

ASSESSMENT OF COGNITIVE AND PSYCHOMOTOR CHANGE FOLLOWING COMPETENCY BASED LEARNING AMONG INTERNS IN A MEDICAL COLLEGE OF KARNATAKA

Kirankumar Akka¹, Vinod Prabhushetty², Pallavi Tenglikar³, Roopa R Mendagudali⁴

Received : 02/06/2023
Received in revised form : 07/08/2023
Accepted : 19/08/2023

Keywords:

Cognition; psychomotor skill, competency based learning; assessment; Objective structured practical examination.

Corresponding Author:

Dr. Roopa R Mendagudali,
Email: drrooparm@gmail.com

DOI: 10.47009/jamp.2023.5.4.328

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2023; 5 (4); 1650-1653



¹Associate Professor, Department of Biochemistry, M R Medical College, Kalaburagi, Karnataka, India

²Associate Professor, Department of Physiology, M R Medical College, Kalaburagi, Karnataka, India

³Associate Professor, Department of Community, Medicine M R Medical College, Kalaburagi, Karnataka, India

⁴Assistant Professor, Department of Community, Medicine M R Medical College, Kalaburagi, Karnataka, India

Abstract

Background: The learning during internship happens most of the times is self-directed and self-motivated. Competency based learning focuses on the skills required for good medical practice and appropriate assessment of clinical competencies forms an integral part. It is usually found that Indian medical graduates are not competent and confident enough even at the end of their internship. Hence the study was conducted to assess cognitive and psychomotor change following competency-based learning in medical interns. **Materials and Methods:** An educational interventional study was conducted among 40 interns posted at urban health center of a medical college. IRB institution name: HKE Society's Mahadevappa Rampure Medical college, Kalaburagi, approval number:190302 and approval date: 20/03/2019. The baseline cognition was assessed using Pretest questionnaire followed by training session and demonstration of steps of preparation of ORS. The psychomotor skill of preparation and demonstration of ORS was assessed by 3 station Objective structured practical examination with checklist after giving sufficient time for discussion and practice. Posttest and feedback were taken. Data was analyzed in terms of frequencies, mean and standard deviations, paired t test. **Result:** The study reported significant improvement in cognition ($p=0.000$) and total mean (\pm SD) score of OSPE were 18 (\pm 2.4). The mean scores of feedback (4.3 ± 0.5 to 4.7 ± 0.5) were suggesting most of the interns agree that Competency Based Learning was effective and OSPE is acceptable as method of assessment in interns. **Conclusion:** The study revealed significant improvement in cognitive and psychomotor skills of the interns following training. This suggests need of orientation towards competency-based training among interns too to acquire core skills to reduce fatality due to preventable causes like dehydration.

INTRODUCTION

In medical education 'Internship' is a structured period wherein a Indian medical graduate [IMG] is in training transit to learn actual practical aspects of medical & health care and acquire skills under supervision to become capable of functioning independently and assume clinical responsibility which can be challenging.^[1,2] The interns are all under huge pressure: highly demanding working hours, less satisfactory pay and a need for ongoing learning and assessment. The critical element here is the gaining of specific experience and skills by the

intern.^[3] It has been observed that successive generations of IMGs are having low confidence for practice of their profession independently in the society.^[4] The important reason is lack of hands on training, monitoring and evaluation system which can facilitate the interns to achieve the desired competence.^[5] Competency based learning focuses on the skills required for good medical practice and it provides standards and framework for measuring performance. However, it is still not widely used in internship. Along with changes in teaching methodology, assessments need to adapt to the teaching-learning process.^[6] Conventionally after

completion of compulsory rotatory internship in the various departments, the interns will be assessed and certified depending on the record of work maintained in the log book (Satisfactory completion certification), which used for verification.^[1,7] An appropriate assessment of the competencies forms an integral part in the medical curriculum and had been undergoing a revolution in the previous half a century.^[8] Assessment of students at regular intervals is a source of learning and providing the basis for enhancing the competence level.^[9] It is difficult to assess knowledge, comprehension, skills, motivation, and feedback using single method. In such settings, “in-training” skill-based assessments are of importance in addition to knowledge-based tests. The problems of inadequate reliability due to lack of standardization, limited observations and limited sampling of skills are cause of concern in such kind of assessments.^[10]

