



ASSESSMENT OF CLINICAL COMPETENCIES AMONG MEDICAL INTERNS AT A TERTIARY CARE HOSPITAL IN KONASEEMA INSTITUTE OF MEDICAL SCIENCES & RESEARCH FOUNDATION, AMALAPURAM, ANDHRA PRADESH.

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ABSTRACT

Background: The assessment of medical interns' clinical competencies is essential to ensuring their preparedness for independent practice. Competency-Based Medical Education (CBME) focuses on structured training and supervision to enhance procedural skills. This study evaluates the competencies of interns at the Konaseema Institute of Medical Sciences (KIMS), Amalapuram, India, in performing clinical procedures and their confidence in diagnosing common diseases. **Methods:** A cross-sectional study was conducted among medical interns at KIMS. Data were collected using a pre-tested questionnaire distributed via Google Forms. Competencies in blood sampling, clinical examinations, wound management, surgical procedures, and emergency care were assessed. Data were analyzed using IBM SPSS version 20, employing descriptive and inferential statistics, including the chi-square test. **Results:** Most interns performed venous blood withdrawal (78%) and arterial blood gas sampling (50%) independently under supervision. High proficiency was observed in intramuscular injection (95%) and bladder catheterization (92%), whereas complex procedures like episiotomy suturing (21%) and endotracheal intubation (20%) had lower independent performance rates. A significant association ($p=0.038$) was found between internship posting attendance and confidence in diagnosing common diseases, with 79% of interns reporting confidence. **Conclusion:** The study highlights variability in interns' procedural competencies, with basic procedures being performed more independently than complex ones. Increased clinical exposure, structured supervision, and targeted training are recommended to enhance competency in advanced procedures. The findings support the need for continuous assessment and refinement of CBME programs to ensure comprehensive skill acquisition.

KEYWORDS : Medical interns, internship training, clinical skill assessment, procedural competency, blood sampling, wound management, emergency care, medical education.

INTRODUCTION

The evaluation of medical interns' abilities is a critical aspect of medical education, ensuring that graduates are adequately prepared to handle clinical responsibilities. Competency-based medical education (CBME)¹ emphasizes the development of practical skills, such as blood sampling, wound management, and emergency care, under supervised conditions to bridge the gap between theoretical knowledge and real-world practice. Institutions like the Konaseema Institute of Medical Sciences (KIMS) in Amalapuram, India, have adopted CBME to train interns, aligning with global trends in medical education that prioritize observable and measurable skills. Studies worldwide have assessed interns' competencies in various clinical procedures, reflecting the importance of structured training and supervision in achieving proficiency.

Recent research highlights variability in interns' skills across different institutions and regions, influenced by training duration, supervision quality, and exposure to clinical scenarios. For instance, a study by Acosta et al. (2018)² emphasized the role of supervised practice in enhancing surgical skills among interns, while Krajewski et al. (2013)³ underscored the importance of competency assessments in addressing gaps in clinical performance. In India, the implementation of CBME by the National Medical Commission (NMC) has prompted institutions to evaluate interns' abilities systematically, as seen in works by Kuppili et al.⁴ (2022). This study at KIMS Amalapuram contributes to this body of knowledge by assessing interns' competencies in blood sampling, clinical examinations, wound management,

and emergency procedures, providing a localized perspective within a rural tertiary care setting.

MATERIALS AND METHODS

Study Design: A cross-sectional study was conducted.

Study Participants: The participants were students from Internship

Study Setting The study was carried out at Konaseema Institute of Medical Sciences & RF, Amalapuram, Andhra Pradesh.

Sample Techniques: Convenient sampling

Inclusion Criteria: Interns with a minimum attendance of 60% or above were included in the study.

Exclusion Criteria:

1. Students who were unwilling to participate in the study were excluded.
2. Students who had attempted fewer than three formative assessments were also excluded.

Ethical Consideration: Institutional ethics committee approval was taken and informed consent was obtained.

Data Collection: Data collection was done using pre tested & pre structured questionnaire. Google forms were sent to all students and asked to be filled.

Data Analysis And Interpretation:- Data was entered using a Microsoft Excel 2016 spreadsheet. Summarization and analysis of data were carried out by using IBM SPSS Software version 20 (licensed). Descriptive Statistics: Frequency, Percentage. Inferential Statistics: Chi-square test.

