

Perceptions and Self-Reported Confidence in Paediatric Clinical Skills Among Medical Trainees: A Cross-Sectional Survey at a Tertiary Care Teaching Hospital

Akshay Kalidindi¹, Rajkumar Gajendran²

¹Post Graduate, ²Professor Department of Paediatrics, Chettinad Hospital and Research Institute, Chettinad Academy of Research and Education (CARE), Kelambakkam, Tamil Nadu, India

Correspondence: Dr. Rajkumar Gajendran | rajthekok@gmail.com

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ABSTRACT:

Introduction: Paediatric clinical skill training is a cornerstone of medical education, yet how self-reported confidence evolves across the training continuum from undergraduate study through early and senior residency remains poorly characterised in the Indian context.

Objectives: To assess and compare self-reported confidence in core paediatric clinical skills among final-year MBBS students, first-year postgraduate (JR-1) residents and second/third-year postgraduate (JR) residents; to identify perceived barriers; to explore preferred teaching modalities; and to examine the correlation between self-reported confidence and objective OSCE performance in the postgraduate subgroup.

Methods: A cross-sectional, questionnaire-based survey was conducted among 113 medical trainees at CHRI: 60 final-year MBBS students, 20 JR-1 residents, and 33 JR residents (Batches 2023 and 2024). Confidence was assessed across six clinically-oriented domains on a 5-point Likert scale using group-appropriate versions of a structured tool. OSCE (OSCR) marks, available only for the JR subgroup, were correlated with self-reported scores. Kruskal-Wallis tests with Bonferroni-corrected post-hoc comparisons examined differences across the three trainee levels.

Results: The overall composite confidence score (N=113) was 3.80 ± 0.44 . Growth and Developmental Assessment was consistently the highest-scoring domain across all three levels (4.07–4.11). While overall composite confidence did not differ significantly across levels ($p=0.256$), four of six domains varied significantly: Clinical Examination ($p=0.007$), Neonatal Assessment ($p=0.002$), Procedures and Resuscitation ($p=0.004$), and Caregiver Communication ($p=0.001$). JR-1 residents reported the lowest confidence of the three groups in five of six domains, most markedly in Procedures & Resuscitation (3.18 ± 0.85) and Neonatal Assessment (3.20 ± 0.83), with recovery evident by JR. Caregiver Communication showed the opposite

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pattern, declining from 3.76 in MBBS students to 3.03 in JR residents ($p=0.001$). Batch 2023 achieved significantly higher OSCR scores than Batch 2024 (29.5 vs 25.2; $p=0.024$), while composite confidence did not correlate with OSCR performance ($r=0.332$, $p=0.063$). Bedside teaching was the most preferred learning modality across all levels (87.6% overall).

Conclusion: Confidence trajectories across the paediatric training continuum are non-linear and domain-specific. A transient dip in procedural and neonatal confidence at the MBBS-to-residency transition (JR-1) recovers with experience, consistent with the internationally described "transition shock" phenomenon, whereas caregiver communication confidence paradoxically declines with seniority. Structured procedural simulation targeted at the transition to residency, alongside a dedicated communication-skills curriculum for senior residents, are recommended.

Keywords: Paediatric clinical skills; self-reported confidence; medical education continuum; transition to residency; OSCE

INTRODUCTION

Paediatric history taking and clinical examination represent foundational competencies in medical training. Unlike adult clinical encounters, paediatric assessment is complicated by communication barriers inherent to different developmental stages, heavy reliance on caregiver histories, and the challenge of examining uncooperative or anxious children.[1] These unique demands render paediatric skill acquisition a distinct educational challenge that cannot be extrapolated from adult medicine training alone.

