

# PURsuit of Endocrinology (PURE): A National Survey among First-Year Endocrinology Residents Across India

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## Abstract

**Background:** Endocrinology has been a popular choice of super-specialisation in India in recent years. The PURsuit of Endocrinology (PURE) survey aims to determine the factors that facilitated the selection of endocrinology as the area of super-specialisation among first-year residents across India. **Methods:** We conducted an electronic questionnaire-based survey among first-year residents across India. The questionnaire evaluated the respondents' demographics, feeder speciality, challenges during preparation, factors influencing endocrinology as a career preference, unappealing aspects of the subject and future career plans. **Results:** A total of 81 (43 males and 38 females) responses were recorded. The mean age was  $31.3 \pm 3.3$  years, with 63% married. Internal medicine was the feeder speciality in 92.5% of cases. Work-life balance was the critical consideration for pursuing endocrinology in 91.4%, followed by professional satisfaction (64.2%) and the scope of having a solo practice (43.2%). Interestingly, there was less emphasis on monetary satisfaction (12.3%). Almost half of the respondents intended to practice in a government academic institution (46.9%) or in an independent set-up (45.7%). **Conclusions:** The PURE survey suggests that work-life balance and professional satisfaction are the key driving factors behind the choice of endocrinology. An increasing interest among the residents to join as faculty in academic institutions, apart from having self-owned private clinics, is a welcome finding.

**Keywords:** Career, endocrinology, India, profession, residency, work-life balance

## INTRODUCTION

In a long-winding medical career, choosing the domain of super-specialisation is a transformative step that determines how the rest of one's professional and personal life will shape up. Endocrinology has emerged as a popular choice for super-specialisation globally, with some regional differences. Recent studies from the United Kingdom and the United States of America (USA) explored reasons and solutions for the downward trend in the number of students choosing endocrinology as a career option.<sup>[1,2]</sup> In contrast, endocrinology has been a sought-after discipline in India for the last few years. When asked about their subject of choice, endocrinology ranked high in a Permanent Account Number (PAN)-India survey of internal medicine residents.<sup>[3]</sup> There are currently 95 seats for the Doctorate of Medicine (DM) and 24 for the Doctorate

of National Board (DrNB) course in endocrinology in India. Recent trends suggest that endocrinology seats are opted for, by examinees who secure high ranks, and none remain vacant.<sup>[4-6]</sup>

The factors that influence the choice of specialisation in India have been studied as early as the 1980s.<sup>[7]</sup> The quality of life (QoL) for an endocrinologist was perceived as 'good' by students training in the speciality and practicing doctors.<sup>[8]</sup> Personality traits may also play a role in the choice of the branch.<sup>[9]</sup>

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The PURsult of Endocrinology (PURE) survey aims to determine the factors that resulted in endocrinology emerging as a coveted field of super-specialisation in India.

## METHODS

### Participants and data collection

The PURE survey is a cross-sectional study to assess the reasons behind selecting endocrinology as the area of super-specialisation. The study cohort comprised first-year endocrinology residents from India who qualified in the 2021–2022 entrance examination. A total of 104 residents were invited to participate in the survey. We excluded second- and third-year students, as residency experience might bias their perceptions. The electronic questionnaire was administered during the Health Research Methodology Workshop conducted by the Endocrine Society of India (ESI) from 11 to 13 November 2022 in Delhi. Most first-year endocrine residents from India attended the workshop. Residents who were not part of the workshop were contacted by phone and email. Participation was voluntary after obtaining informed consent.

### The survey

We designed a survey containing 16 questions regarding the factors that may impact the residents' decision to pursue endocrinology as their career. A team of two endocrinologists and two psychiatrists validated the survey.

The questionnaire was divided into five sections. Demographics, including age, gender, marital status and family background (doctor family vs. first-generation doctor), were the focus of the first section. The second section enquired about feeder speciality and challenges during preparation for entrance examinations. Factors influencing endocrinology as a career preference were assessed in the third section. The fourth section studied which features of endocrinology were unappealing. The fifth and final section asked about future career plans. Answers to multiple options were possible in the survey (Supplement 1).

