

# Health literacy and patient comprehension in the pre-anaesthetics consultation

**Dr. Michael J.M. Russell**  
BAppSc (Phy), MBBS  
Intern, Wollongong Hospital

*Michael's medical interests lie in anaesthetics, orthopaedic surgery and emergency medicine, especially in trauma. In his spare time he enjoys playing and writing music, and is a keen sportsman.*

**Dr. Judy Mullan**  
PhD, FSHPA, BPharm, BA  
Academic Theme Leader for Research  
and Critical Analysis  
Graduate School of Medicine  
University of Wollongong

*Judy is a senior lecturer at the University of Wollongong Graduate School of Medicine, and enjoys the challenge of improving medical students' research capabilities.*

**Dr. Timothy Billington**  
PhD, BSc  
Lecturer in Medical Education and  
Medical Sciences  
Graduate School of Medicine  
University of Wollongong

*Timothy relishes the opportunity to educate and enthuse medical students in the basic sciences.*

**Background:** The concept of health literacy and patient comprehension is important, especially in the area of patient consent for surgical procedures. This extends to the pre-admissions anaesthetic consultation where poor patient health literacy can have an impact on the patient's comprehension of risks. **Objectives:** This exploratory study aims to investigate the level of health literacy and comprehension in a population of patients attending a pre-admissions anaesthetic clinic. **Methods:** A cross-sectional study design was used to survey adult participants ( $\geq 18$  yrs old) attending a regional based pre-anaesthetics clinic. Information gathered as part of the survey included demographic information, health literacy scores (via a previously validated tool), and questions pertaining to the comprehension of their consultation. **Results:** In total, 51 patients participated in the study. Patients were divided into two subgroups (inadequate/marginal vs. adequate), depending on their screened level of health literacy. Those with inadequate/marginal health literacy were significantly more at risk of having inadequate comprehension than those with adequate health literacy ( $p = 0.01$ ). There was no statistically significant difference between health literacy levels and a variety of demographic indicators, including education level and employment status. **Conclusion:** Patients with inadequate or marginal screened health literacy scores were less likely to comprehend the information provided to them as part of their pre-admissions consultation. These results suggest that screening patients for their health literacy levels may be advantageous, in that information provided can be tailored to their individual needs. Further research is however required.



Inadequate or poor health literacy has been linked with poor health outcomes. [3,4] These poor health outcomes result from a combination of factors which include but are not limited to: poorer health-related knowledge and comprehension, [3] difficulty understanding diagnosis and treatment recommendations, [5] inappropriate use of resources – including decreased use of preventative health measures and an increase in emergency department presentations [4] and poor medication compliance. [6] Poor health literacy can further negatively impact on older adults, who are more likely to experience poorer overall health status [7] and higher mortality rates, [8,9] as compared to older adults with adequate health literacy.

Pre-admissions anaesthetic clinics are used to deliver important information to patients. Consultations within these clinics aim to ensure that the patient is optimally prepared for the operation or surgical procedure by providing them with relevant and essential information. [10] A comprehensive pre-admissions anaesthetic consultation and assessment is a valuable exercise because it can result in reduced: in-patient length of stay following the procedure/surgery, [11] case cancellations and/or further delays on the day of the procedure/surgery. [12] Two of the key elements communicated to patients during the pre-anaesthetics consultation include the risks involved with the procedure/surgery and the potential risks associated with receiving anaesthetic agents. This information is typically provided to patients using both verbal and written communication strategies, [13] which can be inadequately comprehended by the patient with poor health literacy skills. [14]

A recent study conducted by Kadakia et al., [15] identified that inadequate health literacy could potentially predict poor patient

## Introduction

Health literacy is broadly defined by the World Health Organisation (WHO) as the “cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand, and use information in ways which promote and maintain good health”. [1] By using this definition, the concept of health literacy is more than just encompassing health education and communication – it also addresses the underlying environmental, political, and social factors that can determine health. It is important to note that health literacy does not just encompass the ability of a patient to understand a diagnosis or make an appointment, but is also critical for good patient engagement with the medical system. This is important in an Australian context as research suggests that up to 59% of Australians have inadequate health literacy skills. [2]

comprehension of their orthopaedic injury and surgical intervention – including understanding the risks involved with the procedure. It could be argued therefore, that there is a rationale for screening for health literacy levels, and identifying those at risk of poor comprehension, as part of the pre-admissions anaesthetic clinic routine practices. By screening and identifying these patients, additional measures could be used by the physician to ensure the optimisation of patient understanding, including understanding of potential risks associated with the procedure. However, there appears to be a paucity of evidence regarding a patient’s understanding of the pre-admission anaesthetic consultation, and the effect of health literacy in predicting comprehension of information provided to them during these consultations.

