



# BMJ Open General practice residents' perspectives on their professional identity formation: a qualitative study

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## ABSTRACT

**Objectives** To move beyond professionalism as a measurable competency, medical educators have highlighted the importance of forming a professional identity, in which learners come to 'think, act, and feel like physicians'. This socialisation process is known as professional identity formation (PIF). Few empirical studies on PIF in residency have been undertaken. None of these studies focused on PIF during the full length of GP training as well as the interplay of concurrent socialising factors. Understanding the socialisation process involved in the development of a resident's professional identity and the roles of influencing factors and their change over time could add to a more purposeful approach to PIF. Therefore, we aimed to investigate the process of PIF during the full length of General Practice (GP) training and which factors residents perceive as influential.

**Design** A qualitative descriptive study employing focus group interviews.

**Setting** Four GP training institutes across the Netherlands.

**Participants** Ninety-two GP residents in their final training year participated in 12 focus group interviews.

**Results** Study findings indicated that identity formation occurs primarily in the workplace, as residents move from doing to becoming and negotiate perceived norms. A tapestry of interrelated influencing factors—most prominently clinical experiences, clinical supervisors and self-assessments—changed over time and were felt to exert their influence predominantly in the workplace.

**Conclusions** This study provides deeper empirical insights into PIF during GP residency. Doing the work of a GP exerted a pivotal influence on residents' shift from *doing* as a GP to thinking, acting and feeling like a GP, that is, *becoming* a GP. Clinical supervisors are of utmost importance as role models and coaches in creating an environment that supports residents' PIF. Implications for practice include faculty development initiatives to help supervisors be aware of how they can perform their various roles across different PIF stages.

## INTRODUCTION

Becoming a physician involves more than just the acquisition of knowledge and skills.<sup>1</sup> To move beyond professionalism as a measurable competency, medical educators have highlighted the importance of forming a professional identity.<sup>2–4</sup> Our identity—who

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This is the first study exploring the process of professional identity formation (PIF) during the full length of General Practice (GP) training as well as the interplay of concurrent socialising factors.
- ⇒ The researchers were able to include a relatively large and diverse group of residents, which made it possible to discern different perceptions on PIF.
- ⇒ The researchers used the conceptual framework of PIF developed by Cruess *et al* as a sensitising framework for designing the interview guide as well as for conducting the deductive part of the analysis, which added rigour to our study, while the exploratory approach left open the possibility of finding complementary factors and themes.
- ⇒ The researchers only interviewed participants once, asking them to look back on their PIF; hence, we might have missed subtleties in identity formation over time.
- ⇒ This study was limited to the GP context; therefore, transferability to other residency contexts may be limited.

we are—guides our behaviour. Our professional identity—who we are as professionals—guides our behaviour as professionals and is the cornerstone of professionalism.<sup>5</sup> This renewed emphasis on professional identity allows medical education to move away from 'an exclusive focus on *doing* the work of a physician towards a broader focus that also includes *being* a physician'.<sup>2</sup> Moreover, as both patients and physicians have come to believe that medicine's professionalism is under threat, medical educators have highlighted the importance of forming a professional identity aligned with the values and norms of the profession.<sup>6–9</sup>

Professional identity formation (PIF), defined as the development of professional values, actions and aspirations,<sup>10</sup> is a process happening at (1) the level of the individual, involving the psychological development of a person, and (2) the collective level, involving a socialisation process.<sup>2</sup> Through these



processes learners ultimately come to ‘think, act, and feel like physicians’.<sup>9 11 12</sup> Residency has often been identified as a key stage in PIF, as a more ‘permanent’ professional identity is formed during this stage of training, in which residents cross the boundary from students to practitioners and begin their journey towards independent practice.<sup>10 13 14</sup>

Whereas many studies have explored PIF in undergraduate medical education (UGME), little is known about PIF in postgraduate trainees.<sup>15–24</sup> The few empirical studies on PIF in postgraduate medical education (PGME) have explored clinical teachers’ perceptions of their role in PIF,<sup>6</sup> the role of autonomy in the PIF of internal medicine residents,<sup>14</sup> PIF in medical residents from different specialties<sup>13</sup> and PIF in General Practice (GP) settings.<sup>25 26</sup> The latter two focused on the supervisory relationship in a 12-week GP intern placement before residency<sup>25</sup> and on the alignment of previously defined family medicine constructs with PIF among first-year GP residents.<sup>26</sup> None of the five studies on PIF in PGME focused on the process of PIF during the full length of residency, as well as the interplay of concurrent socialising factors.

