



Medical post graduate's perspectives on mandatory residency training in the healthcare delivery system: an explanatory sequential mixed method study

Chaithra S^{1*}, Riyaz Basha S², Kishore S³, Saraswathi S^{4*}, Ranganath T S⁵, Nazeer Dhaheera Dheeshan⁶, N G Pradeep Kumar⁷, Basavalingayya⁸

ABSTRACT

Background

District Residency Program (DRP) is a mandatory three-month training program as a part of academic curriculum for all postgraduate medical students-(MD/MS) in India and implemented from 2021-batch onwards. DRP is implemented to bridge the gap between medical education and dynamic needs of healthcare delivery at district level. For that, doctors must be trained in diverse settings including those which are close to the community. Assessing the perception of postgraduate students and to identify challenges for the improvement of this new initiative is crucial.

Methods

A mixed-method study was conducted in Bangalore Medical College and Research Institute from July-2023 to January-2024. The first batch who underwent DRP were surveyed, with a sample size of 208; determined based on pilot study. Data was collected using simple-random-sampling and analysed via SPSS-26.0.

Results

Majority belonged to 27-30 years (61.2%) and 64.60% were males, they preferred their own transport (55%) for travel, 47.8% travelled a distance of about 5-14 km/day. Participants agreed healthcare exposure facilitated learning (57.7%) and DRP activities enhanced their basic OPD skills (69.3%), though 67.3% disagreed on DRP's effectiveness in orienting national health programs, 82.7% agreed that DRP postings helped in reducing stress.

Conclusion

Post-graduates viewed DRP as an opportunity for comprehensive learning with positive perceptions on health system exposure. While the program aids in national health orientation, challenges like time constraints and academic impact persist. Suggestions for improvement include rotational posting in diverse health settings for equal exposure and emphasized the need for accommodation and financial support to enhance program's effectiveness.

GJMEDPH 2024; Vol. 13, issue 5 | OPEN ACCESS

1&4*Corresponding author: Chaithra S, Junior Resident, chaithra.snp6295@gmail.com; 4. Saraswathi S, Assistant Professor, ssdrsaras@gmail.com; 2. Riyaz Basha S, Professor, drriyaz@gmail.com; 3. Kishore S, Assistant Professor, dr.kishoregowda@gmail.com; 5. Ranganath T S, Professor, tsranga1969@gmail.com; 6. & 7. Nazeer Dhaheera Dheeshan, N G Pradeep Kumar, Senior Resident, dhaheera@gmail.com; 7. ngpkpsm23@gmail.com; 8. Basavalingayya, Post Graduate, basavapsm@gmail.com, Department(s) and institution(s): (1-6) Department of Community Medicine, Bangalore Medical College and Research Institute

Conflict of Interest—none | Funding—none

Ethical Committee approval: The study was approved by the Institutional Ethics Committee of Bangalore Medical College and Research Institute (IRB number: BMCRI/EC/15/23-24)

© 2024 The Authors | Open Access article under CC BY-NC-ND 4.0



INTRODUCTION

The district residency program concerning Medical Post graduate students was notified vide Gazette dated 16th September 2020 by Medical Council of India (MCI) (1). The Gazette-of-India, Post-graduate Medical Education Regulations (PGMER)-2020; in sub-clause 13 under DRP preamble, mentioned that two essential tenets of postgraduate medical training are: learning experiences have to be derived from and targeted to the needs of community and the doctors have to be trained in diverse settings (2). The mandatory three-month training program, initially amended by the MCI in 2020, faced delays due to the COVID-19 pandemic. Clarifications on implementation were issued on 19th January 2023 and implemented from 2021 batch onwards (3). According to the gazette of India, National-Medical-Commission (NMC)-PGMER stated on 29th December 2023, under chapter 5, the objective of the DRP includes exposure of post graduates (PGs) to the intricacies of District Health Systems, familiarizing them with the planning and execution of the National Health Programmes at the district level, and orienting them to a spectrum of healthcare services provided under the National Health Mission. Post-graduate medical students play an integral role by actively contributing to the strengthening of District Health Systems as vital members of district teams. Training under District hospitals will provide fresh perception on working under resource-limited environments which helps in gaining knowledge, improving practical skills for future endeavours. DRP being in its initial phase, the present study was conducted with an objective to assess the Perception of post graduate students and to identify challenges as well as scope for improvement towards the sustainability of the program. The outcome of the study will be the baseline data for the concerned authorities to ensure further modifications and innovations for the upcoming DRP. (4,5,6)

Methodology

A cross sectional explanatory sequential mixed method study was conducted to assess the perception of postgraduate students on the district residency program and to determine the associated factors for improving the DRP. Data were collected from postgraduate students at Bangalore Medical College and Research Institute and Kempegowda Institute of Medical Sciences, Bengaluru, over a period of six months, from July 2023 to January 2024.