This exploratory pilot study aimed to assess the level of health literacy and comprehension of health information delivered to patients attending a regional pre-admissions anaesthetic clinic.

## Methods

Following human ethics approval from the University of Wollongong Human Research Ethics Committee (Ethics No. GSM13/048), this study utilised a cross-sectional survey design which included the self-completion of an anonymous questionnaire. Upon verbal consent being given, participants aged 18 years and above were provided with a questionnaire by the clinic nursing staff, which was to be completed at the end of the pre-anaesthetics consultation. The clinics were run either by an anaesthetic consultant, or by a qualified GP anaesthetist, and was set in a New South Wales based regional pre-admissions anaesthetics clinic.

Potential participants presented to the pre-admissions anaesthetics clinic for a wide range of elective surgical procedures, including; ophthalmic, Ear/Nose/Throat (ENT), orthopaedic, and general surgical procedures. The anonymous questionnaire comprised three components. The first component gathered demographic information. The second component included the following three validated health literacy questions, [16,17] which were rated on a 5-point Likert scale:

- How often do you have someone help you read hospital materials? (5 = ‘Never’; 4 = ‘Occasionally’; 3 = ‘Sometimes’; 2 = ‘Often’; 1 = ‘Always’).
- How confident are you filling out medical forms by yourself? (5 = ‘Extremely’; 4 = ‘Quite a Bit’; 3 = ‘Somewhat’; 2 = ‘A Little Bit’; 1 = ‘Not At All’).
- How often do you have problems learning about your medical condition because of difficulty understanding written information? (5 = ‘Never’; 4 = ‘Occasionally’; 3 = ‘Sometimes’; 2 = ‘Often’; 1 = ‘Always’).

These three questions were chosen based on a previously validated system for stratifying health literacy in an efficient and rapid manner. [17] In order to analyse health literacy in this patient population, participants were stratified into either adequate or inadequate/marginal health literacy. Those participants with a response of ‘Somewhat’ or ‘Sometimes’ (correlating with a Likert score of 3) and below were deemed to have either inadequate or marginal health literacy. Deficiency in one or more of the three questions was deemed sufficient to classify patients as having overall inadequate or marginal health literacy. Those above this cut-off for all three questions were deemed to have adequate health literacy.

The third component of the questionnaire included seven questions about the patient’s comprehension of information provided during the pre-anaesthetics consultation, which have not been previously validated. They included a range of questions about health information, which is commonly discussed during pre-anaesthetic consultations. Responses to the following seven questions were categorised via three responses; yes, no, and unsure:

- Do you know what operation or procedure you are having? (Yes,

No or Unsure).

- Do you understand why you are having the operation or procedure? (Yes, No or Unsure).
- Do you understand the potential complications of your operation or procedure? (Yes, No or Unsure).
- Do you understand the potential complications of the anaesthesia? (Yes, No or Unsure).
- Do you understand where you will be after your operation or procedure? (Yes, No or Unsure).
- Do you know what to expect after you wake up? (Yes, No or Unsure).
- Was there one or more times during your time with the doctor where you were not sure of what he was saying? (Yes or No).

To score patient comprehension, the results of this third component of the anonymous questionnaire were tabulated and a score out of seven given. A score of 1 was given for each affirmative response for the first six questions. For the final question, a score of 1 was given if the patient understood the anaesthetist throughout the entirety of the consultation. A patient with a total score of  $\geq 6$  was deemed to have adequate comprehension of the consultation, whereas any patient with a total score  $< 6$  was deemed to have inadequate comprehension. This measure of patient comprehension was devised for this study, and is not based on any previously validated tools. Consequently, this is an exploratory study and the scoring system for comprehension will need validation in the future. Descriptive statistics were used to analyse the data. Associations between variables were analysed using chi-square analysis. [18] The level of significance was set at  $p < 0.05$ .