Understanding the socialisation process involved in the development of a resident’s professional identity and the roles of influencing factors and their change over time could add to a more purposeful approach to PIF.<sup>5 11 12 25</sup> For example, this could be an approach in which residents’ needs for support in PIF are acknowledged, the best means for forming a professional identity are sought, and supervisors and faculty members acquire tools for intervening in the process of PIF, if necessary. Moreover, fostering residents’ insights into both the process and the multiple factors involved in PIF may encourage them to be more proactive in forming a professional identity aligned with their own values and aspirations.<sup>3 9 11 14 25 27</sup>

We chose the unique context of GP training to study PIF in residency for two reasons. First, general practice plays an important gatekeeper role in healthcare, as the GP is the first ‘port of call’ for patients entrusted to them. Second, both the relationship between the GP resident and the patient and the relationship between the resident and the supervisor are long term. These relationships offer a valuable opportunity for the formation and support of a professional identity over an extended period of time.

In view of the sparse data on PIF in PGME, we aim to explore the process of PIF during GP residency and which factors GP residents perceive as influential.

## METHODS

### Study design and theoretical framework

We chose qualitative description as our research design as we wanted to stay close to the words of the participants and be as non-interpretative as possible.<sup>28</sup> We used an exploratory approach, from a constructivist perspective, implying that our view on reality is socially and experientially based and that multiple realities exist.<sup>29</sup> We

conducted focus groups with GP residents of four institutes across the Netherlands, which were purposefully sampled regarding GP practice site (rural vs urban). Because PIF is a social process,<sup>2</sup> we selected focus groups as our method for data collection to facilitate interaction between participants about influences, experiences and normative beliefs regarding PIF.<sup>30</sup>

We used the conceptual framework of PIF developed by Cruess *et al*<sup>11</sup> as a sensitising framework for designing the interview guide as well as for conducting the deductive part of the analysis. This model, which describes the gradual shift of learners from peripheral to full participation in a community of practice,<sup>9 11 12 31</sup> highlights a number of factors that interact with learners’ pre-existing identities, including clinical and non-clinical experiences and role models.<sup>11</sup> Learners have to negotiate the influence of these factors as their new identities are being formed.<sup>11</sup>

To appreciate different perspectives, we formed an interdisciplinary research team. VN is a health scientist, YS a clinical psychologist and WNVN works as an intensivist. The other authors are GPs. All are experienced educational researchers. We applied the Standards for Reporting Qualitative Research guidelines<sup>32</sup> (see online supplemental file 1).

### Context

Before enrolling in a Dutch specialist GP training programme, most recently graduated doctors work for some years in their field of interest to gain additional experience as a practising physician. GP residency training is offered at eight Dutch GP training institutes and consists of 3 years of workplace-based learning, combined with formal training activities in a university setting. In years 1 and 3 of the programme, GP trainees work in a general practice where they deliver outpatient care and where they are supervised by a senior GP. Year 2 of GP residency training consists of rotations in hospitals, nursing homes and psychiatric clinics, where GP trainees predominantly deliver inpatient care and where they are supervised by various supervisors. Trainees typically work 4 days a week in their training practice. On the fifth day, they participate in a ‘day release program’ staffed by GP faculty and behavioural science teachers. On these days—designed to facilitate and deepen learning from experiences in practice—residents learn in small groups (10–15 residents) about case histories, protocols and skills, with dedicated time for collaborative reflection and practical training. Residents’ progress towards standard performance is monitored three times a year using the Competency Assessment List (Compass), of which professionalism is an integral part.<sup>33</sup>

### Participants and procedure

We asked a contact person at four training institutes across the Netherlands — Leiden (Leiden University Medical Center), Rotterdam (Erasmus Medical Center), Maastricht (Maastricht University Medical Centre+) and

Groningen (University Medical Center Groningen) — to select existing training groups of residents in their final year. We selected these four institutes aiming for a purposeful sample of rural and urban GP practices, as both work content and processes, as well as socialisation processes, might differ in different kinds of GP practice sites.<sup>13</sup> We organised the focus groups at regular group meetings during the day-release programme at the university. Residents were asked to participate after informing them of the research goal, voluntary nature of the study and confidentiality. The main researcher (PB) moderated all focus groups, lasting approximately 1.5 hours. In each group, an educational researcher was present to observe interactions, take field notes and, if necessary, ask clarifying and deepening questions.

