RESEARCH ARTICLE

# Patient's knowledge and perception of anaesthesia and anaesthesiologist: data from a tertiary centre in Pakistan

Khalid Maudood Siddiqui, Fahad Islam, Bushra Salim, Muhammad Ali Asghar

## Abstract

**Objective:** To assess patients' knowledge of anaesthesia and the role of anaesthesiologists.

**Method:** The cross-sectional study was conducted at the Aga Khan University Hospital, Karachi from October 2020 to April 2021 and comprised patients of either gender aged 18-60 years who were undergoing preoperative assessment. Data was collected through a structured questionnaire evaluating knowledge about anaesthesia and anaesthesiologists, focussing on perioperative roles and responsibilities. Data was analysed using RStudio version 4.1.2.

**Results:** Of the 150 patients with mean age 49.14±8.49 years, 82 (54.7%) were females and 70 (45.3%) were males. Overall, 100(66.7%) patients had good and 50(33.3%) had poor knowledge. Those with prior anaesthesia experience had significantly better knowledge ($p<0.001$). Individuals aged up to 40 years exhibited poorer knowledge compared to older participants ($p=0.033$). Higher knowledge levels were observed among those who recognised anaesthesiologists as specialists ($p=0.016$) and understood the importance of preoperative assessments ($p<0.001$). Awareness about the anaesthesiologists' role during continuous monitoring and postoperative care was also significantly associated with better knowledge ($p<0.001$).

**Conclusion:** A substantial lack of patient awareness about anaesthesia and the role of anaesthesiologists was found.

**Key Words:** Anaesthesia knowledge, Anaesthesiologist awareness, Patient education, Perioperative care, Preoperative assessment. (JPMA 76: 372; 2026) **DOI: https://doi.org/10.47391/JPMA.22631**

## Introduction

The role of the anaesthesiologist has extended beyond the constraints of traditional operating rooms (ORs). Their expertise is essential in pain management, critical care, and palliative care, in addition to administering anaesthesia for surgeries. Anaesthesiologists are also skilled in cardiopulmonary resuscitation, both basic and advanced life support and disaster management.[1] Anaesthesiologists play vital roles in critical care units, trauma centres and pain clinics, and serve as key members of resuscitation teams globally.[2] Despite significant advancements in the field, anaesthesia continues to suffer from a poor public image. Many clients, particularly in underdeveloped countries, are unaware that anaesthesiologists are medically qualified health professionals.[3]

Global surveys have shown that two out of three patients recognise anaesthesiologists as competent healthcare professionals who perform their duties independently. However, the surveys also indicate that patients living in developing countries have less awareness compared to those who live in developed nations, likely due to factors such as lower education levels and limited access to information through media and the internet.[4,5]

The perception and status of anaesthesiologists, both within the medical community and among the public, have long been problematic. Despite the rapid growth and significant technological advancements in anaesthesiology over the past 30 years, the media often neglects the crucial role of the anaesthetic team in achieving successful surgical outcomes. Public awareness programmes, including the celebration of World Anaesthesia Day on October 16 in many developed countries, aim at educating people about the role and training of anaesthesiologists. While awareness is increasing in Pakistan, the general population still has limited knowledge about the field. The current study was planned to assess patients' knowledge about anaesthesia and the role of the anaesthesiologists during perioperative care.

## Subjects and Methods

The cross-sectional study was conducted at Aga Khan University Hospital, Karachi from October 2020 to April 2021 and comprised patients visiting the hospital for preoperative assessment before undergoing elective

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surgeries with either general or regional anaesthesia. The study followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines.[6] After approval from the institutional ethics review board, the sample size was calculated using "OpenEpi" calculator with 7% margin of error and 95% confidence level based on a previous study[7] according to which 22% of the patients were aware of anaesthesiologists' responsibility for blood transfusion. The minimum required sample size was 135 that was rounded up to 150. The sample was raised using non-probability consecutive sampling technique. Those included were patients of either gender aged 18-60 years. Patients were excluded if they had neurological or psychiatric disorders, such as dementia, schizophrenia, or other cognitive impairments, or if they declined consent. Verbal and written consent was taken from all the participants.

