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# Career clarity and demand for structured career counselling among medical students: a multicentre cross-sectional study and implementation framework

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**Research Article**

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## Abstract

# Background

Structured institutional career counselling is not routinely integrated into undergraduate medical education in India, despite increasing complexity in postgraduate specialty pathways. Social Cognitive Career Theory (SCCT) emphasises contextual supports in translating self-efficacy and outcome expectations into stable career goals. We examined career clarity and perceived need for structured institutional career counselling among undergraduate medical students and developed a theory-grounded implementation framework and developed a staged implementation framework (India–Seed–Sprout–Sapling; I3S).

# Methods

A multicentre cross-sectional survey was conducted between January and April 2024 among 295 MBBS students from four urban medical colleges (two government and two private). The primary outcome was perceived need for structured institutional career counselling (Yes vs No/Not sure). Predictor variables included gender, academic year, doctor in family, independent MBBS choice, awareness of aptitude assessment tools, and high career clarity. Associations were analysed using chi-square tests and multivariable logistic regression. Career clarity (four-level ordinal variable) was examined using ordinal logistic regression adjusting for gender and doctor in family. The I3S framework underwent expert content validation using item- and scale-level Content Validity Indices (CVI), Wilson 95% confidence intervals, and modified kappa statistics.

# Results

Of 295 participants, 223 (75.6%) perceived a need for structured institutional counselling. Only 53 students (18.0%) reported high career clarity, indicating limited decisional confidence during undergraduate training and 67 (22.7%) were aware of aptitude assessment tools. Career clarity demonstrated a positive trend across advancing academic years (adjusted OR 1.16, 95% CI 1.05–1.28; $p < 0.01$). No variable was significantly associated with perceived counselling need. The regression model explained minimal variance (Nagelkerke $R^2=0.03$). I-CVI ranged from 0.889 to 1.00, with S-CVI/Ave 0.975 and modified kappa ≥ 0.887, indicating excellent agreement.

# Conclusion

Three-fourths of undergraduate medical students perceived a need for structured institutional career counselling irrespective of background. Although career clarity improved with progression, demand for

institutional guidance remained high across institutions. The I3S framework offers a theory-grounded, curriculum-integrated model to support implementation within existing mentorship structures.

# BACKGROUND

Career development in professional education in India has increasingly shifted toward institutionalised support systems. Engineering and technical institutions are required by regulatory bodies such as the All India Council for Technical Education to establish structured training, placement and career guidance cells.[1] In contrast, undergraduate medical education in India does not typically operate dedicated institutional career counselling units and has largely relied on informal mentorship and examination performance as proxies for career decision-making.

Social Cognitive Career Theory (SCCT) conceptualises career formation as the interaction of self-efficacy, outcome expectations and contextual supports.[2–4] In the absence of structured supports, interests may not translate into stable goals.[4,5]

International evidence demonstrates that specialty preferences evolve during training and are influenced by exposure patterns, lifestyle perceptions and professional identity formation.[6–9] Psychological distress and career indecision among medical students are widely reported and associated with decisional strain.[10–12] Structural prestige hierarchies and hidden curriculum dynamics further influence specialty trajectories.[13,14]

In India, postgraduate specialty allocation is largely rank-based through competitive examination performance. While transparent, this mechanism may compress reflective alignment into examination metrics. Specialty preference patterns have demonstrated temporal clustering, with certain branches experiencing periods of heightened popularity followed by decline. In the absence of structured counselling, students may default to prevailing trends rather than undertake systematic reflective self-assessment. Whether clarity improves organically with academic progression in the absence of structured guidance remains unclear.

Although the National Medical Commission's Competency-Based Medical Education (CBME) and AETCOM frameworks incorporate mentorship components, structured longitudinal career counselling comparable to other professional domains remains uncommon.[16,17] Despite increasing recognition of career decision-making as a developmental process during medical training, empirical evidence examining career clarity progression and institutional support needs among medical students remains limited.

This study represents a structured needs assessment intended to inform institutional implementation rather than evaluate intervention effectiveness. We aimed to determine whether undergraduate medical students perceive a need for structured institutional career counselling and whether such demand varies across demographic categories. Based on the findings, we developed and content-validated the India–Seed–Sprout–Sapling (I3S) framework.