We used a semistructured interview guide (see online supplemental file 2) derived from the prevailing literature,<sup>2 4–9 11–19 21 24 25 27 34–38</sup> with an emphasis on the aforementioned conceptual framework<sup>9 11 12 31</sup> of PIF, and pilot interviews. This semistructured interview was not altered after piloting and the content of the guide was applied during all 12 interviews. All interviews were audiotaped and transcribed verbatim. Theoretical sufficiency was achieved after 8 out of 12 focus groups conducted.<sup>39</sup>

### Patient and public involvement

No patient was involved in this study.

### Analysis

We choose an abductive approach to analysis in which we integrated inductive data-driven coding with deductive theory-driven interpretation.<sup>40</sup> We conducted a thematic analysis in which, first, PB and VN performed inductive coding independently from each other.<sup>32</sup> Together they developed an initial codebook, which was then discussed with the team. Thereafter, in a deductive theory-driven approach, the inductively gathered codes were mapped onto the factors identified by Cruess *et al*<sup>11</sup> as sensitising concepts. During iterative discussions within the team and through comparison with relevant literature, relations between codes and factors were discussed and themes were constructed. During analysis, PB and VN kept memos to document coding and analysis. By taking a cyclical, interactive and reflective approach to data gathering, analysis and comparison with relevant literature, we ensured that theory was used in an exploratory way and that individual biases were reduced.<sup>41 42</sup>

## RESULTS

All selected training groups were willing to participate in this study. Twelve focus groups with 92 third-year GP residents at four training institutes across the Netherlands were conducted. Sixty-seven residents were female (73%).

Our analysis revealed three major themes, which together provided insight into the process of PIF among GP residents:

► It all happens in the workplace.

- From doing to becoming.
- Negotiating perceived norms.

In the following sections we describe these themes and delineate the influencing factors and their interplay, illustrated with quotes (identified by gender ('F' for female, 'M' for male) and interview number 'n').

### It all happens in the workplace

Residents reported that their professional identity primarily developed in the workplace. In their GP training practices, multiple interrelated factors, including clinical experiences, clinical supervisors and residents' self-assessment, were found to be at play in forming this professional identity. These factors and their interplay are explored below.

*Clinical experiences* were perceived as “the way towards becoming a GP” (F2). Residents repeatedly articulated that they became GPs by “just doing the work of a GP” (F6), as “practice makes perfect” (F5). Residents described that by “seeing many patients [and] gaining experience” (M11) in an increasingly independent way, they gradually moved to full participation in the GP training practice. This sense of full participation culminated during the independent clinical weeks, during which residents worked without the support of their supervisors. These weeks appeared to be important milestones in feeling like a GP, as they were said to “boost [their] self-confidence” (F5) and allowed residents to manage the GP practice independently.

[during the independent clinical weeks] you learn more about what is really going on in practice, because if you work together with your supervisor, he still catches quite a few things. When you are really alone, you get everything. So, then you just really feel like you are the spider in the web. (F3)

In addition to clinical experiences, residents saw their *clinical supervisors* as critically important to their PIF. Residents said their supervisors were essential in providing an environment in which they could feel free to “explore” (M11) what type of GP they wanted to become. “Personal chemistry” (F3, F4, F7, F8) and “being trusted” (F4, F6, F7) were frequently mentioned as prerequisites to “feeling free to try out” different GP styles (M11). Most residents saw their supervisors as “role models who bring about your formation” (F7) and indicated that closely “observing supervisors” (F5, M10) contributed to exploring what type of GP they wanted to become. Supervisors' confirmatory feedback about whether residents were on the right track towards becoming a GP was seen as very important in identifying with the community of GPs.

What helps me a lot is feedback by my supervisor ... him saying: ‘Well, this es exactly how a GP should do this’. (F4)

A third important ingredient influencing PIF, related to the workplace, was ‘self-assessment’. Residents tended to self-assess their professional development through “reflecting on [their] medical practice” (F5), in terms of whether they ran out of time, whether their patients were satisfied, whether their diagnoses and therapy were right—“checking your hypotheses” (F5)—and whether they were managing to cope with uncertainty. Residents also appeared to self-assess their PIF outside the workplace by comparing their own experiences in the workplace with “the stories and experiences of [their] peers” (F2) during the day-release programme.

