

Original Research Article

Interest of rural youth of Medak district, Telangana, India towards the skill course of medical laboratory technician

Adepu Sai Sindhu¹, Nomula Ravi Varma^{1*}, Lalichetti Sagar², Metuku Devender Reddy¹

¹Dr. D. Rama Naidu Vignana Jyothi Institute of Rural Development Tuniki, Kowdipally, Medak, Telangana, India

²Department of Agronomy, M. S. Swaminathan School of Agriculture, Centurion University of technology and Management, Odisha, India

Received: 24 June 2026

Revised: 20 August 2026

Accepted: 24 August 2026

*Correspondence:

Nomula Ravi Varma,

E-mail: nomularavivarma@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: India's rapidly expanding healthcare diagnostics sector faces a critical shortage of qualified medical laboratory professionals, yet the Diploma in Medical Laboratory Technology (DMLT) remains poorly recognized among science students who could benefit most. This study assessed DMLT awareness, career preferences and enrolment-influencing factors among intermediate Bi.P.C students in rural Medak District, Telangana.

Methods: A cross-sectional survey was conducted from 26th November, 2024 to 30th January, 2025 using a validated questionnaire was administered to 486 Bi.P.C students from eight colleges in Medak District. The instrument covered demographics, academic interests, DMLT awareness, laboratory experience, career goals and enrolment intent (response rate: 100%). Data were analyzed using descriptive statistics, chi-square tests, logistic regression and a Random Forest classifier ($p < 0.05$).

Results: Only 38% of students had heard of DMLT; 30% had no knowledge and 20% showed no interest despite being aware. Although 93% expressed interest in medical science, nursing (83%), laboratory technology (62%) and pharmacy (31%) dominated career preferences. Prior laboratory experience was significantly associated with DMLT interest ($p < 0.05$). Long-term career goals ($\beta = +1.8$), Bi.P.C subject preference ($\beta = +1.6$) and career counselling ($\beta = +0.8$) were the strongest positive predictors; parental influence was negligible ($\beta = -0.4$). Random Forest classification achieved 83.7% accuracy ($F1 = 0.84$), with DMLT knowledge and lab experience as top features.

Conclusions: The principal barrier to DMLT enrolment is informational rather than motivational. Structured awareness sessions, laboratory demonstrations and periodic career counselling are recommended to convert existing medical science interest into DMLT-specific enrolment among rural youth.

Keywords: Bi.P.C students, Career awareness, DMLT, Medical laboratory technology, Medak district, Paramedical education, Rural youth, Telangana

INTRODUCTION

India's healthcare diagnostics sector is growing at a compound annual growth rate of 20.4% (IBEF, 2023), generating substantial demand for qualified medical laboratory professionals.¹ Globally, the World Health Organization (2021) has estimated a deficit of 2.4 million laboratory technologists, particularly acute in developing

economies.² Within this expanding landscape, the Diploma in Medical Laboratory Technology (DMLT) offers an accessible, relatively short training pathway that produces graduates capable of performing diagnostic procedures central to clinical decision-making.³ Despite its relevance, DMLT remains poorly visible as a career option. Intermediate Bi.P.C students in rural India typically aspire to MBBS or BDS programmes; when seats in these competitive courses are unavailable, many

students are left without a clear alternative direction. Studies indicate that awareness of allied health programmes is low even among students with strong science backgrounds and that career choices tend to reflect limited exposure rather than well-informed preference.⁴ The Healthcare Sector Skill Council (2024) has specifically identified a widening skills gap in medical laboratory technology across rural and urban settings alike.⁵ Medak District in Telangana presents a particularly relevant study context: eight intermediate colleges serve a predominantly rural student population whose exposure to paramedical career options is limited. Understanding what drives or inhibits interest in DMLT among these students is the first step toward targeted workforce development. The present study was therefore designed to assess the level of awareness about DMLT courses among intermediate Bi.P.C students in Medak District. Identify factors influencing career choices among Bi.P.C students. Analyze the relationship between laboratory experience and interest in pursuing DMLT. Develop recommendations for enhancing DMLT awareness among rural students.

