through CMEs may attract students and practitioners to attend the same.

The majority of the survey participants are not cognizant about available peer-reviewed research journals published in the subject of *Agadatantra* or Forensic medicine and Toxicology. It further drags the individual away from the facts and current updates of the subject and also results in non-publishing of research articles, case studies, reviews on the appropriate platform. Even though there are few reputed indexed research journals on Toxicology and Forensic medicines, there is no distinct journal dedicated to *Agadatantra*. The experts, national authorities, and associations of *Agadatantra* should consider it as a scope and efforts should be made to publish the subject-specific journals.

With regards to knowledge of treating the poisoning cases, the majority of affirmative responses were from the state of Maharashtra followed by Kerala and Karnataka, majority among them holding post-graduate degrees in *Agadatantra*. It is also obvious that around 57.99% of respondents were aware of medicines in Ayurveda which are to be indicated in venomous bite cases. The reason behind increased negative responses to this statement could be the after-effects of medicolegal issues and limitations in clinical practice while handling the poisoning cases abiding the respective State medical practitioners act. The number of poisonous bite cases in a region also matters. It is obvious to come across such cases more frequently in rural than in urban areas.

With regards to the application of principles of *Agadatantra* in clinical practice, 50% of the respondents replied positively. On further scrutiny, it was also noted that the majority of them were from the state of Maharashtra followed by Karnataka and Kerala. These are the three states where *Agadatantra* is practiced more at liberty than the other states across the country. In southern India, especially in the state of Kerala and Karnataka, *Agadatantra* always remained a highly decorated and imperative subject providing profuse exposure of clinical experiences to their disciples. Nowadays it is a trend in the nearby states, particularly from Maharashtra that the postgraduate students of *Agadatantra* are posted for the clinical exposures in certain traditional Visha Chikitsa Kendras from Kerala. Such practices are believed to be more beneficial and serve to boost the confidence of the scholars in day to day clinical practices. This might be one of the reasons for outstanding positive replies.

The study also discloses that $\frac{3}{4}$ respondents are recommending the subject for postgraduate studies. Adding to this, similar number of volunteers are willing to undergo the explicit training in *Agadatantra*. This indicates the huge belief and ample scope of the subject which can be chosen as a career in the further profession.

Professional indemnity insurance policy for doctors and medical practitioners is meant to cover liability dwindling on them as a result of errors and omissions committed by them while executing professional services. It is beneficial for each practitioner to cover the financial loss that occurred due to the damage of the property during unexpected assaults by the relatives of the patients. In the present study, 56.48% of responses show that they were aware of such an insurance coverage. But the remaining 43.52% of Ayurveda graduates did not know about such insurance benefits. Awareness about such Professional indemnity insurance policies should be increased among all Ayurveda workforces for the personal and professional assistance.

In the present study, it was shocking to learn that only 36.89% of contributors were acquainted with the respective State Medical Council and Practitioners act. The other group of the participants was (63.16%) unversed with it. Adding misery further, out of 785 volunteers who answered 'Yes' and claimed that they are aware

about the State Medical Council and Practitioners Act, only 580 could answer the name and year of formation of Act in the subsequent question; whereas, 205 participants remained silent. It seems that not knowing the name and year of establishment of State Medical Practitioners act might have become the issue of prestige and self-esteem; therefore, even after not knowing the precise information, 205 participants answered 'yes' to the earlier question and details in the later question remained unanswered which is clearly a negative finding.

4.1. Suggestions for improvement of the subject

During postgraduate studies i.e. M.D. (*Agadatantra*), apart from classroom teachings and conservative methods of treatment, scholars should also be exposed to clinical emergencies in the casualty, such as cases of acute poisoning involving medico-legal issues and its management. In case of unfortunate mortalities during such incidences, the scholars should also be engaged in medico-legal autopsies and court visits to understand its forensic as well as legal components. Periodic and active attendance in the national and international conferences/workshops related to the subject would certainly help to keep oneself updated with the current amendments. Rigorous researches in the field of toxicology and Opening newer and advanced fields based on the subject would help to create more job opportunities and thereby increasing the demand of the experts.

Newer techniques involving the internet, electronic journals, educational videos need to be incorporated in the teaching methodologies of *Agadatantra* to make it easier to gain full of knowledge on the subject, irrespective of the availability of proper means in individual institutions. The focus should also be on the exposure of ample clinical/practical aspects of the subject to the students for their benefit [14].

Efforts should be made towards the establishment of more training centers imparting practical clinical education in identifying exposure to different toxicities and their management by Ayurveda principles.

Ayurveda graduates and experts should work unanimously for the development of strategies and futuristic plans to explore the newer techniques which are required to be implemented with active initiation by concerned Ayurveda academicians as well as experts of *Agadatantra* for the furtherance of the subject towards a clinical branch.

4.2. Limitations of the study

1. The survey questionnaire was shared online via an open link into the groups of Ayurveda graduates, academicians, and the practitioners. All members of the groups were free to respond to the survey at their will and therefore there was no control over the selection of the respondents and their randomization.
2. Because of large variations in the category of respondents in terms of their professional and academic background, there are limitations in the generalizations of the results.
3. A considerable number of questions were focusing on the assessment of knowledge of the participants on 'Vyavahar Ayurveda Evum Vidhivaidyaka' component of *Agadatantra*; therefore, the information about the 'Ayurveda Toxicology' remained limited.
4. A significant number of the participants were from the single state of Maharashtra, due to which the overview of the results remains limited. A similar study involving the participants selected randomly and representing all the states of the country might be helpful to further substantiate the results.

5. Conclusion

The present survey shows that there are few downsides in the existing teaching methodologies of *Agadatantra*, which is wrenching it back. It is also observed that the majority of the participants are unaware of the developments in the subject and recent amendments in the rules and regulations related to their respective State medical practitioners act. Even though it is believed that *Agadatantra* is a clinical subject, the majority of the participants neither dare to treat the cases of poisoning on their own nor handle the medico-legal cases at their respective clinics. Concrete practical based teaching with ample clinical exposure is the need of the hour in the subject of *Agadatantra* for its escalation.

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Conflict of interest

None.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jaim.2020.10.007>.

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