# METHODS

### Study design and participants

A cross-sectional survey was conducted between January and April 2024 among 295 MBBS students from four urban medical colleges (two government and two private). Stratified sampling by academic year was used to ensure proportional representation. Participation was voluntary and responses were collected anonymously through an online questionnaire.

### Variables

Primary outcome: Perceived need for structured institutional career counselling (Yes vs No/Not sure).

Predictor variables: Gender; academic year; doctor in family; independent MBBS choice; awareness of aptitude assessment tools; and high career clarity ("Very clear" vs others).

The full survey instrument is provided in Supplementary Appendix (Part A).

### Statistical analysis

Chi-square tests assessed univariate associations between predictor variables and perceived counselling need. Multivariable logistic regression was performed with perceived need for structured counselling as the dependent variable. Statistical significance was set at $p < 0.05$. Model fit was assessed using Nagelkerke $R^2$.

Career clarity was additionally analysed as a four-level ordinal outcome (not clear, somewhat clear, clear, very clear). Ordinal logistic regression using the proportional odds model was employed to examine the association between academic year and career clarity. The model was adjusted for gender and presence of a doctor in the family. The proportional odds assumption was tested and satisfied. A sensitivity analysis excluding fourth-year students assessed robustness of the observed trend. Statistical analysis was performed using IBM SPSS Statistics for Windows, Version 26.0 (IBM Corp., Armonk, NY, USA).

### Content validation of the I3S framework

The proposed I3S framework underwent structured expert content validation. The expert panel comprised nine senior academic leaders representing diverse clinical and administrative backgrounds.

Experts rated 18 framework components across Seed, Sprout and Sapling stages using a 4-point relevance scale (1 = not relevant; 4 = highly relevant). Ratings of 3 or 4 were considered agreement.

Item-level Content Validity Index (I-CVI) was calculated as the proportion of experts rating an item as relevant. Scale-level Content Validity Index (S-CVI/Ave) was computed as the mean of I-CVI values. Wilson score 95% confidence intervals and modified kappa (K*) statistics were calculated to assess agreement beyond chance.

### Ethics approval and consent to participate

The study involved a voluntary, anonymous questionnaire-based survey with no collection of identifiable personal data and minimal risk to participants. Electronic informed consent was obtained from all participants prior to completion of the survey. The Institutional Ethics Committee of Care Hospitals, Visakhapatnam reviewed the study and granted a waiver of formal ethical approval (IEC Ref No: 05/IECC/2026).

## RESULTS

### Participant characteristics

Demographic characteristics are shown in Table 1. Forty percent reported having a doctor in the immediate family, and 68.8% independently chose MBBS.

**Table 1. Demographic characteristics of participants (n=295)**

| Variable | n (%) |
|---|---|
| **Sex** | |
| Male | 185 (62.7) |
| Female | 110 (37.3) |
| **Doctor in family** | |
| Yes | 118 (40.0) |
| No | 177 (60.0) |
| **MBBS choice** | |
| Independent | 203 (68.8) |
| Influenced | 92 (31.2) |

Values are presented as number (percentage). Percentages were calculated using the total sample size (n=295) as denominator. “Independent” includes students reporting complete self-decision; “Influenced” includes students reporting family or external influence.

### Career indicators

Career clarity and counselling indicators are shown in Table 2. Only 18.0% reported high career clarity. Awareness of aptitude assessment tools was 22.7%. However, 75.6% perceived a need for structured institutional counselling.

**Table 2. Career indicators among undergraduate medical students (n=295)**

| Indicator | n (%) |
|---|---|
| **Career clarity** | |
| High clarity (“Very clear”) | 53 (18.0) |
| Other responses* | 242 (82.0) |
| **Awareness of aptitude assessment tools** | |
| Yes | 67 (22.7) |
| No | 228 (77.3) |
| **Perceived need for institutional career counselling** | |
| Yes | 223 (75.6) |
| No/Not sure | 72 (24.4) |

*Includes responses “Somewhat clear,” “Unsure,” and “Not clear.”

Values are presented as number (percentage). Percentages were calculated using the total sample size (n=295) as denominator. High career clarity was defined as response “Very clear.”

**Logistic regression analysis**

Multivariable logistic regression results are presented in Table 3. No predictor variable was significantly associated with perceived counselling need. The model explained minimal variance (Nagelkerke $R^2$ = 0.03), indicating that counselling demand was broadly distributed across demographic groups.