### From doing to becoming

Residents observed that over the years of training, their identity formation reflected their move from *doing* the work of a GP to *becoming* a GP. During this process, a range of influences, which changed over time, contributed.

In the first phase of training, residents perceived that they were absorbed in mastering the *practical* aspects of general practice, ranging from “making your own diagnoses, doing your own visits” to “doing independent surgeries” (F2). During this stage, residents were primarily focused on the biomedical and technical aspects of clinical experience and they felt that they had to “gather medical knowledge and skills” (F4, F7).

The entire first phase of training, was more about the content, about medical matters ... knowledge and skills. And as a first-year resident you don't have too much responsibility either. (F1)

However, when residents had gained enough confidence in their practical medical skills, they felt they gained space to give attention to what they saw as a core value of GP medicine. By being able to view patients holistically, rather than as people with diseases, residents felt “they had become more of a real GP” (F2).

I noticed that in my third year I looked further ... Now, I sometimes don't even start [in consultations] with a question about the complaint ... We actually first have a chat for a few minutes before we discuss that. And I realise I like that. (F5)

The role of the supervisor, as perceived by the residents, also changed. Residents frequently described a process from observing and imitating their supervisor (especially when practical aspects had to be mastered) and reflecting with the supervisor, to gradually finding their own way to practise.

That has been my style in the first year; a lot of copying. And now I think, well you do it this way. I don't think that is useful at all. I like to do it my way. (F4)

In the final year, residents experienced their relationship with their supervisors as being more ‘equal’ and different subjects were touched upon during learning conversations.

You also have different learning conversations with your supervisor ... In the first year, you are more focused on the practical, theoretical aspects, and in the third year you are now also sparring with each other more, about what kind of GP you want to become. (F3)

During the process of moving from ‘doing to becoming’, residents also experienced a change in how they were viewed by both GP assistants and patients. Increasingly they were seen as a GP, which appeared to strengthen their professional identity.

One day another GP came to visit [this patient], so he [the patient] said: ‘Where is my own GP?’. And he meant me, while I was actually still in training. This was an important moment for me as I realised that now I'm seen by patients as a GP. (F1)

### Negotiating perceived norms

In all focus groups, the multiple personal and professional roles residents have and how they expected to balance personal roles with their role as a GP appeared important aspects of their identity development. Residents across all focus groups agreed on GP values about “best possible care,” including “continuity of care” (F1), “commitment” (M2) and “being available for patients” (M6), but differed with their supervisors about how to operationalise these values.

Residents said they did not see their supervisors as role models in operationalising these values in a healthy way. Residents perceived that their supervisors expected that these values could only be reached by “running your own GP practice” (F1) and always being accessible to patients, which for residents would conflict with the fulfilment of their other roles. Hence, these perceived norms caused internal negotiations about how to balance their professional roles with their personal roles. However, residents perceived no room to discuss these challenges with their supervisors.

It's a generational problem too. The older generation thinks: responsibility is continuity. Responsibility for them is seven days a week, 24 hours a day ... They cannot teach us very well how to take care of patients as a team, because they mostly worked on their own. They have been limitless; always working in the evenings; doing everything by themselves, administration in the wee hours; giving their cell phone numbers to many of their patients. We are going to do that differently because we have a lot of plates spinning. We have multiple roles ... We have to figure out how. It will be different, but it won't necessarily be worse. (F1)

In all focus groups, residents talked about the multiple personal and professional roles they have and how they expected to balance these roles with being a GP. For most residents, “freedom to shape your

own way of working” (M2) as a GP, which creates the possibility of a “healthy work-life balance” (F1, F3), was an important “reason to aspire to a job outside the hospital” (M8). Residents also said they hoped to combine their future role as a GP with other important roles (eg, parent and partner).

Differing perspectives on the execution of GP practice arose particularly in the last year of residency, when residents tried to work out “what kind of doctor [they] wanted to become and how to organise [their] work as a GP” (M6). Residents expressed a profound desire to discuss the implementation of a sustainable, healthy GP practice with their supervisors. They wished for their supervisors not to impose their norms but rather to take a coaching role here as well.