Sample size

A pilot study was conducted among the post graduates of Bangalore Medical College and Research Institute (Government) and Kempegowda Institute of Medical Sciences (Private). Based on the pilot study, by assuming equal proportion of variance and considering the proportion of Post graduate students (67%) who agreed for the objective statement – “DRP aided in orientation of promotive, preventive, and curative services provided under national health programmes”, sample size was calculated applying formula, $n = Z^2 p(1-p)/d^2$ with the standard table value for a 95% confidence interval (1.96) and the relative precision (10% of the p). After adding 10% attrition to the initial sample size of 189.21, the final sample size was rounded to 208.

Methodology of data collection:

After obtaining the clearance from the Institutional Ethics Committee and approval from the nodal officer, postgraduates posted at various health care facilities in Bengaluru and who were willing to participate and provided informed consent were enrolled in the study. The required sample (n=208) was initially selected using population proportionate to size sampling. In the second stage, from the obtained samples of the PPS, simple random sampling was conducted using a random number generator (Table 1).

Table 1: Population Proportional to Size Sampling

Departments	Branches	Government	Private	Total	PPS samples (6o%)
Anatomy	Pre-clinical	3 (1.14)	0	3 (0.86)	2 (0.96)
Physiology		3 (1.14)	0	3 (0.86)	2 (0.96)
Biochemistry		3 (1.14)	0	3 (0.86)	2 (0.96)
Microbiology	Para- Clinical	5 (1.90)	0	5 (1.44)	3 (1.44)
Forensic Medicine		5 (1.90)	0	5 (1.44)	3 (1.44)
Pharmacology		9 (3.42)	2 (2.38)	11 (3.17)	7 (3.36)
Pathology		10 (3.80)	7 (8.33)	17 (4.89)	10 (4.80)
Community Medicine		6 (2.28)	3 (3.57)	9 (2.59)	5 (2.40)
Dermatology		7 (2.66)	5 (5.95)	12 (3.45)	7 (3.36)
Radiology		14 (5.32)	6 (7.14)	20 (5.76)	12 (5.76)
Psychiatry	Medical / non-surgical	5 (1.90)	2 (2.38)	7 (2.01)	4 (1.92)
Internal Medicine		32 (12.16)	10 (11.90)	42 (12.10)	25 (12.01)
Pulmonary Medicine		8 (3.04)	2 (2.28)	10 (2.88)	6 (2.88)
Pediatrics		17 (6.46)	9 (10.71)	26 (7.49)	15 (7.21)
General Surgery		28 (10.64)	10 (11.90)	38 (10.95)	23 (11.05)
Orthopedics		15 (5.70)	6 (7.14)	21 (6.05)	13 (6.25)
OBG		23 (8.74)	7 (8.33)	30 (8.64)	18 (8.65)
ENT	12 (4.56)	3 (3.57)	15 (4.32)	9 (4.32)	
Ophthalmology	26 (9.88)	4 (4.76)	30 (8.64)	18 (8.65)	
Anesthesia	32 (12.16)	8 (9.52)	40 (11.52)	24 (11.53)	
Total		263	84	347	208

After obtaining informed consent, quantitative data was collected using a pre-tested, semi-structured questionnaire containing socio-demographic details and questions on- objectives, perception, sustainability, lacunae of DRP and suggestions for improvement of DRP by self-administered method. 3-point Likert’s scale was used for assessing the responses of the study participants. Data was entered in the Microsoft Excel and analysed using SPSS version 26.o. Principal Component Analysis (PCA) was employed to identify key variables that explain the highest variance in quantitative dataset, thereby reducing its dimensionality and streamlining it for further qualitative analysis.

Qualitative data was collected through four focus group discussions (FGDs) among DRP Postgraduates who had successfully completed their DRP postings. Each FGD consisted of 6-12 members who were informed in advance about the date, time, and venue. After obtaining verbal consent, FGDs were conducted by three individuals: the Principal Investigator (facilitator), the recorder and the observer/note taker and each session lasted for 30 to 40 minutes.