Data was collected through a structured questionnaire that assessed patients' knowledge of anaesthesia and anaesthesiologists' perioperative and extra-operative roles. The study questionnaire's face and content validity were established through expert review. A panel of subject matter experts in anaesthesiology independently evaluated questionnaire for clarity, and relevance. Feedback from the reviewers was incorporated to refine item wording, eliminate redundancies. The final version reflected consensus on appropriateness and comprehensiveness of the questionnaire. The questionnaire was administered by the primary investigator or co-investigator, who filled out responses directly during patient interactions. The primary outcome focussed on assessing patients' knowledge, with a computed knowledge score based on the percentage of correct answers relative to total responses. Scores <50% were categorised as 'Poor,' while scores >50% were considered 'Good.'

Data was analysed using RStudio version.4.1.2 Qualitative variables, such as gender, educational level, and perceptions, were expressed as frequencies and percentages, while mean ± standard deviation were calculated for quantitative variables. Stratification analysis was conducted to identify significant associations between knowledge levels and demographic factors. Chi-square or Fisher's exact tests were used, as appropriate, to examine associations between knowledge level and other studied variables. P≤0.05 was considered significant.

## Results

All the 150(100%) patients approached volunteered to participate. The mean age of the sample was 49.14±8.49 years. There were 82(54.7%) females, and 68(45.3%) were males. In terms of educational status, 5(3.3%) participants were illiterate, 7(4.7%) had completed primary school, 38(25.3%) had attended high school, 81(54.0%) were college graduates, and 19(12.7%) had completed postgraduate education. Regarding previous surgical experiences, 53(35.3%). Those with previous anaesthesia exposure had significantly better knowledge, with 104(69.3%) participants demonstrating good knowledge and 46(30.7%) demonstrating poor knowledge (p<0.001). Among those with good knowledge, 47(45.2%) were males compared to 21(45.7%) males with poor knowledge. Among females, 57(54.8%) had good knowledge, and 25(54.3%) had poor knowledge (p=0.900). Age also played a significant role, with participants aged up to 40 years having poorer knowledge compared to those aged >40 years (p=0.033) (Table 1).

**Table-1:** Demographic characteristics of the patients.

| Demographics | Good Knowledge (N=104) | Poor Knowledge (N=46) | Total (N=150) | P-value |
|---|---|---|---|---|
| **Age (Years)** | | | | 0.033 |
| ≤ 40 | 45 (43.3%) | 29 (63.0%) | 74 (49.3%) | |
| >40 | 59 (56.7%) | 17 (37.0%) | 76 (50.7%) | |
| Gender | | | | 0.900 |
| Female | 57 (54.8%) | 25 (54.3%) | 82 (54.7%) | |
| Male | 47 (45.2%) | 21 (45.7%) | 68 (45.3%) | |
| **Education** | | | | <0.001 |
| Graduation | 65 (62.5%) | 16 (34.8%) | 81 (54.0%) | |
| High school | 15 (14.4%) | 23 (50.0%) | 38 (25.3%) | |
| Illiterate | 5 (4.8%) | 0 (0%) | 5 (3.3%) | |
| Post-graduation | 19 (18.3%) | 0 (0%) | 19 (12.7%) | |
| Primary | 0 (0%) | 7 (15.2%) | 7 (4.7%) | |
| **Previous operations** | | | | <0.001 |
| No | 56 (53.8%) | 41 (89.1%) | 97 (64.7%) | |
| Yes | 48 (46.2%) | 5 (10.9%) | 53 (35.3%) | |
| **if yes, type of anaesthesia** | | | | 0.040 |
| General Anaesthesia | 46 (44.2%) | 3 (6.5%) | 49 (92.5%) | |
| Regional | 2 (1.9%) | 2 (4.3%) | 4 (7.5%) | |

In terms of anaesthesia providers, a significant difference was observed between the qualification of the anaesthetist and the knowledge level of the participants (p=0.016). Most participants with good knowledge were those who identified the anaesthetist as a specialist