In the Indian context, formal exposure to paediatric clinical skills spans the undergraduate (MBBS), internship and postgraduate residency periods, with structured but variable curricular emphasis at each stage. While standardised OSCE-based assessments (OSCR) have improved objective measurement of clinical competence,[2] the subjective dimension of self-reported confidence which independently predicts clinical behaviour, help-seeking, and patient safety outcomes remains inadequately studied across this continuum.[3] Competency-based medical education (CBME) frameworks now mandate that training programs address both objective skill attainment and trainee self-efficacy.[4]

Self-efficacy theory, as formulated by Bandura, posits that an individual's belief in their own capabilities significantly governs performance, persistence and clinical decision-making.[3] Prior surveys from Western and South-East Asian settings have demonstrated that trainee confidence is domain-specific, with procedural and communication competencies consistently identified as areas of relative deficit.[6,7] Separately, the international literature on the transition from medical student to junior doctor describes a well-recognised "transition shock", in which self-confidence often dips sharply at the point of assuming clinical responsibility before recovering with accumulated experience.[9] Whether an analogous dip occurs at the transition from undergraduate paediatric postings to first-year postgraduate residency has not, to our knowledge, been examined in a South Indian tertiary care setting.

This study was therefore extended beyond its original postgraduate-only scope to systematically assess self-reported confidence across six clinically validated paediatric skill domains in final-year MBBS students, first-year (JR-1) and senior (JR) postgraduate residents; identify perceived barriers to skill acquisition; characterise preferred learning modalities; and examine both the relationship between self-reported confidence and objective OSCE performance,

and the trajectory of confidence across the training continuum.[8]

OBJECTIVES

1. To assess self-reported confidence of final-year MBBS students, first-year (JR-1) and senior (JR) postgraduate paediatric residents in core paediatric clinical skills across six domains (history taking, clinical examination, growth and developmental assessment, neonatal assessment, procedures and resuscitation and caregiver communication).
2. To identify perceived challenges and barriers to paediatric skill acquisition at each stage of training.
3. To explore preferred learning and teaching modalities for paediatric clinical training.
4. To examine the correlation between self-reported confidence scores and objective OSCE performance in the postgraduate (JR) subgroup.
5. To compare confidence trajectories across the training continuum from undergraduate study through senior residency.

MATERIAL AND METHODS

Study Setting and Design

A cross-sectional, questionnaire-based survey was conducted at Chettinad Hospital and Research Institute (CHRI), a 1,500-bed tertiary care teaching hospital in Kelambakkam, Tamil Nadu, affiliated to Chettinad Academy of Research and Education (CARE Deemed University), following approval from the Institutional Human Ethics Committee for Student Research (IHEC-I/4213/25). Data collection comprised the JR postgraduate cohort (Batches 2023 and 2024) surveyed initially, followed by an expanded second phase surveying final-year MBBS students and JR-1 residents to characterise confidence across the full undergraduate-to-residency continuum, as originally proposed.

Study Population and Sampling

The study population comprised three trainee groups in the Department of Paediatrics and Neonatology at CHRI: (i) final-year MBBS

students (n=60) who had completed at least one paediatric posting; (ii) first-year postgraduate residents, JR-1 (n=20, Batch 2025); and (iii) second- and third-year postgraduate residents, JR (n=33; 16 from Batch 2023, 17 from Batch 2024). Inclusion criteria were: completion of at least one structured paediatric posting and provision of informed consent. Students or residents without any paediatric exposure, or unwilling to participate, were excluded. Convenience sampling was employed for all three groups given the enumerable population at a single institution. Of 37 eligible JR residents, 33 (89.2%) completed the survey; corresponding eligible-pool figures were not separately recorded for the MBBS and JR-1 cohorts. The JR group spans second- and third-year postgraduate residents and is analysed as a single pooled subgroup throughout; it is differentiated internally only by academic batch (2023 vs 2024) for the OSCE comparison, as individual second- versus third-year status at the time of survey completion was not separately recorded.

Study Tool

A structured, self-administered questionnaire was used across all three groups. The JR cohort completed the original 24-item tool assessing six confidence domains on a 5-point Likert scale (1=Not confident, 5=Very confident): History Taking (5 items), Clinical Examination (7 items), Growth and Developmental Assessment (5 items), Neonatal Assessment (2 items), Procedures and Resuscitation (3 items), and Caregiver Communication (2 items). The MBBS and JR-1 cohorts completed an expanded version of the same instrument (30 and 31 Likert items respectively) that additionally incorporated seven attitudinal/barrier statements (e.g., perceived impact of bedside teaching, hands-on opportunities, simulation availability, faculty time, and anxiety while examining sick children). To permit cross-group comparison, domain scores for the MBBS and JR-1 cohorts were computed from the 23 skill items that content-matched the six PG domains (History 5, Clinical Examination 7, Growth & Development 5, Neonatal 2, Procedures 2, Caregiver Communication 2); the seven attitudinal items

were considered supplementary and are not included in the domain composite. All groups additionally completed open-ended items on perceived barriers and preferred learning modalities. Questionnaire completion required approximately 8–10 minutes.