### Statistical analysis

Continuous data are presented as the mean and standard deviation (SD), while categorical variables are presented as numbers (percentages). To compare parameters between the two groups, we did the Chi-square test for categorical variables and the independent-samples t-test for quantitative variables or equivalent nonparametric tests as appropriate. A *P* value of < 0.05 was considered statistically significant. All statistical analysis was performed using IBM Statistical Package for the Social Sciences (SPSS) Statistics 20 Windows (SPSS Inc., Chicago, USA).

## RESULTS

Of the 104 first-year residents contacted, 81 (43 males and 38 females) responded to the PURE survey (77.8% response rate). The mean age was  $31.3 \pm 3.3$  years, 63% were married

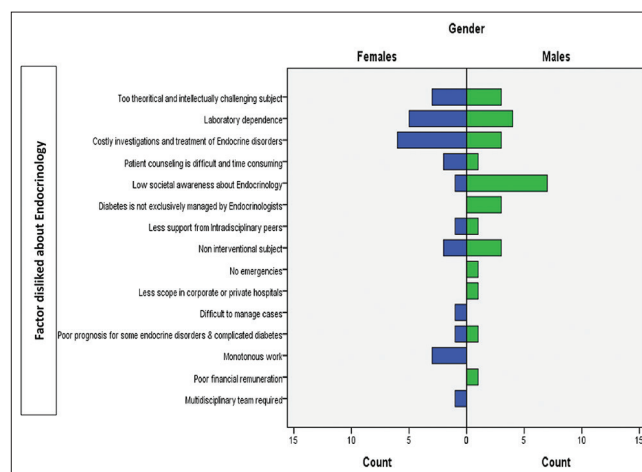
and 70.4% were first-generation doctors in the family. The time spent preparing for the entrance was one year or less for 56.7% of students.

Internal medicine was the feeder speciality in 92.5% and paediatrics in only 7.5%. Most (90.1%) preferred adults as their patient population, while 55.6% and 37% were comfortable with adolescents and children, respectively. A sizeable proportion (72.8%) had no experience in endocrinology, and only 53.8% had undergone endocrinology rotation during postgraduation. Perceived challenges during preparation for entrance examinations were fewer endocrinology seats compared with other specialities (75.3%), inadequate exposure to endocrinology (53.1%), lack of guidance from seniors (42%) and dearth of multiple-choice questions (MCQ) books (32.1%). Coaching classes (66.7%) followed by endocrinology textbooks (56.8%) were the primary source of study material for preparation. Only 25.9% had referred to MCQ books.

An overwhelming majority of residents (91.4%) named work–life balance as the most critical consideration in their decision to pursue endocrinology, followed by professional satisfaction (64.2%) and the scope of having solo practice (43.2%). Financial aspects were not a common consideration (12.3%) while opting for endocrinology. Interesting endocrinology cases during medical school (44.4%) and endocrinology peers (28.4%) were other factors that had an influence.

The three most popular sub-specialities in endocrinology were adrenals (55.6%), diabetes mellitus (50.6%) and bone and mineral metabolism (46.9%). Almost half of the residents indicated that they intended to practice in a government academic institution (46.9), and the other half wanted to practice independently (45.7%).

A narrative response about what the residents considered unattractive about endocrinology was also obtained. We received thirteen different answers to this question [Figure 1].



**Figure 1:** Factors disliked about endocrinology—comparison among male and female residents

Around 32.1% mentioned that there is no factor that they dislike about the subject. The most commonly cited unappealing factors were dependence on the laboratory (11.1%) and the high cost of investigations and treatment (11.1%), followed by poor societal perception about the scope of endocrinology (9.9%).

### Subgroup analysis by gender

There were no differences between male and female respondents regarding demographic variables, reasons behind opting for endocrinology or unappealing aspects of the subject [Table 1 and Figure 1]. However, regarding future

options, male respondents fancied working in a corporate hospital more than female respondents ( $n = 17, 39.5\%$  vs.  $n = 7, 18.4\%$ ,  $P = 0.02$ ).

Poor financial remuneration ( $n = 1$ ), lack of emergencies ( $n = 1$ ), limited scope in corporate hospitals ( $n = 1$ ) and lack of awareness among masses about diabetes being an endocrine condition ( $n = 3$ ) were cited as unattractive factors by male residents. The unappealing aspects considered by female residents were the need for a multidisciplinary team ( $n = 3$ ), work monotony ( $n = 1$ ) and difficulties in solving complex endocrine cases ( $n = 1$ ) [Figure 1].