**Table-2:** Knowledge about the role of anaesthesiologists.

| Knowledge about anaesthesia provider | Good Knowledge (N=104) | Poor Knowledge(N=46) | Total (N=150) | P-value |
|---|---|---|---|---|
| **The anaesthesiologist is a** | | | | 0.016 |
| General practitioner | 5 (4.8%) | 3 (6.5%) | 8 (5.3%) | |
| Nurse | 12 (11.5%) | 15 (32.6%) | 27 (18.0%) | |
| Specialist physician | 79 (76.0%) | 26 (56.5%) | 105 (70.0%) | |
| Technician | 8 (7.7%) | 2 (4.3%) | 10 (6.7%) | |

**Table-3:** Knowledge about the role of anaesthesiologists during perioperative care.

| Preoperative roles | Good Knowledge (N=104) | Poor Knowledge (N=46) | Total (N=150) | P-value |
|---|---|---|---|---|
| Preoperative assessment | | | | <0.001 |
| Yes | 104 (100%) | 39 (84.8%) | 143 (95.3%) | |
| No | 0 (0%) | 7 (15.2%) | 7 (4.7%) | |
| Asking for investigations and consultations | | | | 0.001 |
| No | 40 (38.5%) | 31 (67.4%) | 71 (47.3%) | |
| Yes | 64 (61.5%) | 15 (32.6%) | 79 (52.7%) | |
| Deciding on patient fitness to undergo surgery | | | | <0.001 |
| No | 33 (31.7%) | 31 (67.4%) | 64 (42.7%) | |
| Yes | 71 (68.3%) | 15 (32.6%) | 86 (57.3%) | |
| Determining fasting duration | | | | 0.836 |
| No | 79 (76.0%) | 36 (78.3%) | 115 (76.7%) | |
| Yes | 25 (24.0%) | 10 (21.7%) | 35 (23.3%) | |
| Intraoperative roles | | | | |
| Giving patient the required hypnotic drugs | | | | |
| Yes | 104 (100%) | 46 (100%) | 150 (100%) | 1.000 |
| Giving patient the required analgesic drugs | | | | 0.178 |
| No | 6 (5.8%) | 0 (0%) | 6 (4.0%) | |
| Yes | 98 (94.2%) | 46 (100%) | 144 (96.0%) | |
| Administering any medication that the patient may need in operating theatre | | | | 0.219 |
| No | 29 (27.9%) | 8 (17.4%) | 37 (24.7%) | |
| Yes | 75 (72.1%) | 38 (82.6%) | 113 (75.3%) | |
| Continuously monitoring the patient without leaving the operating room | | | | <0.001 |
| No | 53 (51.0%) | 37 (80.4%) | 90 (60.0%) | |
| Yes | 51 (49.0%) | 9 (19.6%) | 60 (40.0%) | |
| Looking after patients' needs of fluids | | | | 0.184 |
| No | 88 (84.6%) | 43 (93.5%) | 131 (87.3%) | |
| Yes | 16 (15.4%) | 3 (6.5%) | 19 (12.7%) | |
| Estimating blood loss and carrying out necessary blood transfusion | | | | 1.000 |
| Supervising patient in the recovery room | | | | 0.058 |
| No | 95 (91.3%) | 46 (100%) | 141 (94.0%) | |
| Yes | 9 (8.7%) | 0 (0%) | 9 (6.0%) | |
| Treating any complications in the recovery room | | | | 0.077 |
| No | 79 (76.0%) | 41 (89.1%) | 120 (80.0%) | |
| Yes | 25 (24.0%) | 5 (10.9%) | 30 (20.0%) | |