**Table 3. Multivariable logistic regression analysis predicting perceived need for structured institutional career counselling (n=295)**

| Variable | Adjusted OR | 95% CI | p value |
|---|---|---|---|
| Female (vs male) | 1.21 | 0.62–2.36 | 0.57 |
| Doctor in family (yes vs no) | 0.93 | 0.49–1.76 | 0.82 |
| Independent MBBS choice (yes vs no/partial) | 1.18 | 0.59–2.37 | 0.64 |
| Senior academic year* | 1.07 | 0.83–1.39 | 0.59 |
| Awareness of aptitude tools (yes vs no) | 0.88 | 0.44–1.75 | 0.71 |
| High career clarity (yes vs no) | 0.91 | 0.42–1.97 | 0.81 |

Nagelkerke $R^2$ = 0.03

OR: odds ratio; CI: confidence interval.
Primary outcome variable: perceived need for structured institutional career counselling (Yes vs No/Not sure).
High career clarity defined as response “Very clear.”
*Senior academic year analysed as an ordinal variable representing progression across MBBS training years.
Statistical significance set at $p < 0.05$.

**Determinants of career clarity**

Career clarity demonstrated a progressive increase across advancing academic years. In ordinal logistic regression analysis as in Table 4, each progression in academic year was associated with higher odds of reporting greater career clarity (adjusted OR 1.16, 95% CI 1.05–1.28; $p<0.01$). This association remained significant after adjusting for gender and presence of a doctor in the family. Gender was not independently associated with clarity, while having a doctor in the family showed a non-significant trend toward higher clarity. The proportional odds assumption was satisfied. Sensitivity analysis excluding fourth-year students did not materially alter the findings.

**Table 4. Ordinal logistic regression analysis of factors associated with career clarity (n=295)**

| Variable | Adjusted OR | 95% CI | p value |
|---|---|---|---|
| Academic year (per progression) | 1.16 | 1.05–1.28 | <0.01 |
| Female (vs male) | 0.95 | 0.72–1.26 | 0.73 |
| Doctor in family (yes vs no) | 1.22 | 0.98–1.51 | 0.07 |

Outcome variable: career clarity (four-level ordinal variable). Model adjusted for gender and doctor in family. Proportional odds assumption satisfied.

**Content validity**

I-CVI values ranged from 0.889 to 1.00. The scale-level CVI (S-CVI/Ave) was 0.975. Wilson 95% confidence intervals reflected acceptable precision, and modified kappa (K*) values ranged from 0.887 to 1.00, indicating excellent agreement beyond chance.

# DISCUSSION

Structured career guidance during undergraduate medical training remains an underdeveloped component of medical education in many settings worldwide. In our study, three-quarters of undergraduate medical students perceived a need for structured institutional career counselling, indicating a substantial unmet demand for formalised career support. In contrast to professional courses where career guidance units are formally mandated, undergraduate medical education often

relies on informal mentorship and examination performance as proxies for career decision-making.[1] Our findings further demonstrate that career clarity develops progressively during undergraduate training, yet the perceived need for structured institutional counselling remains consistently high across student groups. In India, dedicated institutional career counselling structures within undergraduate medical education remain uncommon, and the absence of formalised career scaffolding may therefore represent a systemic contextual gap.[1]

The low explanatory power of the regression model (Nagelkerke $R^2$=0.03) suggests that demographic characteristics explain only a small proportion of variation in perceived counselling need, indicating that demand for structured career guidance may reflect broader institutional expectations rather than individual background factors. Although our sample included urban institutions, specialty aspirations are often shaped by future practice goals rather than the geographic location of undergraduate training; this inference warrants empirical confirmation in rural contexts. Within the Social Cognitive Career Theory framework, contextual supports are central to translating self-efficacy beliefs and outcome expectations into stable career goals.[2–4,15] The broadly distributed demand observed in our study is therefore consistent with the proposition that institutional scaffolding functions as an important contextual support across learner profiles.

Career clarity demonstrated a significant positive association with advancing academic year independent of gender and family medical background, suggesting that experiential exposure during training contributes to incremental decisional confidence. However, despite this progressive increase in clarity, the high and demographically uniform demand for structured counselling persisted. This pattern suggests that career clarity may currently develop largely through passive exposure rather than through systematic institutional guidance.