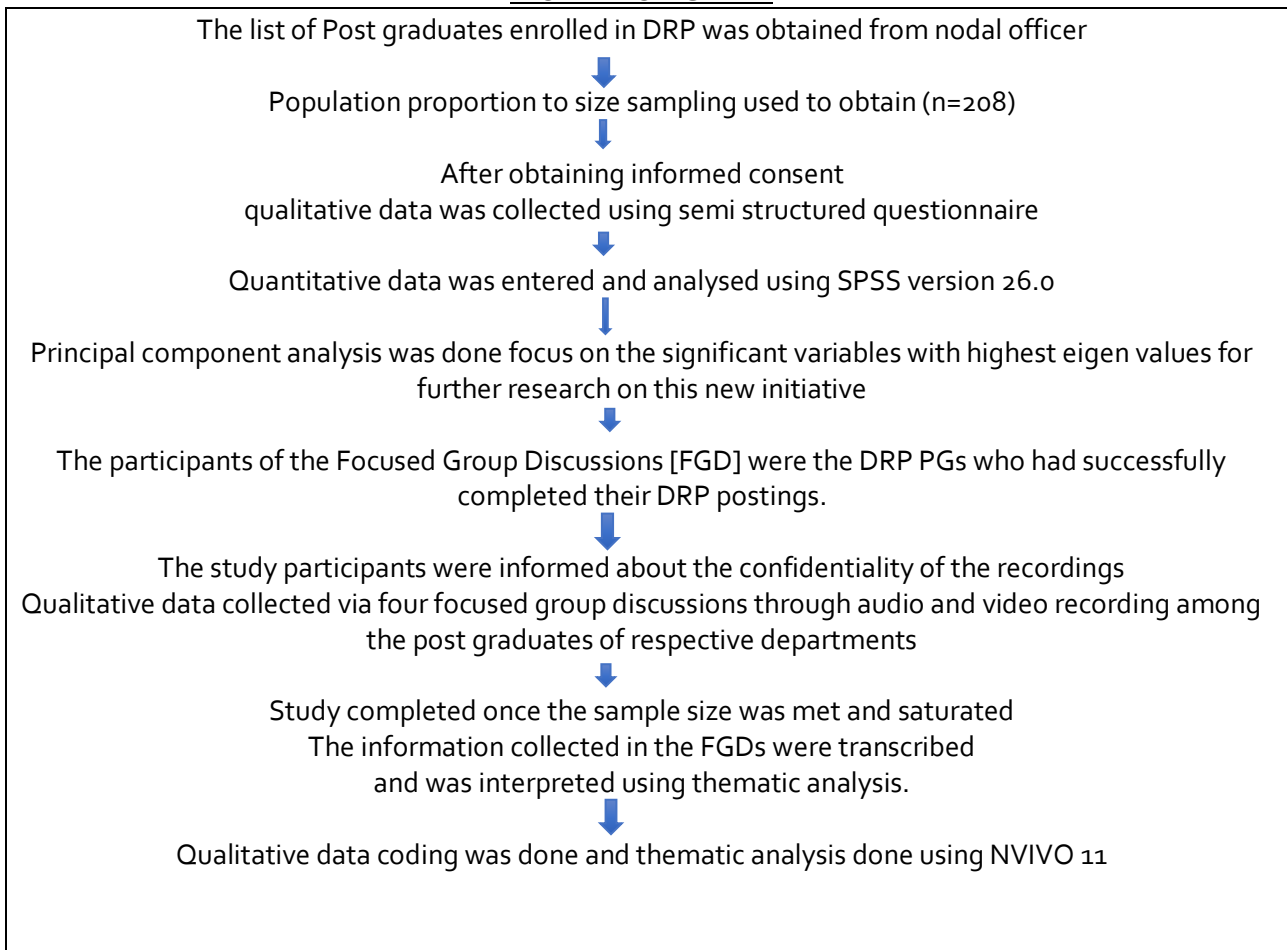
Participants were informed about the confidentiality of the recordings, which were done using a mobile gadget. The information collected in the FGDs was transcribed and analysed using



thematic analysis. Qualitative data coding and thematic analysis were done using NVIVO 11. The study was completed once the sample size was met and data saturation achieved. Qualitative data was presented using descriptive statistics, themes, and verbatim quotes.

After qualitative analysis revealed thematic insights, by integrating these results with the quantitative patterns led to a cohesive interpretation. This approach strengthened the overall analysis by providing a more comprehensive understanding of the research topic.

WORK FLOWCHART



Results

The majority of participants (76.40%) were from Bangalore Medical College and Research Institute, and the remaining (23.60%) from Kempegowda Institute of Medical Sciences. Mean age of our study participants was 28, with

Standard Deviation (SD) of ±3.74 and 64.60% of the respondents were male. Own transport was the preferred mode (55%) of transportation. Majority of the participants (47.80%) travelled on an average between 5-14 Km. (Table 2).