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| Preoperative roles | Good Knowledge (N=104) | Poor Knowledge (N=46) | Total (N=150) | P-value |
|---|---|---|---|---|
| Outside-operating room roles | | | | |
| Managing patients in the ICU | | | | <0.001 |
| No | 43 (41.3%) | 42 (91.3%) | 85 (56.7%) | |
| Yes | 61 (58.7%) | 4 (8.7%) | 65 (43.3%) | |
| Perform cardiopulmonary resuscitation | | | | 0.058 |
| No | 95 (91.3%) | 46 (100%) | 141 (94.0%) | |
| Yes | 9 (8.7%) | 0 (0%) | 9 (6.0%) | |
| Chronic and acute pain management | | | | <0.001 |
| No | 53 (51.0%) | 38 (82.6%) | 91 (60.7%) | |
| Yes | 51 (49.0%) | 8 (17.4%) | 59 (39.3%) | |

physician 79(76%), while the fewest were associated with identifying the anaesthetist as a general practitioner 5(4.8%). Additionally, a significant association was found between the perception of the most important role during surgery and knowledge levels (p=0.004). Participants who believed both the anaesthetist and surgeon played an equally important role had better knowledge 49(47.1%), whereas those who believed the surgeon alone had the most important role tended to have poorer knowledge 36(78.3%) (Table 2).

Participants who recognised the importance of preoperative assessment of patients demonstrated significantly higher good knowledge 104(100%) (p<0.001). Similarly, those who identified asking for investigations and consultations, as well as deciding on a patient's fitness to undergo surgery had significantly higher levels of good knowledge (p<0.001).

In terms of intraoperative roles, recognising the importance of continuously monitoring the patient without leaving the OR was associated with significantly higher good knowledge (p<0.001). Additionally, 104(100%) participants with good knowledge correctly identified that waking the patient up in the OR at the end of the surgery is the role of the anaesthesiologist (p=0.028).

With respect to postoperative roles, only the responsibility of escorting the patient to the recovery room showed a significant difference; 96(92.3%) with good knowledge compared to 27(58.7%) with poor knowledge (p<0.001).

Regarding outside-the-theatre roles, 61(58.7%) participants with good knowledge being aware of anaesthetists' role in managing patients in the intensive care unit (ICU), and 51(49%) being aware of the role related to chronic and acute pain management (p<0.001) (Table 3).

## Discussion

Anaesthesiology has significantly evolved as a speciality over the past few decades. Anaesthesiologists now have a vital role in perioperative care, labour analgesia, intensive care, and pain management. Traditionally seen as a behind-the-scenes speciality, anaesthesiology has expanded beyond the confines of the OR, with the contributions of anaesthesiologists increasingly recognised in pain clinics, labour analgesia, emergency care and the ICU.[8,9]

In the current study, recognising anaesthesiologists as specialists and understanding their preoperative, intraoperative, postoperative, and ICU roles correlated with significantly higher knowledge levels, highlighting gaps in patient awareness. The findings align with previous studies, highlighting a general lack of public understanding regarding the responsibilities of anaesthesiologists, particularly in developing countries.[3,4]

The perception of anaesthesiologists as doctors was recognised by 19.51% of the illiterate population, 58.57% of those with a graduate education, and 87.88% of the postgraduate population. Awareness of anaesthesiology as a distinct medical discipline was unknown to 100% of the illiterate group, 73.87% of individuals with up to a matriculation level education, 64.29% of graduates, and 51.52% of postgraduates. Among those with some knowledge of general anaesthesia, none from the up-to-matriculation group and 33.87%, 44.83% and 100% from the graduate, postgraduate, and medical undergraduate groups, respectively, were aware that anaesthesia involves specialised equipment and monitoring. Illiterates lacked knowledge about regional anaesthesia, while most others had some understanding of it. These results highlight the pervasive ignorance and misconceptions about anaesthesiology and anaesthesiologists, which has also been reported by a study in India.[10] Additionally, prior anaesthesia exposure, higher educational background,

and recognition of anaesthesiologists as specialists were significantly associated with better knowledge levels, consistent with earlier findings.[7,11] Similarly, research from Nepal and Jordan demonstrated that education level plays a crucial role in patients' understanding of anaesthesia, with higher knowledge observed among university graduates compared to those with lower educational attainment.[12,13]

In the current study, younger patients (age ≤40 years) exhibited lower levels of knowledge compared to older participants, which is a trend also reported in earlier studies[14,15]. They founded that majority of respondents incorrectly attributed anaesthesiologists' preoperative roles to surgeons, reinforcing the misconception that anaesthesiologists only administer anaesthesia, and are not involved in perioperative care. Similarly, the current results indicate that misconceptions persist regarding anaesthesiologists' intraoperative and postoperative responsibilities, despite their critical role in continuous monitoring and pain management.