## DISCUSSION

In this study we sought to gain insights into both the process of PIF during GP residency as well as which factors GP residents perceive as influential to their PIF. Study findings indicated that identity formation occurs primarily in the workplace, as residents move from doing to becoming and negotiate perceived norms. A tapestry of interrelated influencing factors, which changed over time, were felt to exert their influence predominantly in the workplace. In the following sections, we will discuss these themes and how our findings add to the existing PIF literature.

### It all happens in the workplace

Our study highlights the GP training practice as the place where the PIF of GP residents was mostly formed, with clinical experience, clinical supervisors and self-assessment as the most influential factors.

*Clinical experiences* gained during progressively independent practice were perceived by residents as the cornerstones of their PIF. This is in line with earlier studies on PIF in UGME,<sup>21 43</sup> which revealed the importance of experience gained from direct encounters with patients; it also echoes what is known about how residents learn.<sup>44–46</sup> Our findings about residents’ learning *on the job* and *from the job*, and their move to full participation, provide empirical evidence for what has been theorised on PIF previously.<sup>9 11 12 36</sup> It supports the assertion that PIF is most effectively influenced through ‘situations, not subjects’, that is, that residents’ professional identity is more likely to be influenced by doing the work than by being taught about it.<sup>26</sup> Moreover, it shows the overlap between PIF and learning in general and embraces the concept that PIF can be better understood as ‘becoming’ as opposed to ‘acquisition’ and ‘participation’.<sup>47</sup>

*Clinical supervisors* appeared to have essential roles in residents’ PIF, changing over time from role modelling to coaching. Residents mentioned clinical supervisors’ critical contribution to creating a safe environment in which residents could feel free to explore their (future)

professional identity, which created the need for ‘chemistry’ between residents and supervisors. This echoes the importance of the supervisory relationship as the most important factor in the effectiveness of supervision.<sup>25 48 49</sup> The specific GP setting, with few supervisors—often only one—may foster a relationship that facilitates PIF,<sup>50</sup> although when ‘chemistry’ is not felt it also might endanger PIF.

Our study also indicated that in addition to supervisors and clinical experiences, residents’ *self-assessment* is an important influence in PIF. This kind of self-assessment is closely related to what Cruess *et al*<sup>11</sup> called ‘conscious reflection’ in their model. Residents’ first focus is on *doing* the work of a GP well: they checked their diagnoses and therapy, whether their patients were satisfied and whether they were on course regarding time management. This echoes the process of self-entrustment as described by Sagasser *et al*.<sup>51</sup> Then, when residents have gained enough self-confidence in ‘doing’, their self-assessment focuses on *becoming* a GP: coping with uncertainty and comparing workplace-based experiences with peers. For the latter, they used the day-release programme, in particular the parts where they engaged in collaborative reflection and compared their own experiences with their peers’ stories and experiences, as described previously in the literature.<sup>52–54</sup>

### From doing to becoming

To conceptualise PIF as a movement from doing to becoming has been theorised on previously.<sup>2</sup> This study, however, is the first to provide empirical evidence on this change in PIF during residency. Our study builds on the literature about PIF by Pratt *et al*,<sup>13</sup> especially where they describe the process of ‘identity enriching’, whereby the basic tenets of a professional identity remain the same, but the identity becomes deeper and more nuanced. Our finding that when residents felt competent about their practical medical skills they could focus more on holistic care for patients entrusted to them can be seen as an example of this ‘identity enriching’.

Clinical supervisors also appeared to have a pivotal role in the movement from doing to becoming. Residents attributed different roles to their clinical supervisors, which changed over time. In the first period of training, clinical supervisors seemed to function primarily as role models for the practical aspects of medicine. When residents gained enough self-confidence in *doing* the work of a GP, they seemed to value their supervisors as role models in *being* a GP and providing holistic care. In the final period of training, however, they needed their supervisors as coaches with whom they could discuss their perspectives on how to execute GP practice and what kind of GP they wanted to become. Thus, during the years of training, there seemed to be a reciprocal change in the supervisory relationship: that is, the supervisor needed to change roles in response to the changing needs of the resident. This is in line with recent research.<sup>3 14 25 48</sup> For



example, Brown *et al* found that residents and supervisors adopted reciprocal identities during a 12-week GP intern placement. Our study adds that this reciprocal identity change not only concerns the practical aspects of medicine but also PIF.