The Objective Structured Practical Examination (OSPE) can assess practical competencies in an appropriate, step-wise, methodical and time-orientated manner with direct observation of the student’s performance during planned practical test stations.^[9] OSPE pattern holds transparency in proper assessment of students rather than being subjective. The chief benefits of OSPE include objectivity, reliability, and good capacity for discriminating between different categories of students and structured in such a way that all the objectives of a procedure are met.^[7] Currently, in India, OSPE is conducted as a formative or summative examination during various phases of MBBS, and allotted an insufficient percentage of the marks and not being used for assessing interns while certifying them in log books.^[8,11,12]

Introduction of oral rehydration therapy by World Health Organization has established a safe and successful appropriate technology for treatment of all types of dehydration, all age groups and all countries with a aim to reduce mortality even at primary health care level.^[13] It is one of the social needs expected from Indian medical graduate is to be competent enough to manage patient presenting with dehydration with appropriate technology like oral rehydration solution (ORS) which is safe and successful. Thus preparation and use of ORS being must to know competency, it was chosen OSPE.^[14]

It is usually observed that whatever has been learnt during MBBS course is not been practiced confidently. Hence, the present study was conducted to assess cognitive and psychomotor change following competency-based learning in medical interns using the preparation ORS as competency.

MATERIALS AND METHODS

An educational interventional study was conducted in an urban field practice area of M.R. Medical College, Kalaburagi. After obtaining the institutional ethical clearance and informed consent from 40 study

participants, study was carried out over a period of 5 months from 1st Nov 2018 – 31st Mar 2019 to a batch of interns who was be posted in the department of Community Medicine. All the interns posted during study period at UHTC, Rajapur, who gave consent for study was included in the study.

The interns were notified three weeks in advance regarding the plan for conducting the practical assessment by OSPE. Detailed instructions regarding the OSPE, number of stations, and marks for each station were displayed. The pretest and post-test questionnaire consisted of Multiple-Choice Questions (MCQs) to assess knowledge and an OSPE to assess knowledge and practice of usage ORS. The questionnaire was constructed having 25 MCQs in a way to include the self-assessed confidence level in various aspects of managing a child presenting with dehydration such as all basic theoretical aspects of oral rehydration salts, identification of signs of dehydration, management of dehydration using ORS preparation and the adequacy of training during undergraduate period and internship. Followed by pretest, students were trained with 1 hour session of lecture method using power point presentation and flowcharts. The content of the lecture was on details of types, composition and steps in the preparation of ORS, assessing the degree of dehydration and its management using ORS. Demonstration method was used to teach the steps in preparation of ORS solution.

All the four faculties who were trained in medical education technology conducted the study. The faculty and students were sensitized regarding OSPE which assesses the “shows how” level of Miller’s pyramid of competence.⁹ In OSPE the student was asked to perform a task and is evaluated using a standardized checklist. OSPE was used each station was designed along with the checklist, by the authors. A total of 3 stations were made one for identifying the signs and symptoms of dehydration, second for following the correct steps of preparation of ORS and the third demonstration of steps of preparation of ORS to the subjects (e.g., mother of under-five dehydrated child).^{13, 15} The duration for each station was five minutes. Checklist was prepared for each station separately & validated by 2 senior faculties.