## Results

### *Patient Characteristics*

A total of 51 responses were received from study participants between February and April 2014, with all received questionnaires completed in a satisfactory manner. The mean age of the participants was  $64.8 \pm 13.6$  years, with the ages ranging from 18 to 84 years. In the majority of cases, participants were from either the category “had completed high school” or “had not finished”, and 61% of the participants were not in the labour force. (Table 1)

### *Health Literacy and Patient Comprehension*

Of the total participants, 76% ( $n = 39$ ) were deemed to have adequate health literacy, as compared to 24% ( $n = 12$ ) with inadequate/marginal health literacy. In addition, the majority of the participants ( $n = 43$ ; 84%) had adequate comprehension scores of the consultation, rather than inadequate comprehension scores ( $n = 8$ ; 16%). When the comprehension scores are viewed within each health literacy grouping, 42% ( $n = 5$ ) of those with inadequate/marginal health literacy also had inadequate comprehension. The proportion of those with inadequate comprehension was less amongst those with adequate health literacy ( $n = 3$ ; 8%). These statistics are reflected in figure 1.

### *Analysis*

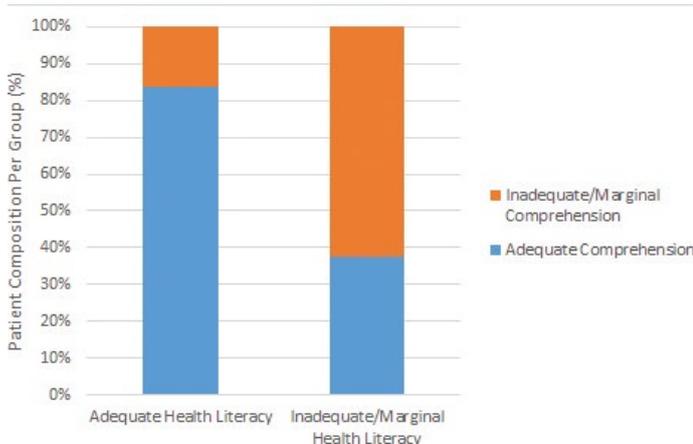
Chi-square analysis demonstrated that there was a statistical difference between the two groupings of health literacy in relation to their comprehension of the anaesthetics consultation ( $p = < 0.01$ ). Chi-square analysis was also performed in regards to employment status (employed vs. unemployed/not in labour force) and education level attained (education of High School or lower vs. education beyond High School). These groupings were used due to the low level of participants in some groups. There was no statistically significant difference between the previously stated health literacy groups in regards to both level of education attained ( $p = 0.356$ ) and employment status ( $p = 0.494$ ) at the time.

## Discussion

The issue of patient comprehension in the delivery of information regarding the pre-admissions anaesthetic consultations and procedural risks cannot be understated. Without the ability to correctly understand and interpret both verbal and written information patients

Variable	Category	Number of Participants (%)
Gender	Male	30 (59%)
	Female	21 (41%)
Level of Education Attained	Did Not Complete High School	10 (20%)
	Completed High School	28 (55%)
	Diploma or Advanced Degree	6 (12%)
	Bachelor Degree and Above	7 (14%)
Employment	Not in Labour Force	31 (61%)
	Unemployed	6 (12%)
	Employed	14 (27%)

**Table 1:** Participant Characteristics



**Figure 1:** Associations of Health Literacy with Patient Comprehension

will be unable to provide accurate consent to their procedure, and they will also be at risk of poor health outcomes because they may have misunderstood important information regarding their procedures. If we could identify this at-risk patient group by using a quick and cheap assessment of health literacy, additional resources and techniques could be utilised to improve patient understanding that would otherwise be absent in the standard pre-admissions anaesthetic consultation. Upon analysis of the data, a significant difference was found between the health literacy groups in terms of comprehension of the pre-anaesthetics consultation.

The findings of patient comprehension in the pre-admissions anaesthetics consultation mirror that of a number of other studies. Similar findings by Kadakia [15] and Wallace [19] show that a lower level of health literacy can place patients at risk of poor comprehension. This can and has been used as a predictor for patients at risk of misinterpreting health care information. For example, the study by Kadakia [15] examined comprehension and health literacy in an orthopaedic trauma patient population. They used the same questions by Chew et al. [16] to delineate patients into inadequate and adequate health literacy, and then tested patient comprehension and knowledge of their procedure. They found a significant link between poor health literacy and poor patient comprehension and retention of information about their procedure. However they also found that patient comprehension depended on educational level, which was not replicated in this study. This may have been due to the larger sample size of the Kadakia study. However, their suggestion of an increased focus on patient communication by medical staff can also be applied in the pre-anaesthetics consultation.