METHODS

This cross-sectional study was conducted between 26th November, 2024 and 30th January, 2025. The students enrolled in intermediate Bi.P.C, in the ongoing academic batch at one of the eight government and aided colleges in Medak District, Telangana during the study period were considered eligible to participate in the study. Students who were not enrolled in the Bi.P.C stream, absent during the survey, declined participation or submitted substantially incomplete questionnaires were excluded from the study. However, prior DMLT awareness, laboratory experience and interest in DMLT were not used as selection criteria, as these were included as study variables. A total of 486 students were included using purposive sampling to ensure adequate representation across gender and college type. Ethical approval was obtained from the institutional review body and written informed consent was collected from all participants prior to data collection.

A structured, validated questionnaire was developed and administered in English after a pilot test with 20 students. The instrument covered six domains personal and demographic information, academic interests and subject preferences, awareness of the DMLT course and its career pathways, prior laboratory experience and enjoyment, career goals and perceived job stability and willingness to consider DMLT enrolment. The response rate was 100%. Quantitative data were analyzed using SPSS version (version 21.0). Descriptive statistics (frequencies, percentages) summarized awareness and preference distributions. Chi-square tests assessed associations between categorical variables including laboratory experience and DMLT interest. Binary logistic regression was applied to identify predictors of enrolment intent, with the outcome coded as interested versus not

interested. A Random Forest classifier (Python, scikit-learn) was additionally trained to determine feature importance and classification accuracy. Statistical significance was set at $p < 0.05$ throughout.

RESULTS

DMLT awareness

Awareness of DMLT was low across the sample (Table 1). Only 38% of students had heard of the course. A further 30% had no knowledge at all and 20% had encountered the term but developed no interest in it. Taken together, 50% of the sample lacked meaningful awareness. Only 12% were both aware of and interested in DMLT, confirming a substantial information gap even within a student cohort already oriented toward health sciences.

Career preferences

Sixty percent of students aspired to healthcare careers. Among specific options, nursing was the most frequently preferred (83%), followed by laboratory technology (62%) and pharmacy (31%) (Table 2). Both male and female students placed clinical, patient-facing roles above laboratory-based ones. This preference hierarchy suggests that visible clinical careers attract attention, while diagnostic roles remain less prominent in students' career imaginations despite their structural importance in healthcare delivery.

Laboratory experience and DMLT interest

Of the 486 students, 118 reported prior laboratory experience. This group consistently showed higher interest in DMLT than those without prior exposure. Among the 83% of students who reported enjoying laboratory activities, 25% described themselves as 'much interested' in DMLT. Chi-square analysis confirmed that the association between laboratory engagement and DMLT interest was statistically significant ($p < 0.05$). Approximately 70% of the sample had some form of prior lab exposure and this subgroup produced the highest DMLT interest scores across all analyses, identifying hands-on experience as a key modifiable predictor.

Key influencing factors

Table 3 presents the ranked impact scores of factors influencing DMLT interest, derived from logistic regression and Random Forest modelling. Long-term career goals, career counselling and prior lab experience emerged as the three highest-ranked predictors (Impact scores > 0.80). Medical science interest and Bi.P.C subject preference followed closely. Parental influence and short course duration ranked lowest (0.20), indicating that family persuasion is an unreliable lever for promoting DMLT uptake.

Logistic regression

Long-term career goals ($\beta=+1.8$) and Bi.P.C subject preference ($\beta=+1.6$) were the strongest positive predictors, each approximately doubling the likelihood of expressing DMLT enrolment intent (Table 4). Career counselling made a moderate positive contribution ($\beta=+0.8$). Parental influence had a slight negative effect ($\beta=-0.4$) with high standard error, implying inconsistency across the sample. Taken together, the model points toward career goal clarity and structured guidance as the most productive intervention targets.

College-wise variation

Average DMLT interest scores ranged from 1.0 (TSJC Kaushik) to 3.2 (TGVC Narsapur) across the eight colleges studied (Table 5). Institutions with higher

interest scores, such as SVJC Siddipet (mean 3.1; 62% interested), likely benefit from stronger laboratory facilities or more active in-college career guidance. Colleges at the lower end represent clear priority sites for targeted awareness interventions.

Primary motivators for DMLT

Among students who expressed interest in DMLT, medical technology interest was the dominant motivator (68%; $n=284$), far exceeding job prospects (20%), career growth (14%), breadth of career options (8%), short course duration (5%) and parental influence (3%) (Table 6). The dominance of intrinsic interest over external incentives reinforces the case for awareness campaigns that directly connect existing enthusiasm for medical science to DMLT as a specific, structured career pathway.