OSCE Performance

Objective Structured Clinical Examination (OSCE) marks (termed OSCR in this institution, range 0–40) were available from departmental records only for the JR cohort (32 of 33 participants); OSCR data were not available for the MBBS or JR-1 cohorts and OSCE-confidence correlation analysis is therefore restricted to the JR subgroup, as in the original study design.

Statistical Methods

Data were entered and analysed using Python 3.12 with pandas, scipy, and matplotlib. Categorical data are presented as frequency and percentage; continuous data as mean $\pm$ standard deviation (SD). Domain confidence scores were computed as the arithmetic mean of constituent item scores. Differences in domain and composite confidence scores across the three

trainee levels were assessed using the Kruskal-Wallis test, with Bonferroni-corrected pairwise Mann-Whitney U tests performed post-hoc where the omnibus test was significant. Within the JR subgroup, OSCR scores between batches were compared using the independent samples t-test after confirming normality by Shapiro-Wilk test, and Pearson's correlation coefficient (r) examined the relationship between composite confidence and OSCR scores, as in the original analysis. Statistical significance was set at $p < 0.05$.

RESULTS

Participant Demographics

A total of 113 medical trainees participated: 60 final-year MBBS students (53.1%), 20 JR-1 residents (17.7%), and 33 JR residents (29.2%; 16 Batch 2023, 17 Batch 2024). Sex distribution and OSCR performance were recorded only for the JR subgroup, where the overall distribution was near-equal (51.5% female) and mean OSCR scores were significantly higher in Batch 2023 (29.5 ± 5.9) than Batch 2024 (25.2 ± 4.1 ; $t=2.378$, $p=0.024$). Participant demographics are summarised in Table 1.

Table 1: Demographic and OSCE Characteristics of Participants (N=113)

Trainee Level	N	% of Sample	OSCR Mean (SD)	OSCR Range
MBBS (Final Year)	60	53.1%	N/A	N/A
JR-1 (First-Year PG)	20	17.7%	N/A	N/A
PG Batch 2023 (JR)	16	14.2%	29.5 (5.9)	16.5 - 40.0
PG Batch 2024 (JR)	17	15.0%	25.2 (4.1)	18.5 - 32.0
Total	113	100%	27.3 (5.5)[†]	16.5 - 40.0

[†]OSCR data available for 32 of 33 JR participants; one Batch-2024 participant had missing OSCR data. Batch labels (2023/2024) reflect academic intake year, not confirmed second- versus third-year PG status; the two batch rows are shown separately here only to support the

OSCR comparison and are pooled as a single JR group elsewhere in this paper.

Self-Reported Confidence by Domain and Trainee Level

The overall composite confidence score across all 113 trainees was 3.80 ± 0.44 (out of 5). Growth

and Developmental Assessment was the highest-scoring domain in every group (4.07–4.11), suggesting a consistently strong curricular emphasis on this domain across the continuum. Overall composite confidence did not differ significantly across the three levels (Kruskal-Wallis, $H=2.73$, $p=0.256$), remaining virtually identical between MBBS students and JR residents (3.85 ± 0.41 for both) and lowest among JR-1 residents (3.60 ± 0.54). However, domain-level analysis revealed significant differences by trainee level in four of six domains: Clinical Examination ($p=0.007$), Neonatal Assessment ($p=0.002$), Procedures and

Resuscitation ($p=0.004$), and Caregiver Communication ($p=0.001$). JR-1 residents recorded the lowest confidence of the three groups in five of six domains — most strikingly in Procedures & Resuscitation (3.18 ± 0.85) and Neonatal Assessment (3.20 ± 0.83) — with confidence recovering by JR in Clinical Examination and Neonatal Assessment. Caregiver Communication showed the reverse pattern, declining progressively from MBBS (3.76 ± 0.60) through JR-1 (3.55 ± 0.69) to its lowest point in JR (3.03 ± 1.03). Domain scores are detailed in Table 2, statistical comparisons in Table 2b, and illustrated in Figure 1.