**Table 1: Comparison of male and female residents**

Parameter	Males (n=43)	Females (n=38)	Total
Mean age (SD)	31.9 (3.78)	30.7 (2.69)	
Married	28 (65.1%)	23 (60.5%)	51 (63%)
Unmarried	15 (34.9%)	15 (39.5%)	30 (37%)
Separated/divorced	0	0	0
Feeder speciality			
MD (Medicine)	35 (81.4%)	33 (86.8%)	68 (84%)
DNB (Medicine)	6 (14%)	1 (2.6%)	7 (8.6%)
MD (Paediatrics)	2 (4.7%)	4 (10.5%)	6 (7.4%)
Type of college from which feeder speciality was done			
MD/DNB in govt. hospital with endocrinology rotation	13 (30.2%)	16 (42.1%)	29 (35.8%)
MD/DNB in govt. hospital without endocrinology rotation	14 (32.6%)	13 (34.2%)	27 (33.3%)
MD/DNB in private hospital with endocrinology rotation	8 (18.6%)	6 (15.8%)	14 (17.3%)
MD/DNB in private hospital without endocrinology rotation	8 (18.6%)	3 (7.9%)	11 (13.6%)
Years post-PG spent for preparation			
<1 yrs	20 (46.5%)	16 (42.1%)	36 (44.4%)
1–2 yrs	9 (20.9%)	14 (36.8%)	23 (28.4%)
2–3 yrs	6 (14%)	4 (10.5%)	10 (12.3%)
3–4 yrs	4 (9.3%)	3 (7.9%)	7 (8.6%)
4–5 yrs	3 (7%)	0	3 (3.7%)
>5 yrs	1 (2.3%)	1 (2.6%)	2 (2.5%)
Resources used for preparation			
Endocrinology textbooks	24 (55.8%)	21 (55.3%)	45 (55.6%)
Coaching classes	26 (60.5%)	27 (71.1%)	53 (65.4%)
Medicine/paediatrics textbooks	16 (37.2%)	10 (26.3%)	26 (32.1%)
MCQ books in endocrinology	9 (20.9%)	12 (31.6%)	21 (25.9%)
Reason (s) behind preference of subject			
Professional satisfaction	26 (60.5%)	27 (71.1%)	53 (65.4%)
Academically challenging subject	13 (30.2%)	17 (44.7%)	30 (37%)
Good work–life balance	40 (93%)	33 (86.8%)	73 (90.1%)
Financial security	6 (14%)	4 (10.5%)	10 (12.3%)
Ability to develop solo private practice	22 (51.2%)	13 (34.2%)	35 (43.2%)
Multiple career options	8 (18.6%)	6 (15.8%)	14 (17.3%)
Opportunities for research	7 (16.3%)	6 (15.8%)	13 (16%)
Inspired by a mentor	8 (18.6%)	11 (28.9%)	19 (23.5%)
No further sub-specialisation required	1 (2.3%)	2 (5.3%)	3 (3.7%)
Family pressure	1 (2.3%)	1 (2.6%)	2 (2.5%)
Future career plans post-DM			
Government academic institution	20 (46.5%)	18 (47.4%)	38 (46.9%)
Solo private practice	20 (46.5%)	17 (44.7%)	37 (45.7%)
Government non-academic hospital	4 (9.3%)	1 (2.6%)	5 (6.4%)
Corporate hospital*	17 (39.5%)	7 (18.4%)	24 (29.6%)
Abroad	8 (18.6%)	7 (18.4%)	15 (18.5%)

\*Denotes significant differences between male and female residents,  $P < 0.05$ . Categorical variables are expressed as  $n$  (%). Yrs=years. MD=Doctor of Medicine, DNB=Diplomate of National Board

### Subgroup analysis by marital status

Professional satisfaction and dealing with an academically challenging subject were the significant determining factors for selecting endocrinology among unmarried residents compared with married ones ( $n = 24$ , 80% vs.  $n = 29$ , 56.9% for professional satisfaction and  $n = 18$ , 60% and  $n = 12$ , 24.5% for academic challenge,  $P$  value both  $< 0.03$ ).