Table 2: Socio-Demographic Distribution of Study Participants

Socio demographic details	Variables	Frequency	Percentage
Type of PG seat	Government	174	(83.30%)
	Private	34	(16.70%)
Age	23-26 Years	66	(16.70%)
	27- 30 Years	127	(61.2%)
	> 31 Years	15	(7.20%)
Gender	Male	134	(64.60%)
	Female	74	(35.40%)
Marital status	Unmarried	154	(74.20%)
	Married	54	(25.80%)
Do you have children	Yes	18	(8.70%)
	No	190	(91.30%)
Mode of transportation	Public Transport	94	(45%)
	Own Transport	114	(55%)
Travel distance	< 5 Km	65	(31.10%)
	5-14 Km	100	(47.80%)
	15-24 Km	33	(15.80%)
	> 25 Km	10	(5.30%)

Details of out-of-pocket expenditure is given in Fig.1.

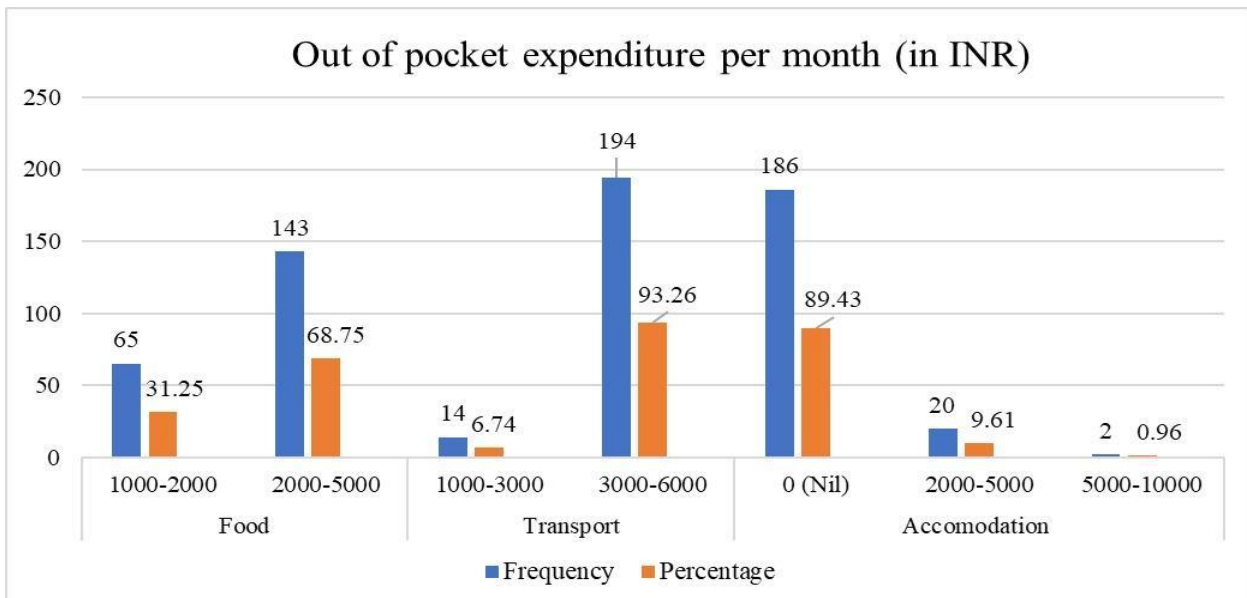


Figure 1: Distribution of Out-of-Pocket Expenditure per month (in INR)

While 57.7% of postgraduates found DRP postings helpful for learning, the majority (67.3%) disagreed regarding the program's effectiveness in orienting them towards national health

programs (Table 3). However, 76% reported improved basic professionalism through DRP postings, and also remarkably reduced their stress levels.



Table 3: Distribution of Responses on Postgraduates' Perspectives on DRP

Opinion on objective fulfilment		Disagree	Neutral	Agree
Exposure to the District hospitals/PHC/CHC - involving in health care services being provided helped in learning while serving		26 (12.5%)	62(29.8%)	120 (57.7%)
Exposure to various activities under DRP has enhanced your knowledge, improved your decision-making skills to tackle emergencies		16 (7.6%)	48(23.1%)	144 (69.3%)
DRP aided in orientation of promotive, preventive & curative services provided under national health programmes		140 (67.3%)	53(25.5%)	15 (7.2%)
Soft skills	Perception	Disagree	Neutral	Agree
Adaptability	Sensitization of post graduates at the grassroot level helped in improving patient care	34 (16.3%)	59 (28.4%)	115 (55.3%)
Time management	Availability of post graduates of various specialization has justified its role in improving the attendance, timely care of patients	38 (18.3%)	45 (21.6%)	125 (60.1%)
Communication	Patient interaction, compliance and follow up during DRP postings is better than in the working institute	50 (24%)	65 (31.3%)	93 (44.7%)
Critical thinking	Working in a resource-limited environment has widened your perspectives	57 (27.4%)	7 (34.1%)	80 (38.5%)
Emotional Stability	DRP posting has reduced the stress and anxiety among post graduates	6 (2.8%)	30 (14.4%)	172 (82.7%)
Professionalism	DRP has improved your basic OPD skills to provide overall health care services, not only your field of specialization.	21 (10.1%)	29 (13.9%)	158 (76%)
Teamwork	I have learnt to delegate responsibility and work efficiently as a team	21 (10.1%)	64 (30.8%)	123 (59.1%)
Sustainability		Disagree	Neutral	Agree
DRP is time consuming and deviation from PG curriculum and departmental activities		74 (35.4%)	58 (27.8%)	77 (36.8%)