Table 2: Self-Reported Confidence Scores by Domain and Trainee Level (Mean $\pm$ SD)

Domain	MBBS Final Year (n=60)	JR-1 (n=20)	JR (n=33)
History Taking	4.08 ± 0.51	3.84 ± 0.51	3.94 ± 0.51
Clinical Examination	3.57 ± 0.51	3.34 ± 0.64	3.90 ± 0.63
Growth & Development	4.11 ± 0.49	4.07 ± 0.64	4.09 ± 0.64
Neonatal Assessment	3.69 ± 0.68	3.20 ± 0.83	4.08 ± 0.86
Procedures & Resuscitation	3.83 ± 0.64	3.18 ± 0.85	3.59 ± 0.85
Caregiver Communication	3.76 ± 0.60	3.55 ± 0.69	3.03 ± 1.03
Overall Composite	3.85 ± 0.41	3.60 ± 0.54	3.85 ± 0.41

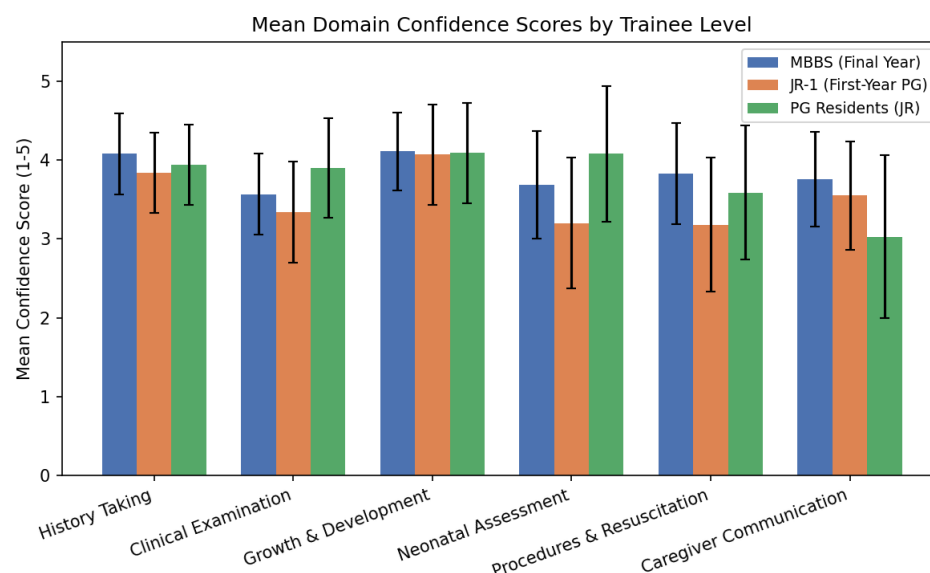
Table 2b: Kruskal-Wallis Comparison Across Trainee Levels

Domain	H (KW)	p-value	Significant Post-hoc Pairs (Bonferroni)
History Taking	3.37	0.185	None
Clinical Examination	10.03	0.007*	MBBS vs JR ($p=0.014$); JR-1 vs JR ($p=0.034$)
Growth & Development	0.09	0.955	None
Neonatal Assessment	12.88	0.002*	JR-1 vs JR ($p=0.004$)
Procedures & Resuscitation	10.99	0.004*	MBBS vs JR-1 ($p=0.003$)

Caregiver Communication	13.43	0.001*	MBBS vs JR ($p=0.001$)
Overall Composite	2.73	0.256	None

* $p<0.05$. Post-hoc pairwise comparisons used Mann-Whitney U tests with Bonferroni correction ($\times 3$).