### Subgroup analysis of preferred patient load according to feeder speciality

As expected, a higher proportion of respondents trained in paediatrics during postgraduation preferred to treat children in the future than those trained in internal medicine ( $n = 6$ , 100% vs.  $n = 24$ , 35.3% for Doctor of Medicine (MD) Paediatrics vs. MD,  $P = 0.047$ ). Similarly, students trained in internal medicine had more inclination for adults ( $n = 63$ , 92.6% and  $n = 7$ , 100% for MD and Diplomate of National Board (DNB) Medicine vs.  $n = 2$ , 33.3% for MD Paediatrics,  $P < 0.001$ ). There were no inter-group differences in preference for adolescents, elderly or obstetric patients. Interestingly, four residents with an MD degree (5.9%) wanted to treat children exclusively. Almost two-thirds (63.2%) of residents with MD and all with DNB Medicine wished to attend to adults only.

### Subgroup analysis based on exposure to endocrinology during postgraduation

We found that a higher proportion of those who did their postgraduation in government or private colleges without endocrinology rotation cited lack of exposure to endocrinology cases during postgraduation as the most common challenge faced during preparation (77.8% and 54.5% of those from government and private colleges without endocrinology rotation vs. 44.8% and 21.4% of those from government and private colleges with endocrinology rotation,  $P = 0.003$ ).

Some of the postgraduates ( $n = 4$ ) without endocrinology rotation considered the complexities around difficult cases in endocrinology as a constraint. Those with prior exposure to endocrinology ( $n = 3$ ) felt that challenges and time taken to counsel endocrine patients were significant limitations. The cost of therapy and dependence on investigations were unappealing aspects of the discipline according to both groups.

## DISCUSSION

The PURE survey was undertaken among first-year residents across all the teaching institutions in India offering super-speciality degrees in endocrinology. The mean age at entry to the super-speciality course was  $31.3 \pm 3.3$  years, and most participants had spent one year or less preparing for the entrance examination. With the inception of the National Entrance Cum Eligibility Test for Super-speciality (NEET-SS) and the weightage given to medicine questions (40% medicine and 60% endocrinology questions in the years 2021–2022), students who had freshly completed postgraduation seemed to have an advantage. The mean age of students is less than that observed in the Perceptions about Training during

Endocrinology Residency Programs in India over the Years: A Cross-sectional Study (PEER India Study), a similar survey published in 2017.<sup>[8]</sup> We expect to see even younger students pursuing super-speciality in the coming years as NEET-SS from 2022 to 2023 is entirely based on feeder speciality (e.g. medicine questions only for endocrinology and other medical super-speciality subjects).

The proportion of male and female respondents was almost equal in our study, while in the PEER India study, 24.11% of the respondents were female residents or practicing endocrinologists.<sup>[8]</sup> In a study from the USA, 36% of endocrinologists were women.<sup>[10]</sup> There has been a substantial increase in the proportion of women taking internal medicine over the past decade in India. Obstetrics and Gynaecology (O&G), followed by pre- and paraclinical subjects, have been usually preferred by female residents.<sup>[11]</sup> While the choice of O&G is driven by the fact that women feel more comfortable with a female practitioner for gynaecological problems, the preference for the latter group of subjects (pre- and paraclinical) is due to a better work–life balance. However, these might be fraught with the issues of lesser financial remuneration and limited clinical exposure. Endocrinology could offer the perfect balance of sufficient monetary incentive, work–family time distribution, fixed work timing with few emergencies, ample opportunities for academic and research pursuit and better QoL.<sup>[8]</sup> The majority of the respondents (63%) were married. Since the data on marital status at the entry of super-speciality residents from other streams are sparse, it is difficult to conclude whether marital status is a determining factor behind the choice of subject.

A vast majority (92.5%) were from the feeder speciality of medicine. In India, the endocrinology super-specialisation course encompasses training in both adult and paediatric endocrine and metabolic diseases. A subgroup analysis by feeder speciality revealed that those with postgraduation degrees in paediatrics and medicine were likely to prefer paediatric and adult patient load, respectively, though there was an overlap between the groups. In fact, four residents, despite having trained in adult medicine, wanted to exclusively treat paediatric patients in the future. Our results indicate that a few endocrinologists from an adult medicine background are interested in managing paediatric cases. Children and adolescents account for a substantial volume of patients attending endocrinology clinics. Cases in paediatric endocrinology are academically fascinating and challenging, and the treatment results can be satisfying. There are only three seats in DM Paediatric Endocrinology in India today, which is grossly out of proportion to the necessity. Nevertheless, the endocrinology super-speciality curriculum devotes substantial attention to paediatric endocrinology, and most endocrinologists are trained to cater to both adult and paediatric cases.<sup>[12,13]</sup>