The shortage of 3-months of training at parent institute shall surely affect teaching-learning opportunity.	39 (28.3%)	54 (25.8%)	96 (45.9%)
Lacunae	Disagree	Neutral	Agree
The district residents additionally need to keep in touch with the parent department for planned departmental activities	28 (13.4%)	45 (21.5%)	136 (65.1%)
Posting PGs for DRP is affecting the departmental activities and burdening the departments.	45 (21.5%)	55 (26.3%)	109 (52.1%)

*DRP: District Residency Programme

*PHC: Primary Health Centre

*CHC: Community Health Centre

Principal Component Analysis:

Principal Component Analysis (PCA) was employed to identify key variables that contributed most significantly to the variation observed in the dataset. The Kaiser-Meyer-Olkin (KMO) test resulted in a KMO value of 0.899 which indicates degree of sampling adequacy among the variables that have a strong partial correlation. Bartlett’s test of Sphericity with p value <0.005 confirms significant intercorrelations among variables.

The results of Principal-Component-Analysis are indicative of data suitability for factor analysis. These identified key variables were subsequently used in focussed group discussions, to gain deeper insights into their underlying reasons and perspectives. The first five components related to perception, challenges, advantages, suggestions, and knowledge regarding the DRP with higher eigen values (>1) were prioritized for further exploration to capture the variability within the data. (Figure .2)

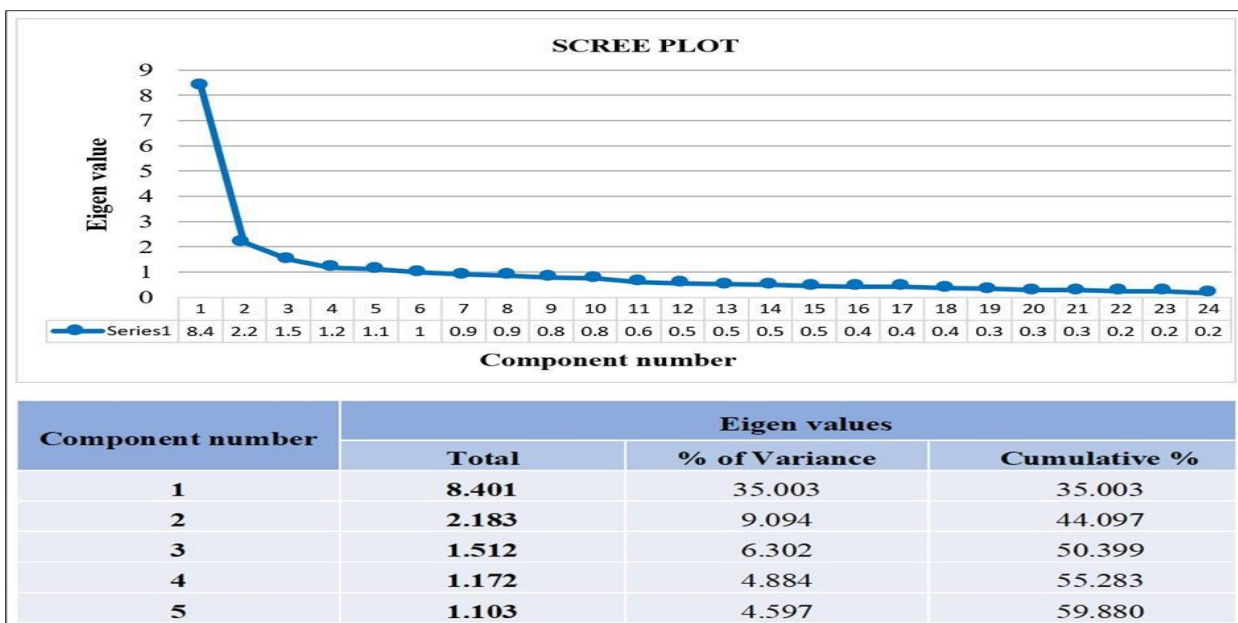


Figure 2: Screen Plot with Significant Eigen Values

Focused Group Discussion:

Thematic analysis of the transcripts was conducted manually by the first author, with samples cross-checked by other authors. An inductive approach ensured through

identification of all themes. Final themes were discussed among authors and categorized into main and sub themes based on relevance to the research shown in (Table 4).