### Negotiating perceived norms

According to the residents in our study, supervisors did not always seem to make this change. The latter became particularly evident near the end of residency, when residents felt a need to discuss their perspective on the execution of GP practice. Although residents mentioned that observing their supervisors on the job contributed to exploring what type of GP they wanted to become, they also needed their clinical supervisors as coaches to reflect on this. However, instead of that, they oftentimes felt that their supervisors imposed their own norms on them. Imposing norms seems to contrast the earlier described need for ‘chemistry’ between residents and supervisors as an important factor in guiding PIF.<sup>25 48 49</sup> Here lies a great challenge for supervisors, one that has recently been elaborated by Sawatsky *et al*,<sup>3</sup> who detailed the tension between competency-based medical education and PIF. Guiding residents’ PIF seems to require different supervisor competencies.<sup>3 4 55</sup>

### Strengths and limitations

For this study, we used the factors identified by Cruess *et al*<sup>11</sup> as sensitising concepts for both the interview guide and the deductive part of the analysis. This added rigour to our study, while our exploratory approach left open the possibility of finding complementary factors. Moreover, we were able to include a relatively large and diverse group of final-year residents. This, taken together with the interdisciplinary nature of our research team, made it possible to discern different perceptions on PIF.

There are, however, some limitations to this study. First, we included third-year trainees. Therefore, their perceptions about the first 2 years may have been restricted due to recall bias. Moreover, residents seldom spoke about their second year of training outside the GP training practice without prompting. What this means in the light of PIF is unclear and would merit further study. Third, because this study was limited to the GP context, transferability to other residency contexts may be limited. Fourth, being interviewed by a colleague (PB) could have negatively affected data collection; the participants might have provided ‘socially desirable’ answers. However, the interviewer kept a research journal in which he reflected on his role in each interview and discussed this in the research group.

### Implications for future research and practice

To allow for a more purposeful approach to PIF in residency, a richer picture of PIF in residency is needed.

Future exploratory studies should, therefore, focus on PIF in other residency contexts and examine other stakeholders’ perspectives, including clinical supervisors, educators outside the clinical workplace and patients. Because PIF is a long-term process, further research is also needed to examine PIF in the context of GP experiences during undergraduate training.

Our results begin to help make explicit what PIF in GP residency comprises. Now that some of the factors in GP residency PIF are better known, translating this knowledge into ways to actively support residents’ PIF would be worthwhile.

First, supervisors should acknowledge the very important role they play in PIF by building on a safe, reciprocal and changing supervisory relationship. As residents’ PIF is a movement from doing to becoming, guiding residents’ PIF requires different supervisor competencies across the different PIF stages.<sup>3 4 55</sup> Especially in the last period of residents’ training, supervisors should devote themselves to their role as a coach and give residents room to negotiate perceived norms around providing care, as advocated earlier.<sup>3 4</sup> Faculty development is also needed to make supervisors aware of their different roles across the different PIF stages and enhance their competence in these roles.<sup>12</sup> Second, the demonstrated importance of peers during the day-release programme could promote an even stronger emphasis on collaborative reflection during a day-release programme.<sup>53 54</sup> Third, our finding that residents’ professional identity is more likely to be influenced by doing the work than by being taught might open a debate on time distribution between days in practice and a day-release programme.

### CONCLUSION

This study is the first to explore both the process of PIF during the whole residency period as well as concurrent socialising factors and their interplay. Themes found to be important in the process of PIF during GP residency revolve around the workplace as the most important place for PIF, PIF as a movement from doing to becoming, and perceived norms about the execution of GP practice, which residents wish to discuss with their supervisors. A tapestry of interrelated influencing factors—most importantly, clinical experience, clinical supervisors and self-assessment—changed over time and were felt to exert their influence predominantly in the workplace. Our findings have implications for all stakeholders in the PIF of residents—supervisors and other educators as well as residents themselves.

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the analysis of the data and assisted in the writing of the manuscript. MEN and YS assisted in the analysis of the data and assisted in the writing process. AK and WNVN codedigned the study, performed the analysis of the data and assisted in the writing process. All authors read and approved the final version of the manuscript.

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