Each point on the check list was scored according to the binary system, that is, the ‘Yes/No’ scale, by the observer, and marks were given accordingly. Students required 50% marks to pass both types of tests. Feedbacks from the interns were recorded on a 5-point scoring with the help of a pre-validated questionnaire. Student’s feedback towards training is of importance in undergraduate medical education as it has significant effect toward more efficient teaching. The interns were reassessed with the post-test consisting of same 25 MCQs pretest to assess knowledge and practice. [Figure 1]

Data was analyzed using IBM SPSS version 20 software. Paired t test was used to assess pre and post

test scores. Frequencies, mean and standard deviation for OSPE and feedback questions were calculated.

RESULTS

The study was conducted in 40 interns posted at urban health center of a medical college. The mean age group of the participants was 22 ± 0.6 years and gender wise, 47.5% were male, and 52.5% were female. The mean scores of change in cognition were 18.05 ± 2.4 and 22.1 ± 1.8 for pre and posttest respectively and there was significant difference between the pre and post test scores ($p = 0.000$). [Figure 2] The post test score among males (22.9 ± 1.7) and females (21.5 ± 1.7) showed significant difference ($P=0.000$).

The mean scores of all the 3 station revealed above 50% marks for each station and the cumulative mean score obtained in OSPE was 18 ± 1.5 . [Figure 3]

It was evident from the feedback that most of the students agree to strongly agree that training was effective and assessment using OSPE was a better learning stimulus. 61% of the study participants agree that OSPE motivates for self-directed learning, 56% agree that OSPE helped in memorizing the points quickly and retention of knowledge, 58% students agree that OSPE helped me to find my basic learning needs, 57% agree that OSPE helped introspect deficiencies in my clinical skills and 61% agree that OSPE helped in clinical decision making. The cumulative mean scores of feedback were ranging from 4.3 ± 0.5 to 4.7 ± 0.5 . [Figure 4 and 5].