Table 4: Thematic Analysis Table of Focused Group Discussion Transcripts

THEMES	CODES	RELATED VERBATIMS
<p><u>Theme - 1:</u> Knowledge on DRP</p>	<ul style="list-style-type: none"> • Objectives • Roles & responsibilities • Updates 	<p>“The exposure of the postgraduate student to the district health system.” “Served in outpatient, inpatient, casualty, and other areas related to specialty too.” “Regarding national programs, it was helpful actually, even I have participated in camps where national programs related activities were going on.” “We should know the latest guidelines recent updates; it has helped us get an overview of public health activities”</p>
<p><u>Theme - 2:</u> Perception towards DRP</p>	<ul style="list-style-type: none"> • Working in resource limited environment • Learning experience 	<p>“Better availability of medications and basic investigations should be provided at health care facility for timely care of patients. Even the minor cases will be referred - as there is lack of instruments and facilities.” “Participation in outreach-camps, health education, surveys, immunization week, we are more focused on treatment in clinical courses, DRP essential for a preventive aspect.”</p>
<p><u>Theme - 3:</u> DRP advantages</p>	<ul style="list-style-type: none"> • Exposure to National Health Programmes • Telemedicine exposure • Reduced anxiety and stress 	<p>“Oriented us towards Planning and monitoring and got to know about the national health programs.” “Posted in smart virtual clinic for DRP postings,” “Telemedicine is good but hand to hand treatment and evaluation works better.” “DRP was a chill period for some time relatively like a break time from hectic workload, we can utilize it has an opportunity for self-improvement, reading and productivity.”</p>

<p><u>Theme - 4:</u> DRP challenges</p>	<ul style="list-style-type: none"> • Impact on Academics • Data collection interruption • Lack of multidisciplinary Approach 	<p>"We missed a lot of seminars and activities back in our parent College, staying away from the department for months affects our curriculum and also E-communication practically it is not feasible."</p> <p>"As my topic of dissertation is quite complex and availability of cases is very less, these 3 months have surely negatively impacted on my process of collection of data collection and completion of dissertation work."</p> <p>"Burden on departments due to reduced manpower," "We in DRP where there is no proper infrastructure and resources being underutilised as per our speciality where the PGs in dept are getting stressed by the additional workload, its quiet challenging to manage workloads as PGs will be out for DRP."</p>
<p><u>Theme - 5:</u> Overall opinion on DRP</p>	<ul style="list-style-type: none"> • Comprehensive growth • Opportunities for improvement • Accommodation • Financial support 	<p>"Good experience. Overall, this posting was helpful in comprehensive growth."</p> <p>"PGs should be allowed to participate in departmental academics during DRP postings."</p> <p>"Accommodation should be provided at least for the post graduates posted far from parent institute."</p> <p>"Travel allowance is not provided and food expenses are adding to the financial burden."</p>
<p><u>Theme - 6:</u> Suggestions for future DRP improvement</p>	<ul style="list-style-type: none"> • Exposure to diverse health setting • Speciality based OPD • Role specification • Rural awareness • Time duration for DRP posting 	<p>"Instead of posting us to one community centre for 3 months, it can be planned better to post us every month in diverse health settings in rotation."</p> <p>"Specialty based OPD / specialty clinic days rather than general OPD will be better, on particular days of the week for specialty care."</p> <p>"There is a need for clear role specifications for postgraduates during DRP postings."</p> <p>"Importance on rural awareness should be given to make the DRP experience more meaningful in a community setup."</p> <p>"It is better to shorten the duration of DRP posting."</p>

During focused group discussion, it was evident that few postgraduates who had a clear understanding of DRP objectives were more receptive to its implementation. They acknowledged the significance of community-oriented-training for addressing public healthcare emergencies, rather than solely prioritizing individual career advancement. The necessity for this initiative was recognized way before the COVID-19 pandemic, emphasizing the importance of fostering responsible doctors at the grassroots level for our country.