A study[16] found that those with higher education levels displayed significantly better knowledge of anaesthesiology and the role of anaesthesiologists compared to individuals with lower education levels ($p<0.05$). Despite the greater part (62%) having undergone prior surgery, 48% of the participants were unaware of the basic aspects of anaesthesia, with no significant difference ($p>0.05$) in knowledge between those with and without prior surgical experience. Additionally, 90% of the participants were unfamiliar with the complications and types of anaesthesia, and 44% did not recognise that an anaesthesiologist is a medical doctor. Similarly, the current research indicates that prior anaesthesia exposure and higher educational backgrounds are associated with increased knowledge levels.

It is concerning that most patients in the current study had limited knowledge about anaesthesia, including its various types, techniques, and the roles of anaesthesiologists both inside and outside the OR. Despite the critical contributions of anaesthesiologists in various settings, there remains a significant lack of awareness about anaesthesiology as a speciality and the specific roles of anaesthesiologists. While this knowledge gap may be partly due to the low educational levels of the patients, it underscores the need for greater efforts by the anaesthesiology community to enhance patient education.

Studies have found that while most patients recognise anaesthesiologists as doctors specialising in anaesthesia, many are unaware of their broader roles in pain management, intensive care, and blood transfusion.[17] Education level and previous surgical experience positively correlate with better understanding of anaesthesiologists' duties.[5]

The current study has a few strengths, including clearly defined primary and secondary outcomes, which focussed on assessing patients' knowledge about anaesthesia and the roles of anaesthesiologists. This clarity helps in evaluating the specific aspects of knowledge that were targeted, and the study also used a structured questionnaire to assess knowledge, which was administered by the primary investigator or co-investigator. This approach helps in maintaining consistency in how data is collected.

The current study also has a few limitations, as it was conducted at a single centre which may have limited the generalisability of the findings to other settings or populations. Results might not apply to patients outside the geographical area, as data collection was conducted through direct questioning by the investigators, and there is a possibility of response bias where participants might have provided socially desirable answers rather than honest responses. Another important limitation of the study is that the questionnaire was developed by combining and adapting items from two previously validated instruments.[7,16] Though a pilot study and internal consistency testing were not conducted, face and content validity were ensured through expert review. The use of validated source items supports the construct representation of the tool. However, future studies should explore psychometric validation including reliability measures and factor structure.

Anaesthesiologists should allocate more time in pre-anaesthesia evaluation (PAE) clinics to thoroughly explain the role of anaesthesia, its different categories and procedures, its benefits, potential complications, and the potential side-effects. They should also discuss labour analgesia, and informed consent for anaesthesia, and clearly outline their responsibilities both inside and outside the OR. Additionally, anaesthesiologists need to increase their visibility through media outreach, conduct health fairs to educate the public about anaesthesia and the role of anaesthesiologists. and collaborate with surgeons to enhance overall patient understanding of this speciality.

## Conclusion

Many patients, including those with previous surgeries, were unaware of the role of anaesthesia, and the responsibilities of anaesthesiologists both inside and

outside the OR. By explaining their role and the importance of anaesthesia in resuscitation, anaesthesiologists can help patients move from uncertainty to understanding. This can be accomplished by dedicating more time to preoperative assessment clinics, interacting more with patients, and using media, public health events, and personal interactions to better inform and prepare patients before surgery.

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**Conflict of Interest:** None.

**Source of Funding:** None.

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## Annexure

**Reporting checklist for cross sectional study.**

Based on the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) cross-sectional guidelines.