International literature indicates that specialty preferences are influenced by lifestyle considerations, evolving professional expectations and exposure patterns during training.[7,18] Students frequently rely on simplifying heuristics when navigating complex career environments.[19] Structured career counselling may facilitate systematic reflection, balanced specialty exposure and value clarification consistent with contemporary life-design approaches.[20] Structured undergraduate career guidance may also intersect with broader workforce planning considerations. Early reflective scaffolding may complement examination-based allocation systems by supporting informed specialty alignment, with potential implications for long-term professional sustainability.[21]

In response to this identified gap, we developed the India–Seed–Sprout–Sapling (I3S) framework, a staged model for supporting career decision-making during undergraduate medical training (Figure 1). Grounded in Social Cognitive Career Theory, the framework aligns progressive stages of self-awareness, outcome clarification and goal consolidation with existing CBME mentorship and AETCOM reflective structures. By embedding structured reflection within routine institutional processes, the model seeks to transition career development from passive exposure to systematic guidance. From an implementation perspective, the framework emphasises feasibility within existing institutional structures, enabling

scalable integration without requiring additional curricular time or dedicated counselling infrastructure. Although developed within the context of Indian undergraduate medical education, the staged structure of the I3S framework is conceptually adaptable to other health professions training environments where structured career exploration during training remains limited. The framework therefore provides a practical template for institutions seeking to integrate structured career reflection within existing mentorship or professional development curricula.

**Figure 1**

Future research should evaluate prospective implementation of structured career guidance interventions during undergraduate medical training. Work is currently underway to develop a web-based decision-support platform integrating psychometric assessment and cognitive profiling to assist students and mentors in structured specialty exploration. Such tools may provide measurable indicators of career preferences and decision-making processes, but their validity and educational impact will require rigorous evaluation.

### Implications for medical education

These findings highlight the importance of integrating structured career development opportunities within undergraduate medical training. Embedding staged career exploration activities within existing mentorship and reflective learning structures may support more informed specialty decision-making among students. The I3S framework offers a practical model for institutions seeking to incorporate structured career guidance without requiring major curricular restructuring.

### Strengths

This study has several strengths. It included participants from multiple institutions and across academic years, allowing examination of counselling demand across stages of training. The use of multivariable and ordinal regression modelling strengthened analytical rigour, and structured expert content validation enhanced the methodological credibility of the proposed framework.

### Limitations

This study has certain limitations. The findings are based on self-reported perceptions and may not directly translate into actual career decisions. However, perception-based needs assessments represent an important preliminary step in educational intervention design and help identify areas where structured curricular support may be most beneficial. The cross-sectional design precludes causal inference, and the sample was restricted to urban institutions, potentially limiting generalisability. Although the I3S framework demonstrated strong content validity, its effectiveness in improving measurable career outcomes requires prospective implementation and longitudinal evaluation.

## Conclusion

In summary, A substantial majority of undergraduate medical students perceived a need for structured institutional career counselling irrespective of demographic characteristics. Although career clarity increased progressively with academic training, demand for formalised guidance remained consistently high. These findings suggest that career decision-making currently develops largely through informal exposure rather than structured guidance. The proposed I3S framework therefore provides a structured conceptual model for integrating career development scaffolding within undergraduate medical curricula and offers a foundation for future implementation and evaluation studies.

# Declarations

### Ethics approval and consent to participate

The study involved a voluntary, anonymous questionnaire-based survey with no collection of identifiable personal data and minimal risk to participants. Electronic informed consent was obtained from all participants prior to completion of the survey. All methods were performed in accordance with relevant institutional guidelines and regulations. The Institutional Ethics Committee of Care Hospitals, Visakhapatnam reviewed the study and granted a waiver of formal ethical approval (IEC Ref No: 05/IECC/2026).

### Consent for publication

Not applicable.

### Availability of data and materials

The datasets used and analysed during the current study are available from the corresponding author on reasonable request.

### Competing interests

The author declares that there are no competing interests.


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### Author contributions

RY conceptualised the study, collected the data, conducted analysis and drafted the final manuscript.