Discussion

The draft of Postgraduate Medical Education Regulations 2021 introduces the District Residency Programme (DRP), emphasizing learning experiences tailored to community needs (7). The editorial by Riyaz BS points out ongoing challenges, especially in Karnataka, related to the uneven distribution of medical colleges and postgraduate seats. It stresses the significance of linking medical colleges with district health systems and emphasizes the need for clear role delineation, especially in specialized branches, to enable effective subject-oriented training (8). Study done by Maroor PS et al emphasized the Government of Karnataka's initiative to expand postgraduate and super-speciality courses in district and taluk hospitals. Notably, Karnataka is pioneering the implementation of Diplomate of National Board (DNB) and Doctorate of National Board (DrNB) courses in taluk and district hospitals, respectively. Thus, this initiative aims to strengthen public hospitals, improve health indicators, and reduce the burden on tertiary care hospitals. The state plans to further streamline these courses at accredited government hospitals (9). While both initiatives aim to address the shortage of medical specialists and improve healthcare services at district levels, they differ in their approach and implementation strategies. Dharmshaktu G S in his letter to the editor mentioned that postgraduate training must include the ambitious "District Residency Programme," but lack of a three-month training program at parent institute affects teaching-

learning opportunities and academic progress (10). A SWOT analysis indicates that the DRP enables district residents to learn about prevalent diseases in their area and gain leadership skills by observing how local healthcare systems operate routinely (11). Similarly, in the current study 45.9% of post graduates find the three-month shortage adversely affecting academic progress. During the focused group discussions, participants expressed their concerns about missed departmental activities, interrupted thesis data collection timelines and impracticality of e-communication during clinical duties. TK Jena et al's study showed that IGNOU training model and DRP share similarities; suggesting that, including district hospitals in PG training can bridge the gap between academics and practitioners by infusing academic environment at district level and taking care of Continuing Medical Education (CME) by monitoring quality of training through supportive supervision and continuous assessment of activities via logbooks (12). The current study revealed insufficient PGs in the parent institute, resulting in increased workload and burden on remaining PGs. The shortage impeded workflow, compromised quality care and prolonged patient waiting time whereas placement of multiple PGs in district health centres may worsen underutilization issues. Intralawan D et al conducted a study that concluded that graduates were assigned to district hospitals as general practitioners (GPs); collaborating closely with regional primary care networks offers opportunity to educate oneself and perspectives between communities to deal with a variety of health concerns (13). Specialty-wise postings could enhance effectiveness, but diversifying placements offers exposure to a wide range of cases, contributing to a broader understanding of healthcare delivery. The study by Jain S regarding post-graduate perceptions of DRP revealed 64.7% of medical students were discontent towards its relevance in PG curriculum. 90.2% of students were dissatisfied with accommodation facilities (14). Study done by Raj A on DRP implementation revealed 17% of residents felt DRP objectives were fulfilled but expressed isolation from academic activities (60%) and dissatisfaction with

basic amenities (75%). Safety concerns were prevalent (80%) (15). The current study showed that 77.5% agreed that the DRP objectives were fulfilled while 69.6% find it challenging to accept DRP in already demanding curriculum, exposure to healthcare services aided in learning (46.4%), and reduced stress and anxiety (82.7%), there were notable disagreement regarding program's effectiveness in orienting towards National Health Programs and its relevance to the curriculum and also for basic food and transport facilities.

Limitation

Our study primarily involved postgraduates as a preliminary exploration. However, to ensure a more comprehensive understanding and to refine program implementation, further research among key stakeholders such as the district health department, medical education board, and institute directorate, deans, and department heads incorporating inputs is essential. This inclusive approach is pivotal for enhancing the overall effectiveness of the program.

Conclusion

In conclusion, postgraduates in the District Residency Programme have benefited from

healthcare exposure and skill enhancement. However, aligning medical colleges with the district health system with respect to the national health program orientation remains a concern. While DRP offers valuable learning opportunities and addresses manpower shortages, with significant progress in decision-making skills and stress reduction among district residents, challenges such as disruptions in academic progress and dissatisfaction with basic facilities need to be addressed. Suggestions for improvement include rotational posting in diverse health settings for equal exposure, and they emphasized the need for accommodation and financial support. Understanding and tackling these challenges are vital for improving the overall effectiveness and acceptance of the DRP.

Recommendation

Postgraduate orientation is crucial for DRP acceptance and program success. Clear regulations on accommodation, food, and transport are vital. Efficient rotation scheduling and optimizing postgraduate placement in higher-demand centres with adequate infrastructure are recommended for resource utilization and maintaining medical college functionality.