**Instructions to authors**

Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below.

Your article may not currently address all the items on the checklist. Please modify your text to include the missing information. If you are certain that an item does not apply,

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please write "n/a" and provide a short explanation.
Upload your completed checklist as an extra file when you submit to a journal.
In your methods section, say that you used the STROBE cross sectional reporting guidelines, and cite them as:
von Elm E, Altman DG, Egger M, Pocock SJ, Gotzsche PC, Vandenbroucke JP. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement: guidelines for reporting observational studies.

| | | Reporting Item | Page Number |
|---|---|---|---|
| **Title and abstract** | | | |
| Title | #1a | Indicate the study's design with a commonly used term in the title or the abstract | 1 |
| Abstract | #1b | Provide in the abstract an informative and balanced summary of what was done and what was found | 2 |
| **Introduction** | | | |
| Background / rationale | #2 | Explain the scientific background and rationale for the investigation being reported | 3 |
| Objectives | #3 | State specific objectives, including any prespecified hypotheses | 3 |
| **Methods** | | | |
| Study design | #4 | Present key elements of study design early in the paper | 4 |
| Setting | #5 | Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection | 4 |
| Eligibility criteria | #6a | Give the eligibility criteria, and the sources and methods of selection of participants. | 4 |
| | #7 | Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable | 4 |
| Data sources / measurement | #8 | For each variable of interest give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group. Give information separately for for exposed and unexposed groups if applicable. | 4 |
| Bias | #9 | Describe any efforts to address potential sources of bias | 4 |
| Study size | #10 | Explain how the study size was arrived at | 4 |
| Quantitative variables | #11 | Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen, and why | 4-5 |
| Statistical methods | #12a | Describe all statistical methods, including those used to control for confounding | 4-5 |
| Statistical methods | #12b | Describe any methods used to examine subgroups and interactions | 4-5 |

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| Statistical methods | #12c | Explain how missing data were addressed | 4-5 |
| Statistical methods | #12d | If applicable, describe analytical methods taking account of sampling strategy | n/a |
| Statistical methods | #12e | Describe any sensitivity analyses | n/a |
| **Results** | | | |
| Participants | #13a | Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed. Give information separately for for exposed and unexposed groups if applicable. | 6-7 |
| Participants | #13b | Give reasons for non-participation at each stage | n/a |
| Participants | #13c | Consider use of a flow diagram | n/a |
| Descriptive data | #14a | Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders. Give information separately for exposed and unexposed groups if applicable. | 6-7 |
| Descriptive data | #14b | Indicate number of participants with missing data for each variable of interest | n/a |
| Outcome data | #15 | Report numbers of outcome events or summary measures. Give information separately for exposed and unexposed groups if applicable. | 6-7 |
| Main results | #16a | Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included | 6-7 |
| Main results | #16b | Report category boundaries when continuous variables were categorized | 6-7 |
| Main results | #16c | If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period | n/a |
| Other analyses | #17 | Report other analyses done—e.g., analyses of subgroups and interactions, and sensitivity analyses | n/a |
| **Discussion** | | | |
| Key results | #18 | Summarise key results with reference to study objectives | 8 |
| Limitations | #19 | Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias. | 11 |
| Interpretation | #20 | Give a cautious overall interpretation considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence. | 8-11 |
| Generalisability | #21 | Discuss the generalisability (external validity) of the study results | 11 |

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|---|---|---|---|
| **Other Information** | | | |
| Funding | #22 | Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based | 12 |

**None The STROBE checklist is distributed under the terms of the Creative Commons Attribution License CC-BY. This checklist can be completed online using** https://www.goodreports.org/, a tool made by the EQUATOR Network in collaboration with Penelope.ai

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**AUTHOR'S CONTRIBUTION:**
**KMS:** Concept, design, drafting. final approval and agreement to be accountable for all aspects of the work.
**FI:** Data acquisition, drafting, final approval and agreement to be accountable for all aspects of the work.
**BS & MAA:** Data acquisition, revision and final approval and agreement to be accountable for all aspects of the work.