Almost 75% of the respondents had not worked in an endocrinology set-up before admission, though interesting



endocrinology cases were a stimulus for many to take up endocrinology. Many medical institutions in India have limited exposure to core endocrinology cases for postgraduate students and infrequent access to endocrinology interest groups or conferences. Though limited in number, the few exciting cases the residents came across during postgraduate training could have sparked their interest in the subject. In line with our results, a recent study from the USA reported endocrinology experience during internal medicine residency as the most influential factor (44.9%) driving the choice of discipline.<sup>[2]</sup> Lack of exposure to endocrinology cases was a common challenge faced during preparation for the entrance examination, particularly for those with no rotation in endocrinology during postgraduation. Also, very few reported being guided by mentors or inspired by role models in endocrinology. This seems to be the scenario the world over. Endocrinology fellows in the USA stated that their exposure to endocrinology in medical school was insufficient for them to fully appreciate the role of an endocrinologist.<sup>[2]</sup> This signifies the need for having devoted endocrinology departments with distinguished faculty in institutions offering postgraduate degrees in medicine or paediatrics.

Coaching classes and endocrinology textbooks were the prime support during preparation. Only 25.9% got help from MCQ books. Currently, there are very few MCQ books focused on endocrinology written by experts.<sup>[14]</sup> The NEET-SS has shifted to a medicine-based question pattern from 2022 to 2023, and the primary focus of the students during preparation will move to medicine in the coming years.

The three most common reasons behind taking up endocrinology were work–life balance, professional satisfaction and the scope for solo practice. In the PEER India study, endocrinology was ranked higher for providing better QoL than other branches by both residents and faculty, despite being lower on the list with regard to financial satisfaction.<sup>[8]</sup> Given the growing rates of mental health problems, depression and suicide among residents, work–life balance should indeed be a priority. The holistic definition of health encompasses a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.<sup>[15]</sup> It is reassuring to see young physicians choosing endocrinology in pursuit of health. It appears they have been able to fully comprehend the definition of health, not only for their patients but for themselves as well.

Endocrinology gives the freedom to set up private clinics in urban, semi-urban or rural areas with equal ease and the potential to beget a sizeable number of patients. Moreover, the growing epidemic of diabetes in addition to the rising awareness about endocrinological disorders is likely to make endocrinology a crucial aspect of healthcare in the coming years.

It is interesting to observe that while the intellectual challenges in endocrinology were stimulating for those who underwent rotational training, this was also a constraint for those who did not have prior exposure. This emphasises the need for setting up endocrinology departments in postgraduate teaching

institutes. Laboratory dependence and cost of therapy were perceived as unattractive for residents from government colleges as the patient population they had catered to was most likely to have financial limitations.

The most favoured section in endocrinology was adrenals, followed by diabetes mellitus and bone and mineral metabolism. In the PEER India study, adrenals and paediatric endocrinology were favourites among faculty, while the residents found paediatric endocrinology most interesting.<sup>[8]</sup> The PEER India study was conducted six years back and the change in the preference could reflect more number of residents from a background in medicine rather than paediatrics, given the current NEET-SS pattern. Also, the diagnosis and management of adrenal disorders are rewarding. Advancements in the imaging and diagnostic protocols for adrenal disorders and availability of newer medicines have garnered attention in recent years.<sup>[16]</sup>

Though the majority of the respondents opted for private practice (45.7% for self-owned clinics and 29.6% for corporate hospitals), we observed an increasing interest (46.9%) to join as teaching faculty in a government medical college. This is in contrast to the PEER India study, where only 17.6% of residents wanted to join a teaching institution.<sup>[8]</sup> The rising interest in academic posts is an encouraging finding and would aid in popularising the subject among the future generation of doctors and would promote meaningful research. Another noteworthy observation was that compared with female residents, a greater number of male residents preferred joining a corporate hospital. The reasons remain to be explored. Going abroad has not been quite a preferred career option in our study or the PEER India study.<sup>[8]</sup> Endocrinology is not a sought-after branch outside India, but it stands in high demand in our country.