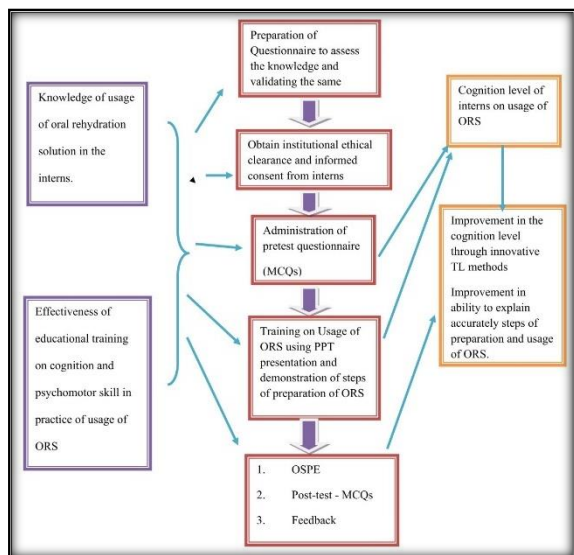


Figure 1: Study protocol

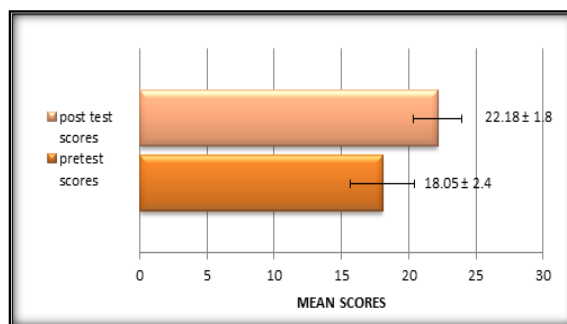


Figure 2: distribution of scores of Knowledge

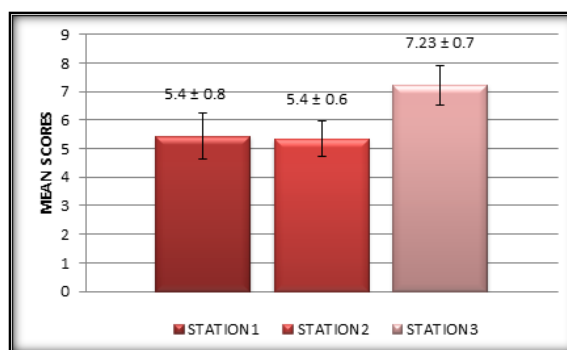


Figure 3: Distribution of scores of all the station OSPE

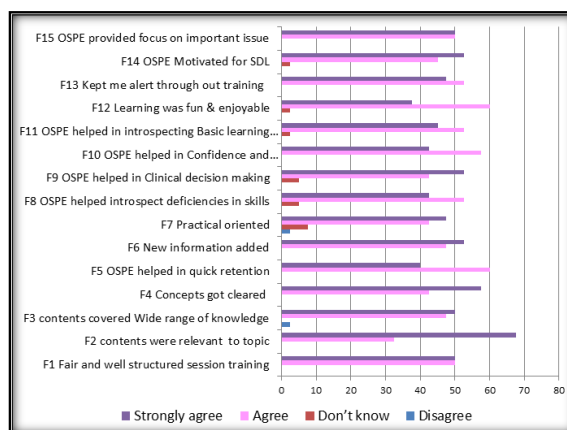


Figure 4: frequency distribution of FEEDBACK questions

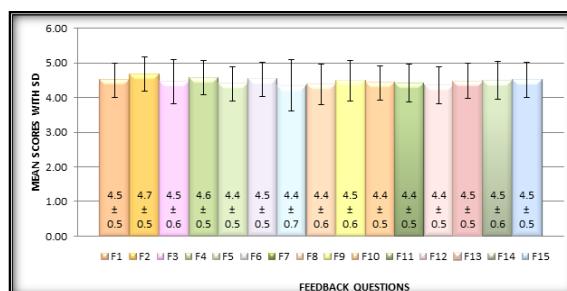


Fig 5: Distribution of scores of feedback questions

DISCUSSION

The present study was an attempt towards competency-based learning and assessment of cognition and psychomotor skill among the interns using OSPE which is more objective and unbiased and was introduced for the first time to make them

practical oriented. However, several studies have shown it to be an effective tool for assessment among various phases of MBBS especially for the practical assessment of preclinical and para clinical subjects among the medical students.

Majority of the students reported improvement in knowledge post competency based training and male interns showed significant higher cognition change ($p = 0.000$). This suggests that for the present group of interns who were trained in the traditional curriculum, an extra training which is competency based during internship was beneficial. The improvement in their performance level was observed by majority of interns through OSPE and it was helpful in better understanding of the subject. The results suggest that OSPE can be introduced to certify some of the practical skills which an intern must perform independently. The reason being out the conventional certification in the log book was based on subjective scores given for some of the individual and team activities performed in the wards. The participant's feedback supports the effectiveness of training and further supports OSPE as a good choice of practical assessment. Similarly, it also makes the student think more critically and covered a broad range of knowledge.

Similar study reported by Sindhu TG et al that post test scores for knowledge were significantly higher (p value <0.01) post competency-based training workshop and the feedback supported good acceptance of the training workshop and programs very useful. She also reported regular training workshops can be conducted during internship to improve their competencies.^[14]

Gaikwad MM et al conducted to assess the knowledge of interns regarding the dosage forms and their administration techniques among interns reported that theoretical knowledge was not sufficient and Very Few interns could demonstrate correct administration techniques suggesting emphasis on such exercises in curriculum.^[15,16]

The study on educational interventions to improve knowledge and skills of interns towards prevention and control of hospital-associated infections (HAIs) conducted by Dogra S et al reported from that there was highly significant improvement in the HAIs associated knowledge and skills as assessed by OSPE. Nearly 90% of the interns showed workshop satisfaction.^[17]

These all studies support the present study findings and support for the need to relook into the existing medical curriculum.