Table 1: DMLT awareness levels among intermediate Bi.P.C students in Medak District (n=486).

Awareness categories	(%)	Description
Heard of DMLT	38	Students who were aware of the course
W	30	Students with no exposure or information about DMLT
Heard but no interest	20	Students aware of DMLT but not motivated to pursue it
Aware and interested	12	Students who expressed willingness to consider DMLT

Table 2: Healthcare career preferences among Bi.P.C students (n=486).

Healthcare career	% of Students	Observation
Nursing	83	Most preferred; patient-facing clinical role
Laboratory Technology	62	Second preference; aided by prior lab experience
Pharmacy	31	Moderate preference; linked to proximity to medicine

Table 3: Ranked impact scores of factors influencing DMLT interest.

Influencing factors	Impact score	Significance
Long-term career goals	>0.85	Strongest predictor of DMLT interest
Career counselling exposure	>0.82	Structured guidance markedly increases enrolment intent
Prior lab experience	>0.80	Converts general medical interest into DMLT-specific intent
Medical science interest	0.65–0.70	High general affinity; needs DMLT-specific channelling
Bi.P.C subject preference	0.60–0.65	Science orientation supports DMLT readiness
Parental influence	0.20	Weakest factor; institutional efforts more effective
Short course duration	0.20	Minimal motivator; career quality prioritised over speed

Table 4: Logistic regression coefficients for predictors of DMLT interest.

Predictors	Coefficient	Std. error	Interpretation
Long-term career goals	+1.8	Low	Strongest positive predictor
Bi.P.C subject preference	+1.6	Low	Nearly doubles enrolment likelihood
Career counselling	+0.8	Medium	Moderate uplift; intervention-responsive
Parental influence	−0.4	High	Slight negative drag; high variability

Table 5: College-wise average DMLT interest scores and proportion of interested students.

Colleges	Avg. interest score	% interested students	Rank
TGVC Narsapur	3.2	65	1st
SVJC Siddipet	3.1	62	2nd
GVJC Gajwel	2.9	58	3rd
TGVC Kulcharam	1.8	—	—
TSJC Kaushik	1.0	41	Lowest

Table 6: Primary motivating factors for pursuing DMLT among interested students.

Motivating factors	% strongly motivating	No. of students (n=486)
Medical technology interest	68	284
Job prospects	20	89
Career growth opportunities	14	67
Breadth of career options	8	37
Short course duration	5	24
Parental influence	3	14

DISCUSSION

The most striking finding of this study is the mismatch between students' high general interest in medical science (93%) and their low specific awareness of DMLT (38%). This gap is not a product of disengagement but of inadequate information. A large proportion of Medak's Bi.P.C students are genuinely motivated toward health careers, yet they have not been introduced to DMLT as a viable, structured pathway. Similar patterns have been documented in the medical laboratory science literature, where diagnostic careers are frequently described as 'hidden' from public understanding because they are not patient-facing.^{6,7} Personal interest and perceived nature of work tend to be stronger career determinants than background characteristics alone, which is consistent with nursing's lead over laboratory technology despite the latter's comparable career prospects.^{8,9}

The consistent association between practical laboratory exposure and higher DMLT interest is one of the most actionable findings here. Students who had prior lab experience and those who enjoyed laboratory activities both scored significantly higher on DMLT interest measures. This aligns with evidence from science education research that experiential learning strengthens career self-efficacy and sustains interest in science-related pathways.¹⁰ Social cognitive career theory provides a useful explanatory lens: when students can imagine themselves in a laboratory role, the career becomes concrete and achievable rather than abstract.^{11,12} Even brief exposure events, such as single-session demonstrations, appear capable of shifting this calculus meaningfully. The regression and machine learning results move the analysis from description to prediction and in doing so make the findings policy relevant. The Random Forest model's 83.7% classification accuracy, driven primarily by DMLT knowledge and lab experience, demonstrates that enrolment intent is largely predictable from modifiable factors rather than fixed demographic traits. This is important because it means interventions, not selection, can shift outcomes. The logistic regression corroborates this: long-term career goals and subject preference are strong drivers that can be engaged through structured career counselling, which itself shows a meaningful positive coefficient. The weak and Alnajjar HA, Abou Hashish EA. Exploring the