To the best of our knowledge, PURE is the first study in the country to comprehensively assess the factors that might influence the choice of endocrinology among residents. We included first-year residents only to look at factors facilitating the choice and avoid bias in responses. The inclusion of second- and third-year residents could have led to a larger sample size, but residency experience has the potential to alter the responses. A digitalised questionnaire with automated data recording minimised the chances of error.

Our study has the major limitation of lacking a control group. Second, the response of all the first-year residents could not be recorded. Third, there could have been a better response rate but also a bias in responses since the study was conducted during a health research methodology workshop by ESI. Finally, a follow-up questionnaire study on the same cohort of residents after the completion of their residency could validate the responses.

## CONCLUSION

Endocrinology is one of the most sought-after disciplines for super-specialisation in India. There might be a need for

greater exposure to endocrine cases during postgraduate training to trigger interest in the speciality. An increasing interest among the residents to join as faculty in academic institutions is a welcome finding. Work–life balance and professional satisfaction are the driving factors behind the choice of this subject. It is reassuring to see young physicians choosing endocrinology in pursuit of comprehensive health not only for their patients but also for themselves. Follow-up studies may help explore whether the occurrence of compassion fatigue and burnout is less among endocrinologists as compared to doctors in other specialities. It will also be interesting to see whether young endocrinologists are able to practice holistic medicine in a more effective and efficient manner than their non-endocrine colleagues.

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### Conflicts of interest

There are no conflicts of interest.

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## SUPPLEMENTARY MATERIAL

### QUESTIONNAIRE

\*Multiple responses possible

I consent to this survey

- Yes
- No

1. Age
2. Gender
  - Male
  - Female
3. Feeder speciality
  - MD Medicine
  - MD Paediatrics
  - DNB Medicine
  - DNB Paediatrics
4. Feeder speciality from
  - MD/DNB in government hospital with endocrinology rotation
  - MD/DNB in government hospital without endocrinology rotation
  - MD/DNB in private hospital with endocrinology rotation
  - MD/DNB in private hospital without endocrinology rotation
5. Family background
  - Doctor family
  - First-generation doctor
6. Marital status
  - Married
  - Unmarried
  - Divorced
  - Separated
  - Other
7. Have you worked in an endocrinology set-up before?
  - Yes
  - No
8. How many years post-MD/DNB training did you spend on DM entrance preparation
  - 0
  - Less than 1 year
  - 1 year
  - 2 years
  - 3 years
  - 4 years
  - 5 years
  - > 5 years
9. What was the major source of study material during DM/DNB entrance preparation\*
  - Coaching classes
  - Endocrinology textbooks
  - Medicine/paediatrics textbooks
  - Multiple-choice question books
  - Other
10. Reasons for preference of endocrinology as a speciality\*
  - Professional satisfaction

- Academic challenge
- Work–life balance
- Monetary safety net
- Ability to practice solo
- Career opportunities
- Family pressure/spouse’s speciality
- Inspired by teacher/mentor
- End speciality—no further sub-specialisation required
- Research prospects
- Other

If your answer to question 10 is ‘other’, please elaborate the reason for preference of endocrinology as a speciality

- Who had the most influence on your decision to take up endocrinology\*
  - Family
  - Role model
  - Distinguished mentor
  - Endocrinology patients during MD training
  - Peers in endocrinology
- One aspect of the speciality you consider unattractive
- Challenges in entrance preparation\*
  - Lack of peer support
  - Inaccessibility to endocrinology books
  - Lack of guidance from seniors in endocrinology
  - Lack of exposure to endocrinology cases during MD training
  - Fewer DM/DNB seats in endocrinology compared to other specialities
  - Lack of MCQ books in endocrinology
- Favourite area in endocrinology\*
  - Diabetes mellitus
  - Pituitary
  - Adrenals
  - Paediatric endocrinology
  - Reproductive endocrinology
  - Bone and mineral metabolism
  - Obesity
  - Other
- Preferred patient load\*
  - Children
  - Adolescents
  - Adults
  - Obstetric
  - Elderly
- Future plans\*
  - Government practice
  - Government academic institution
  - Corporate hospital
  - Solo private practice
  - Abroad
  - Not sure