REFERENCES

1. NMC - Post Graduate Medical Education Board [PGMEB] - Implementation of District Residency Programme. 2022 Dec; 23(1)(25). Available from: <https://www.nmc.org.in/MCIRest/open/getDocument?path=/Documents/Public/Portal/LatestNews/MER.pdf>
2. NMC- Board of Governors in Supersession of Medical Council of India Notification Med./121415. The Gazette of India: Extraordinary Part III Sec.4. 2020 Sep; 18(1). Available from: <https://www.nmc.org.in/ActivitiWebClient/open/getDocument?path=/Documents/Public/Portal/Gazette/PGME-18.09.2020.pdf>
3. NMC Post Graduate Medical Education Board-Clarification on Implementation of District Residency Programme. 2023 Jan; 23(1)25. Available from: <https://www.nmc.org.in/MCIRest/open/getDocument?path=/Documents/Public/Portal/LatestNews/MER.pdf>
4. Yagnik B / TNN / Gujarat: NMC plans 3-month residency for PG students at District Hospitals: Ahmedabad news - The Times of India. TOI; 2021 Aug 6. Available from: <https://timesofindia.indiatimes.com/city/ahmedabad/nmc-plans-3-month-residency-for-pg-students-at-dist-hosps/articleshow/85081428.cms>
5. PTI / New Delhi: NMC makes district residency programme mandatory for MD, MS students. The Indian Express. 2022 Dec 27. Available from: <https://indianexpress.com/article/education/doctors-pursuing-md-ms-gets-mandatory-participation-for-district-residency-programme-8339928/>
6. Abraham R/ HT/ Chandigarh: District Residency Programme for medical students remains a non-starter in Chandigarh – Hindustan Times. 2023 Sep 13. Available from: <https://www.hindustantimes.com/cities/chandigarh-news/delayed-implementation-of-district-residency-programme-for-medical-pg-students-in-chandigarh-causes-concern-101690156398824.html>
7. S DRB. District Residency Programme: A Boon or A Bane. RGUHS National Journal of Public Health. 2023; 8(1). P(vi-vii). Available from: <https://rnjph.journalgrid.com/view/article/rnjph/12433581>. DOI: 10.26463/rnjph.8_1_2
8. Maroor PS, Pushpalatha BS, Kodkani S, Shruthi L, Ashwini D, Sharma A et al. Strengthening of District/Taluk Level Hospitals Through Implementation of Post-graduate Medical Courses in Karnataka, India. Indian J Community Med. 2024 Jan-Feb;49(1):11-17. Available from: <https://pubmed.ncbi.nlm.nih.gov/38425967/> doi: 10.4103/ijcm.ijcm_125_23.
9. Dharmshaktu G S. District Residency Program: Seeking Opportunity in the Disruption. Journal of Orthopaedic Diseases and Traumatology. 2023 Jan–Apr; 6(1): p 119. https://journals.lww.com/jodt/fulltext/2023/06010/district_residency_program_seeking_opportunity_in.23.aspx. DOI: 10.4103/jodp.jodp_77_22.
10. Dharmshaktu G S. District residency programme in India. Journal of Surgical Specialties and Rural Practice 2023 Jan–Apr; 4(1): p 1-2. Available from: https://www.researchgate.net/publication/370126842_District_Residency_Programme_in_India. DOI: 10.4103/jssrp.jssrp_15_22.
11. Jena TK. IGNOU Training Model and District Residency Programme. Journal of Advanced Research in Medical Science & Technology 2020; Vol.7(4):17-18. Available from: <https://medicaljournalshouse.com/index.php/Journal-MedicalSci-MedTechnology/article/view/460/360>.
12. NMC-National Medical Commission Postgraduate Medical Education Board - Draft Postgraduate Medical Education Regulations PGMER final draft (1) - New Delhi. 2021; 1.2. p 19-23. Available from: <https://www.nmc.org.in/MCIRest/open/getDocument?path=/Documents/Public/Portal/LatestNews/MER.pdf>
13. Intralawan D, Morikawa HC, Morikawa MJ, Porruan R. Focusing on the assets in our challenges: Family Medicine Residency Programme in Chiang Rai, Thailand [Internet]. U.S. National Library of Medicine 2020 Oct 15; v.8(4): e000500. Available from: <https://pubmed.ncbi.nlm.nih.gov/33060127/> doi: 10.1136/fmch-2020-000500.
14. Jain S, Garg S, Paliwal A, Fiza B, Shoaib M. Perception of Postgraduates towards District Residency Program: A Mixed Method Study. JCHR. 2023;13(6):2960-2965. Available from: <https://jchr.org/index.php/JCHR/article/view/2510>
15. Raj A, Singh S, Rathore M. Early evidence of implementation of District Residency Programme: experiences and challenges of residents in Rajasthan, India. BMC Med Educ. 2024; 24:493. <https://doi.org/10.1186/s12909-024-05489-w>