#### Predicting Patient Comprehension

Since this study demonstrated that health literacy can have an impact on overall patient comprehension, it could be recommended that

screening of health literacy should be an important addition to pre-anaesthetic clinic consultations. Doing so would help to identify those patients at greatest risk of poor comprehension and would allow for the delivery of information, which was targeted toward individual patient needs. The anaesthetists in this study could then have improved patient comprehension by employing a variety of techniques. These could include using simple and easy to understand language and by speaking slowly, [20] asking patients to repeat back basic information [21], and by having a longer consultation time. [22]

One component that this study did not explore was the effect that supplementary information can have on further improving patient comprehension. In theory patient leaflets should be a very useful tool in assisting patients with comprehension of their medical procedure and management of their condition, before and after their procedure. However, many patient information leaflets are written at levels in excess of the mean patient literacy, [23] often including too much information, which may be irrelevant to the patients' needs. [24] Information provided to patients during these education sessions, should therefore be aimed at an appropriate level for the target audience. Furthermore, using culturally appropriate images that are linked to either spoken or written information can also be additional useful strategies to help improve patient retention and comprehension of health information provided during consultations. [25]

#### Limitations and Future Research

The nature of the current study resulted in a small sample size, without the assumed entirety of patients presenting to the pre-anaesthetics clinic being sampled. This small sample size limits the statistical power of the study. It is also possible that some of the non-significant differences may trend towards significance with a larger sample size. Due to the study being an anonymous survey, it would be speculative to estimate patient uptake of surveys. In addition, those patients with poor health literacy and/or patient comprehension may not have attempted to complete the questionnaire. This introduces a level of selection bias towards those with higher levels of health literacy, something that could be potentially avoided if it was a compulsory part of the pre-anaesthetics consultation workup. In addition, assistance could be provided to these patients in completing the survey after their consultation. The exploratory nature of the study, as well as the use of a scoring system for comprehension that has not been validated, also limit this study. In particular, validation of the scoring criteria for comprehension would be vital. Furthermore, measurements of both inter-rater and intra-rater reliability were not performed.

There were also a number of confounding factors, which need to be considered as part of the current study. For instance, different anaesthetists were involved throughout the duration of the study. As a result this study was unable to allow for the potential differences in information delivery from each of these health professionals. It is also feasible that word of mouth from the study may have led to the anaesthetists themselves changing their approach to information delivery. Additionally, due to the variety of surgical specialties and procedures that were included, it is possible that the complexity of the procedure would have influenced the patient's comprehension. In light of this variety in the delivery of information, perhaps future inclusion of a patients' overall satisfaction with the delivery of health information would be beneficial, as well as the anaesthetists overall impression of the patient's level of health literacy and comprehension of the consultation.

Language could be seen as another confounding factor and barrier to comprehension of the anaesthetic process. In fact, this could also have led to some patients declining to enter the study itself. This could be avoided in future studies by either excluding patients from a Non-English Speaking Background (NESB), or utilising this as an additional demographic data for future analysis. The patient's postcode and socio-economic status could also have a profound effect on health literacy and patient comprehension, and were not assessed in this study.

In terms of the patient understanding the anaesthetist, perhaps a qualitative component could be included in future studies. From this, we could further investigate barriers and facilitators, which may have impacted upon the patient's ability to understand their anaesthetist. Moreover, future studies could also assess patient recall regarding important information imparted to them as part of the consultation. An additional component that should be included in future analysis is the proportion of patients who returned surveys out of the entire population presenting to the pre-anaesthetics clinic.

The results of this study warrant further research, potentially by addressing the limitations addressed above. This would include a larger sample population size, over a longer period of time, and should potentially include multiple sites. In addition, developing a validated scoring of comprehension would be beneficial in future analysis. By increasing the sample size and including a validated score of comprehension, stronger statistical analysis could be performed. A study of this kind could be replicated in a variety of areas of medicine where comprehension of risks and complications is needed.

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## Conclusion

The results of this study suggest that screening for at-risk patients prior to attending a pre-admissions anaesthetic clinic may be beneficial in identifying patients with poor health literacy. Such individuals could have information tailored to maximise comprehension of the pre-admission anaesthetic consultation. Further research in these areas is warranted.

## Acknowledgements

The author would like to thank both Dr Judy Mullan and Dr Timothy Billington from the University of Wollongong Graduate School of Medicine for their support and advice for the duration of this project.

## Conflict of interest

None declared.

## Correspondence

M Russell: [mr828@uowmail.edu.au](mailto:mr828@uowmail.edu.au)

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