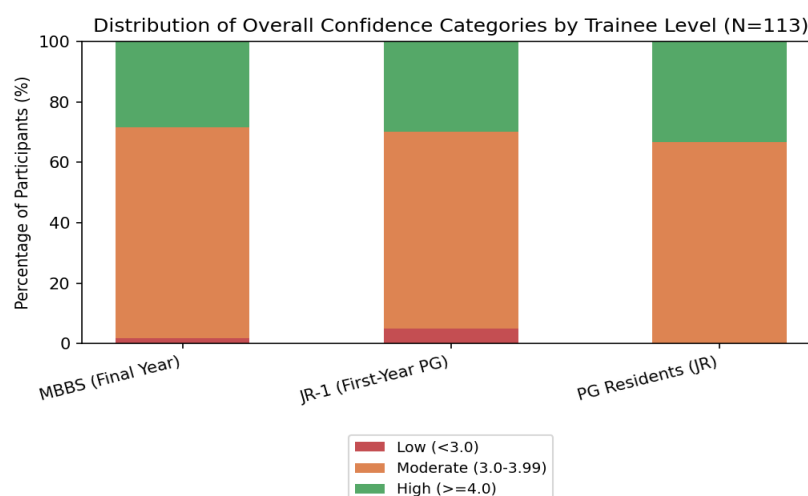
Figure 1: Mean Domain Confidence Scores by Trainee Level



Confidence Level Distribution

When categorised by overall composite score, 2 participants (1.8%) fell in the low confidence range (<3.0), 77 (68.1%) demonstrated moderate confidence (3.00–3.99), and 34 (30.1%) demonstrated high confidence (≥ 4.0). This distribution was broadly similar across the three trainee levels (MBBS: 1.7%/70.0%/28.3%; JR-1: 5.0%/65.0%/30.0%; JR: 0%/66.7%/33.3% for low/moderate/high respectively), indicating that while composite confidence categories were stable, the domain-level shifts described above were masked at the aggregate level. This distribution is depicted in Figure 2.

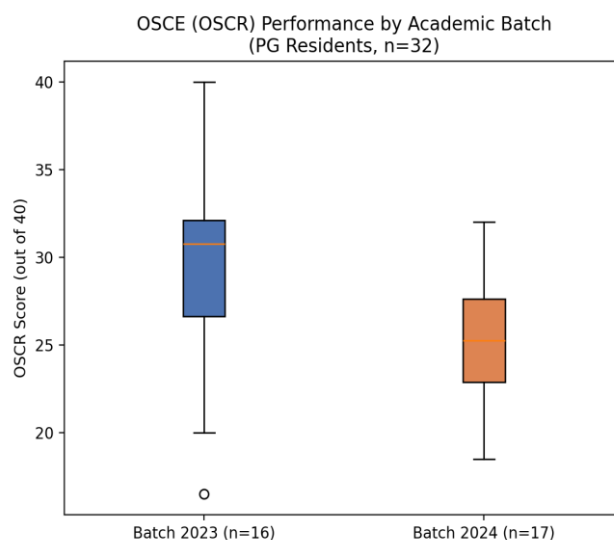
Figure 2: Distribution of Overall Confidence Categories by Trainee Level (N=113)



OSCE Performance (JR Subgroup)

Batch 2023 achieved a significantly higher mean OSCR score (29.5 ± 5.9) compared to Batch 2024 (25.2 ± 4.1 ; independent t-test: $t=2.378$, $df=30$, $p=0.024$). OSCR scores ranged from 16.5 to 40.0 overall, with box plot distributions depicted in Figure 3. Pearson's correlation between composite confidence and OSCR scores was positive but did not reach statistical significance ($r = 0.332$, $p = 0.063$).

Figure 3: OSCE (OSCR) Performance by Academic Batch (JR, n=32)



Perceived Barriers

Across all 113 participants, systemic and general clinical examination was the most frequently cited area of lowest confidence overall (56.6%), driven predominantly by MBBS students (71.7%). Procedural skills — particularly intubation, airway management, and IV/intraosseous access — were the second most common concern overall (20.4%) and were

disproportionately reported by JR-1 residents (35.0%), who also cited neonatal examination and assessment far more frequently (25.0%) than MBBS students (1.7%) or JR residents (0%). This pattern is consistent with JR-1 residents newly assuming direct responsibility for neonatal and emergency procedural care without the accumulated repetition available to senior residents. Barriers are summarised in Table 3.