CONCLUSION

The study reported that there was significant improvement in cognition level and psychomotor skills of the interns following training suggesting the

need of competency based training of interns to acquire core skills like managing preventable causes like dehydration. The study suggests that there is need to introduce regular competency based learning sessions during internship covering must to know areas for medical practice. The completion of internship may be acknowledged with the appropriate assessment of the skill level such as OSPE instead of traditional way of only through log book validation. Further various other methods of clinical competency assessment such as OSCE, 360 degree evaluation, mini CEX also to be integrated to assess the medical interns making them more confident in their future clinical practice.

REFERENCES

1. Medical Council of India. Salient features of regulations on graduate medical education, 1997. The 4th March 1997 notification. Accessed on 05-05 2023 and available from <https://www.nmc.org.in/rules-regulations/graduate-medical-education-regulations-1997/>
2. National Medical Council. National Medical Commission Notification New Delhi, The 18th November, 2021. Accessed on 05-05 2023 and available from <https://www.nmc.org.in/MCIRest/open/getDocument?path=/Documents/Public/Portal/LatestNews/231280.pdf>
3. Zhao Y, Musitia P, Boga M, Gathara D, Nicodemo C, English M. Tools for measuring medical internship experience: a scoping review. *Human Resources for Health*. 2021 Dec;19(1):1-2.
4. Sukhlecha A. Medical internship: Is it a "one year paid leave" for postgraduate entrance examination preparation?. *Med J DY Patil Univ* 2016;9:706-7
5. Giri PA, Parhar GS. Internship: A transition from a medical student to a doctor. *Int J Biomed Adv Res* 2012;3:753-5.
6. Teixeira LC, Pellis IC, Prado MR. Competency-Based Education in Medical Internship: Integrative Review. *Journal of Education and Training Studies*. 2020;8(7):35-41.
7. Goyal RC, Choudhari S & Tankhiwale S. Assessment of Competency based Medical Internship training with 'Cumulative Grade Points Average system'-An Innovative step towards Meeting 'Vision 2015' of Medical Council of India August 2018 *Indian Journal of Public Health Research and Development* 9(8):155
8. Baral BK. Objective Structured Practical Examination: comparison with the traditional practical examination and students' perception. *Nepal Med Coll J* 2017; 19 (2): 84-89
9. Wani PD. Traditional clinical examination vs objective structured practical examination in human physiology: Examiner's bias. *Int J Med Sci Public Health* 2015;4:607-611
10. Al-Wardy NM. Assessment methods in undergraduate medical education. *Sultan Qaboos Univ Med J*. 2010 Aug;10(2):203-9.
11. Supriya D, Malhotra, Kartik N, Shah, and Varsha J. Patel. Objective structured practical examination as a tool for the formative assessment of practical skills of undergraduate students in pharmacology *J Educ Health Promot*. 2013; 2: 53.
12. Relwani NR, Wadke RA, Anjenaya S, Sawardekar PN. Effectiveness of objective structured practical examination as a formative assessment tool as compared to traditional method for M.B.B.S students. *Int J Community Med Public Health* 2016;3:3526-32.
13. K Park. Park's Text Book of Preventive and Social Medicine. Banarasidas Bhanot publishers, Jabalpur 26th Edition 2021:p 258-60.
14. Sindhu TG, Geeta MG, Geetha P, Fiji MD. Effectiveness of a training workshop on perceptions and practice of interns in management of acute diarrheal diseases in children. *Int J Contemp Pediatr* 2018;5:p 857-61.
15. How to make oral rehydration solution (ORS). Last viewed on 10/05/2023 Available from: https://www.cdc.gov/cholera/pdf/posters/11_229310-J_ORIS_print.pdf
16. Gaikwad MM, Dabhade SS, Jagtap RP, Ghongane BB. A survey of knowledge of interns about the instructions given to the patients while prescribing various dosage forms. *Med J DY Patil Univ* 2016;9:701-6
17. Dogra S, Mahajan R, Jad B, Mahajan B. Educational interventions to improve knowledge and skills of interns towards prevention and control of hospital-associated infections. *Int J Appl Basic Med Res*. 2015 Aug;5(Suppl 1):S54-7.