RESULTS

Table 1: Distribution Of Medical Students Competency In Blood Sampling And Clinical Examinations

Variables		Frequency	Percent
Venous blood withdrawal for investigation	Not observed	4	4.0
	Observed	18	18.0
	Performed Independently under supervision of consultant	78	78.0
Sample collection for Arterial blood gas	Not observed	2	2.0
	Observed	48	48.0
	Performed Independently under supervision of consultant	50	50.0
Pap smear sampling	Not observed	11	11.0
	Observed	59	59.0
	Performed Independently under supervision of consultant	30	30.0
Digital rectal examination	Not observed	4	4.0
	Observed	67	67.0
	Performed Independently under supervision of consultant	29	29.0

Table 2: Medical Students' Proficiency In Wound Management And Surgical Procedures

Variables		Frequency	Percent
Lacerated wound suturing	Not observed	1	1.0
	Observed	10	10.0
	Performed with assistance	46	46.0
	Performed Independently under supervision of consultant	43	43.0
Episiotomy wound suturing	Not observed	7	7.0
	Observed	26	26.0
	Performed with assistance	46	46.0
	Performed Independently under supervision of consultant	21	21.0
Incision and drainage of abscess	Not observed	2	2.0
	Observed	21	21.0
	Performed with assistance	57	57.0
	Performed Independently under supervision of consultant	20	20.0
Endotracheal tube intubation	Not observed	2	2.0
	Observed	35	35.0
	Performed with assistance	43	43.0
	Performed Independently under supervision of consultant	20	20.0

Table 3: Medical Students' Skills In Injections,

Catheterization, And Emergency Care

Variables		Frequency	Percent
Intramuscular injection	Observed	5	5.0
	Performed Independently under supervision of consultant	95	95.0
Bladder catheterization	Observed	8	8.0
	Performed Independently under supervision of consultant	92	92.0
Nasogastric tube insertion	Observed	13	13.0
	Performed Independently under supervision of consultant	87	87.0
Cardiopulmonary resuscitation	Observed	11	11.0
	Performed Independently under supervision of consultant	89	89.0
Intravenous injection	Observed	10	10.0
	Performed Independently under supervision of consultant	90	90.0

In the present study out of 100 study participants 58 are male (58%) and 42 were female (48%), majority of subjects belong to the age group of 18-25 years i.e.(87%) and least group of age 25-28 years i.e.(13%). Most interns attended 80-90% of their postings while a similar attended more or less.

Present study showing that, for venous blood withdrawal, a small proportion (4%) did not observe the procedure, while 18% observed it, and the majority (78%) performed it under the supervision of a consultant. Similarly, for arterial blood gas sample collection, 2% did not witness the procedure, 48% observed it, and 50% carried it out independently under supervision.

In the case of pap smear sampling, 11% did not observe it, whereas 59% did, and 30% performed it under supervision. Digital rectal examination followed a similar trend, with 4% not observing, 67% observing, and 29% performing it under guidance. Lacerated wound suturing had 1% who did not observe, 10% who observed, 46% who performed with assistance, and 43% who performed it independently with supervision. Episiotomy wound suturing showed that 7% did not observe the procedure, 26% observed, 46% performed it with assistance, and 21% executed it independently under supervision.

For incision and drainage of an abscess, 2% did not observe, 21% observed, 57% performed it with assistance, and 20% conducted it independently with supervision. Endotracheal tube intubation was not observed by 2%, while 35% observed it, 43% performed it with assistance, and 20% carried it out under supervision.

Regarding simpler procedures, intramuscular injections were observed by 5%, while 95% performed them independently under supervision. Similarly, 8% observed bladder catheterization, with 92% performing it independently. Nasogastric tube insertion was observed by 13%, while 87% carried it out under supervision. Lastly, cardiopulmonary resuscitation (CPR) was observed by 11%, and 89% performed it independently with guidance.

Table 4: Association Between Internship Posting Attendance And Confidence In Diagnosing Common

Diseases

	During your internship, what proportion of postings did you attend?						
How do you feel in diagnosing common diseases or conditions?	60-70%	70-80%	80-90%	> 90%	Total	Chi square	Pi
Very confident	0(0.0%)	1(1.0%)	1(1.0%)	0(0.0%)	2(2.0%)	17.760	0.038
Confident	2(2.0%)	29(29.0%)	44(44.0%)	4(4.0%)	79(79.0%)		
Neutral	0(0.0%)	5(5.0%)	4(4.0%)	4(4.0%)	13(13.0%)		
Not confident	1(1.0%)	1(1.0%)	2(2.0%)	2(2.0%)	6(6.0%)		
Total	3(3.0%)	36(36.0%)	51(51.0%)	10(10.0%)	100(100%)		

The table presents data on the confidence levels of interns in diagnosing common diseases or conditions, categorized based on the proportion of postings they attended during their internship. The confidence levels are divided into four categories: "Very confident," "Confident," "Neutral," and "Not confident." The highest percentage (79%) of interns reported feeling "Confident," with the majority (44%) having attended 80-90% of their postings. A smaller percentage (13%) remained "Neutral," while 6% of respondents felt "Not confident." Only 2% of interns reported feeling "Very confident." The statistical analysis includes a chi-square value of 17.760 and a p-value of 0.038, suggesting a significant association between the proportion of postings attended and the level of confidence in diagnosing diseases.