Table 3: Least-Confident Skill Domains by Trainee Level (Free-Text, Categorical)

Least-Confident Skill Domain	MBBS (n=60)	JR-1 (n=20)	JR (n=33)	Combined (N=113)
Systemic / general clinical examination	43 (71.7%)	3 (15.0%)	18 (54.5%)	64 (56.6%)
Procedures / resuscitation / IV access	5 (8.3%)	7 (35.0%)	11 (33.3%)	23 (20.4%)
Neonatal examination/assessment	1 (1.7%)	5 (25.0%)	0 (0%)	6 (5.3%)
History taking	4 (6.7%)	1 (5.0%)	0 (0%)	5 (4.4%)
Examining uncooperative/anxious child	2 (3.3%)	1 (5.0%)	1 (3.0%)	4 (3.5%)

Clinical reasoning / diagnosis	0 (0%)	1 (5.0%)	1 (3.0%)	2 (1.8%)
Growth / nutrition / development	1 (1.7%)	0 (0%)	0 (0%)	1 (0.9%)
Other / non-specific	2 (3.3%)	2 (10.0%)	2 (6.1%)	4 (3.5%)

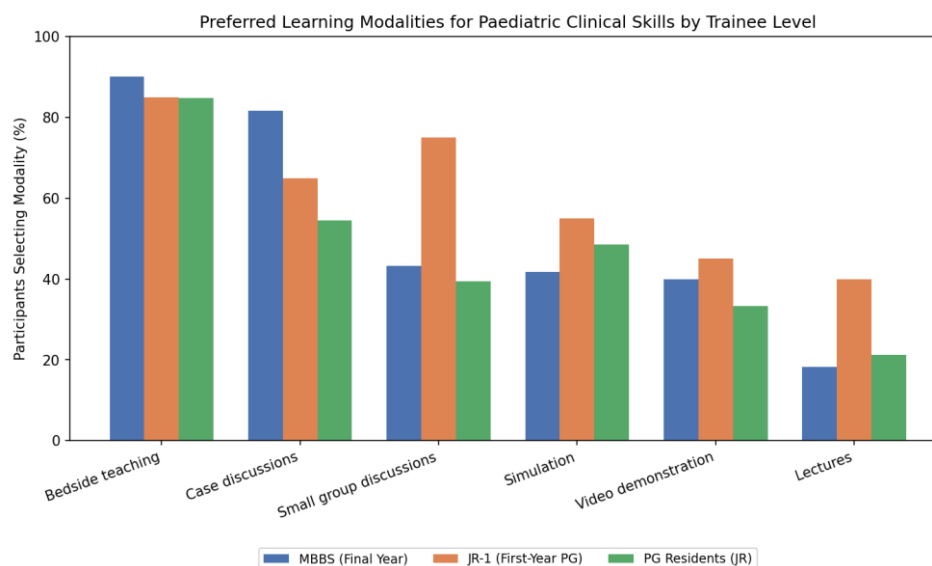
Percentages calculated against each group's total N; two MBBS and two JR responses were non-specific (e.g., "nil", "all") and excluded from categorisation.

Preferred Learning Modalities

Bedside teaching was the overwhelmingly preferred modality across all three trainee levels (MBBS 90.0%, JR-1 85.0%, JR 84.8%; combined 87.6%). Beyond this, preferences diverged by

level: MBBS students strongly favoured case discussions (81.7%) over small group discussions (43.3%), whereas JR-1 residents showed a markedly higher preference for small group discussions (75.0%) and simulation (55.0%) than either MBBS students or JR residents, plausibly reflecting a desire for more structured, lower-stakes learning during the early residency transition. Preferences are illustrated in Figure 4.