effectiveness of the Career Guidance and Counseling Program on the perceived readiness for the job market: a lived experience among nursing students. *Frontiers in public health*. 2024 Oct 22;12:1403730.inconsistent role of parental influence further supports a shift toward institutional rather than family-mediated outreach strategies. College-wise variation in DMLT interest scores reflects differential access to laboratory resources and career guidance rather than any intrinsic difference between student cohorts. Colleges scoring lower represents addressable gaps. The rural context of Medak District amplifies these inequities: students in underserved areas have both lower access to career information and fewer opportunities for the kind of hands-on exposure that our data show to be pivotal.¹³ However, the present study was limited by its cross-sectional design, purposive sampling and inclusion of students from only eight colleges in a single district. Further, the self-reported responses and assessment of DMLT interest rather than actual enrolment may limit the generalizability of the findings.

CONCLUSION

This study demonstrates that the principal barrier to DMLT enrolment among rural Bi.P.C students in Medak District is informational rather than motivational. Students want healthcare careers but have not been introduced to DMLT in a way that makes it a real option. A three-component intervention model is recommended: structured awareness sessions in intermediate colleges led by practising laboratory technologists; short hands-on laboratory demonstrations that directly link intermediate science activities to DMLT career competencies; and periodic career counselling sessions, prioritised at colleges with currently low interest scores, that explicitly connect long-term career goals with the role and prospects of medical laboratory technology.

Future studies should include larger, multi-centre samples across different districts using longitudinal designs and evaluate whether targeted career counselling and DMLT awareness interventions lead to actual enrolment.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. India Brand Equity Foundation. Healthcare sector in India. India Brand Equity Foundation; 2023. Available at: <https://www.ibef.org/industry/healthcare-india>. Accessed on 21 January 2026.
2. World Health Organization. Laboratories and diagnostics. WHO; 2021. Available at: <https://www.who.int>. Accessed on 22 February 2026.
3. Chaturvedi S, Gupta R, Singh H, Kumar S. Emerging landscape of medical laboratory science in India: promises and opportunities. *EAS J Pharm Pharmacol*. 2023;5:113-21.
4. Kumar A, Rao P, Reddy M. Career decision-making among Bi.P.C students in Telangana: awareness and influencing factors. *J Health Sci Educ*. 2022;6(2):45-52.
5. Healthcare Sector Skill Council. Skills gap report: medical laboratory technology. HSSC. 2024.
6. Dignos PN, Khan A, Gardiner-Davis M, Papadopoulos A, Nowrouzi-Kia B, Sivanthan M, et al. Hidden and understaffed: exploring Canadian medical laboratory technologists' pandemic stressors and lessons learned. *Healthcare*. 2023;11(20):2736.
7. Linder R. Educating medical laboratory technologists: revisiting our assumptions in the current economic and health-care environment. *J Microbiol Biol Educ*. 2012;13(2):150-4.
8. Schwartz L, Cymrot C. Factors influencing medical laboratory science career choice amid the COVID-19 pandemic. *J Allied Health*. 2021;50(4):284-91.
9. Boamah SA, Kalu ME, Havaei F, McMillan K, Belita E. Predictors of nursing faculty job and career satisfaction, turnover intentions and professional outlook: a national survey. *Healthcare*. 2023;11(14):2099.
10. Hidi S, Renninger KA, Krapp A. Students who demonstrate strong talent and interest in STEM are positively influenced by hands-on research experiences. *CBE Life Sci Educ*. 2014;13(1):11-22.
11. Wang D, Liu X, Deng H. The perspectives of social cognitive career theory approach in current times. *Front Psychol*. 2022;13:1023994.
12. Alnajjar HA, Abou Hashish EA. Exploring the effectiveness of the Career Guidance and Counseling Program on the perceived readiness for the job market: a lived experience among nursing students. *Front Publ Heal*. 2024;12:1403730.
13. Guenther GA, Shahrir SF, Skillman SM, Kundu I, Garcia E, Frogner BK. Career pathways into the medical laboratory workforce: education, exposures and motivations. *Am J Clin Pathol*. 2025;163(4):545-80.

Cite this article as: Sindhu AS, Varma NR, Sagar L, Reddy MD. Interest of rural youth of Medak district, Telangana, India towards the skill course of medical laboratory technician. *Int J Community Med Public Health* 2026;13:5152-6.