DISCUSSION

For venous blood withdrawal, the study revealed that 78% of students performed the procedure independently under supervision, while only 4% had not observed it. This high level of hands-on experience aligns with the findings of Acosta et al. (2018)², who reported that structured surgical skills curricula significantly enhance interns' confidence and competence in practical procedures like venipuncture. Their study emphasized the importance of supervised practice, which is mirrored in the present study's high percentage of supervised independent performance. Similarly, arterial blood gas sampling showed 50% of students performing it independently under supervision, a finding consistent with Singh and Nagmoti (2021)⁵, who noted that repeated exposure to clinical microbiology skills under supervision fosters skill acquisition among undergraduates. However, the 48% who only observed arterial blood gas sampling suggests a potential gap in hands-on training opportunities compared to venous sampling, possibly due to the procedure's complexity or limited clinical exposure.

In wound management and surgical procedures, lacerated wound suturing saw 43% of students performing independently under supervision, while 46% required assistance. This distribution is comparable to Krajewski et al. (2013)³, who found that interns participating in a boot camp curriculum demonstrated improved proficiency in suturing under supervision, with many transitioning from assisted to independent performance over time. However, for episiotomy wound suturing, only 21% performed independently under

supervision, with 46% still requiring assistance. This lower independence rate may reflect less frequent exposure to obstetric procedures, as suggested by Acosta et al. (2018)², who noted variability in skill acquisition based on specialty-specific opportunities during training. The incision and drainage of abscesses (20% independent under supervision) and endotracheal intubation (20% independent under supervision) further indicate that more complex procedures may require extended training periods, a point echoed by Herren et al. (2023)⁶, who advocated for advanced resuscitation courses to bolster competency in critical procedures like intubation.

Regarding simpler procedures such as intramuscular injections (95% independent under supervision) and bladder catheterization (92% independent under supervision), the present study demonstrates a high level of proficiency. These findings resonate with the ACGME Assessment Guidebook (2020), which emphasizes that direct observation and competency-based assessments are effective in ensuring mastery of foundational skills. The high independence rates also align with the self-assessment study by Kuppli et al. (2022)⁴, where interns reported strong confidence in routine procedures after structured training. However, the slightly lower independence in nasogastric tube insertion (87%) and CPR (89%) suggests that even basic procedures may benefit from additional practice, a notion supported by Singh and Nagmoti (2021)⁵, who found variability in skill acquisition based on teaching frequency and assessment rigor.

The association between internship posting attendance and diagnostic confidence (Table 4) revealed that 79% of interns felt confident, with a significant chi-square value (17.760, $p=0.038$). This correlation is consistent with Acosta et al. (2018), who linked structured training attendance with increased confidence in clinical decision-making. The highest confidence (44%) was observed among those attending 80-90% of postings, suggesting a threshold effect of exposure, a finding supported by Krajewski et al. (2013)³, who noted improved competencies with consistent internship participation. However, the 6% reporting "not confident" and 13% "neutral" indicate persistent gaps, potentially related to mental health or evaluation biases, as explored in the studies on medical student mental health (2020) and gender disparity in evaluations (2021)⁷. These references highlight external factors that may influence confidence beyond mere attendance.

Comparatively, the present study's emphasis on supervised independence aligns with the Entrustable Professional Activities (EPAs) framework discussed in the 2021 PMC article, which advocates for progressive autonomy in medical training. However, unlike Herren et al. (2023), who focused on specialized resuscitation courses, this study covers a broader range of skills, suggesting a more generalized competency profile among students. The lower independence in complex procedures (e.g., episiotomy suturing, intubation) compared to simpler tasks (e.g., injections) also underscores the need for tailored training adjustments, as proposed by Kuppli et al. (2022)⁵ in their concept for nationalized assessments.

CONCLUSION

The study highlights variability in the clinical competencies of medical interns, with a higher level of independent performance observed in basic procedures such as venous blood withdrawal, intramuscular injections, and bladder catheterization, while more complex procedures like episiotomy suturing and endotracheal intubation showed lower proficiency. A significant association was found between internship posting attendance and confidence in diagnosing common diseases, emphasizing the importance of hands-on clinical exposure. These findings underscore the need for structured supervision, targeted training, and

continuous competency assessments within Competency-Based Medical Education (CBME) programs to enhance skill acquisition. Strengthening clinical training with increased exposure to advanced procedures and systematic assessments will help bridge existing competency gaps and better prepare interns for independent medical practice.

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