Figure 4: Preferred Learning Modalities for Paediatric Clinical Skills by Trainee Level



DISCUSSION

This expanded cross-sectional survey of 113 medical trainees at CHRI demonstrates that self-reported confidence in paediatric clinical skills follows a non-linear, domain-specific trajectory across the training continuum rather than a simple linear increase with seniority. While overall composite confidence remained statistically similar across MBBS, JR-1, and JR levels ($p=0.256$), this aggregate stability concealed a significant transient dip in procedural, neonatal, and general clinical examination confidence at the JR-1 stage — the point at which trainees first assume direct clinical

responsibility as postgraduate residents. This pattern mirrors the internationally described "transition shock" seen at the student-to-junior-doctor interface, in which confidence characteristically declines before recovering with accumulated hands-on experience.[9] A similar gap between undergraduate preparation and the clinical responsibilities expected of newly qualified postgraduate trainees has been documented elsewhere in paediatrics, reinforcing that this transition is a recognised vulnerability point rather than an artefact specific to this cohort.[11]

Growth and Developmental Assessment remained the domain of highest confidence at every level, likely reflecting consistent curricular emphasis throughout training. In contrast, Caregiver Communication showed a distinctive and counter-intuitive decline with seniority, from 3.76/5 among MBBS students to 3.03/5 among JR residents ($p=0.001$) — the lowest domain score recorded in the entire cohort. This may reflect senior residents' greater awareness of the complexity of caregiver counselling in emotionally charged clinical situations, a form of calibrated self-assessment rather than a true decline in ability, though this cannot be confirmed without an objective communication-skills assessment.

The significantly superior OSCE performance of Batch 2023 over Batch 2024 ($p=0.024$) within the JR subgroup, together with the positive but non-significant correlation between composite confidence and OSCE scores ($r=0.332$, $p=0.063$), corroborates the previously noted dissociation between self-reported confidence and objectively assessed competence in this cohort.[5] This mirrors an undergraduate paediatric OSCE study in which pre-test confidence agreed poorly with subsequently assessed skill performance, supporting the view that confidence and competence should be measured independently rather than assumed to track one another.[10] The near-universal preference for bedside teaching (87.6% overall) and the JR-1 cohort's particular preference for small-group discussions and simulation (75.0% and 55.0% respectively) together indicate that residency-transition-specific educational interventions rather than a uniform curriculum applied equally across all levels are likely to be most effective.

These findings have direct curricular implications. Structured procedural and neonatal resuscitation simulation should be concentrated around the MBBS-to-JR-1 transition, when the confidence dip is most pronounced, rather than distributed evenly across residency; simulation-based resuscitation training in other paediatric residency cohorts has produced measurable gains in self-confidence alongside observed

performance, supporting this approach.[14] Communication skills training specifically, caregiver counselling in emotionally charged situations — warrants explicit curriculum space for senior residents, potentially modelled on validated frameworks such as SPIKES[12] and NURSE[13], rather than being assumed to develop passively with clinical experience.

This study has several limitations. Its cross-sectional design and restriction to a single institution limit generalisability and preclude true longitudinal inference about individual trainees' trajectories. Sample sizes for the JR-1 ($n=20$) and JR ($n=33$) subgroups were modest. Most importantly, the MBBS and JR-1 cohorts completed an expanded version of the questionnaire (30–31 items) rather than the identical 24-item instrument used for JR residents; although the 23 core skill items were content-matched to the same six domains, minor wording differences could not be independently verified, and one item unique to the JR-1 instrument could not be confidently mapped to a domain and was excluded. Sex distribution and OSCE performance data were not captured for the MBBS and JR-1 cohorts, precluding OSCE-confidence correlation analysis beyond the JR subgroup. Free-text barrier responses were categorised post-hoc by the study team, introducing potential classification subjectivity. Future multi-institutional, longitudinal studies using a single harmonised instrument across all trainee levels — ideally following the same individuals from MBBS through senior residency — should confirm whether the confidence dip observed at JR-1 and the paradoxical decline in caregiver communication confidence with seniority are reproducible, and should test targeted educational interventions timed to the residency transition against both self-reported and objective outcome measures.

CONCLUSION

Confidence in paediatric clinical skills follows a non-linear, domain-specific trajectory across the training continuum, with a transient dip in procedural and neonatal confidence at the JR-1 transition and a paradoxical decline in caregiver

communication confidence with seniority, neither of which was reflected in the stable overall composite score. Because self-reported confidence did not correlate with objective OSCE performance, confidence alone is an unreliable proxy for competence and should not substitute for direct assessment. Structured

procedural simulation timed to the residency transition, together with a dedicated communication-skills curriculum for senior residents, is recommended, with confirmation needed from future longitudinal, multi-institutional studies.

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