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## Figures

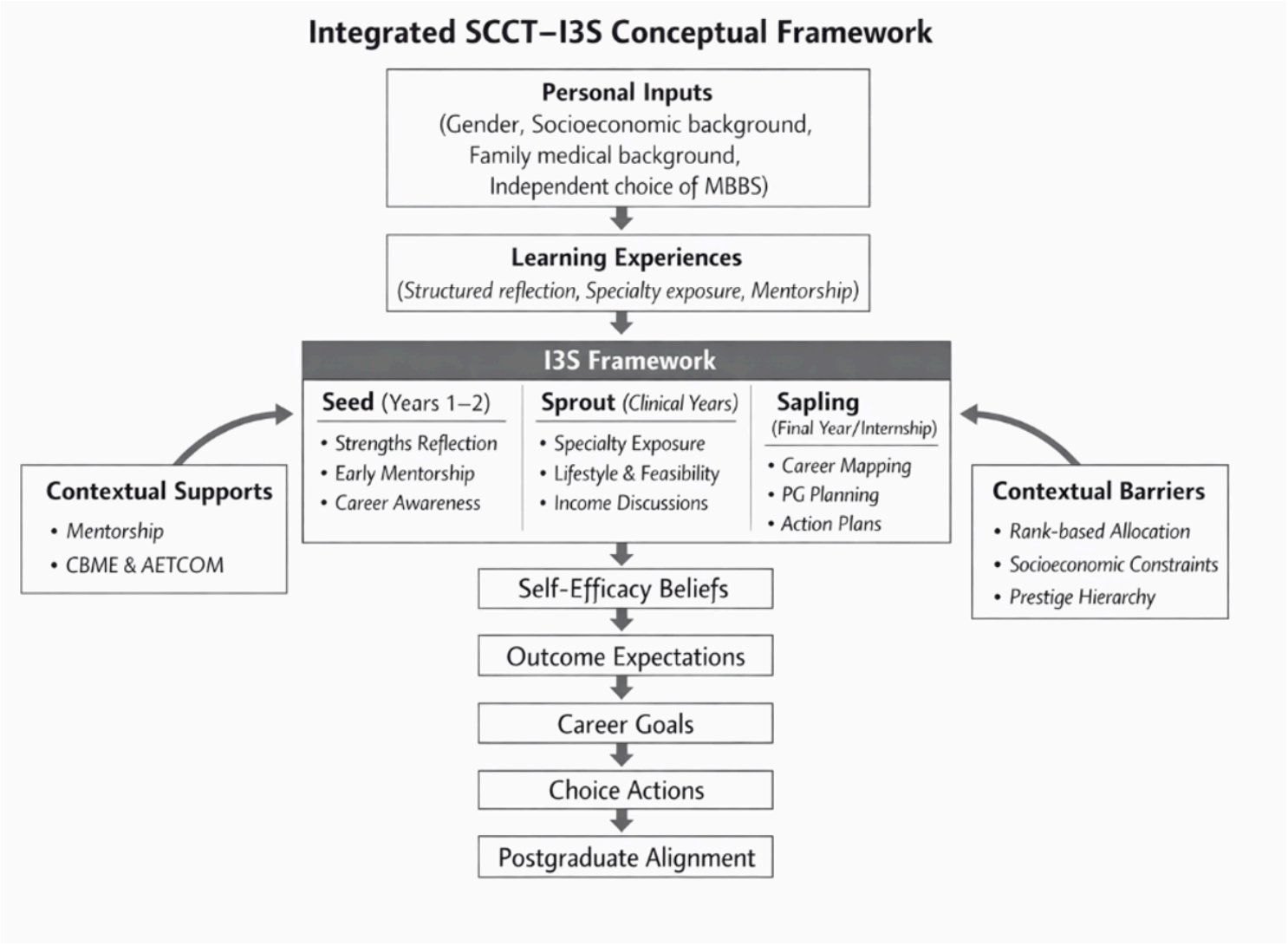



**Figure 1**

**Integrated Social Cognitive Career Theory (SCCT)–I3S conceptual framework for structured career development in undergraduate medical education.**

The diagram illustrates the conceptual integration of Social Cognitive Career Theory with the India–Seed–Sprout–Sapling (I3S) staged career development framework. Personal inputs (e.g. gender, socioeconomic background, family medical background and independent choice of MBBS) influence learning experiences such as structured reflection, specialty exposure and mentorship. These experiences are organised within the three developmental stages of the I3S framework: Seed (years 1–2), Sprout (clinical years) and Sapling (final year/internship). Contextual supports (mentorship, CBME and AETCOM reflective structures) and contextual barriers (rank-based postgraduate allocation, socioeconomic constraints and prestige hierarchy) interact with the framework. Through these processes, self-efficacy beliefs and outcome expectations shape career goals, influence choice actions and contribute to postgraduate specialty alignment.