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**INVESTIGATING THE IMPACT OF EDUCATIONAL LEVEL ON THE  
WILLINGNESS OF PATIENTS TO ALLOW RESIDENTS TO PERFORM SURGERY.**

**PRANITH PERERA**

## **Abstract**

*Objective:* To explore if previously reported discrepancies, between educational level and comprehension of informed consent, affects the end outcome of voluntarism for surgery performed by a resident.

*Methods:* Questionnaires were distributed to female patients at an outpatient Women's health clinic at a University Hospital. Patients were questioned using a 10 point scale (0 indicating not comfortable, 10 indicating the very comfortable) on their comfort levels with having surgery performed on them by a resident who was consistently supervised, supervised during important steps only, minimal supervision with attending in close proximity. Additionally patients were asked to about their level of education (Less than elementary, Elementary, Middle School, High School, Some College, 2 Year Degree, 4 year Degree, Post-Graduate). The collected surveys were then analyzed using simple linear regression to determine if there was a correlation between the reported comfort levels and level of education.

*Results:* 136 patients completed the questionnaire to determine comfort levels and level of education. Analysis showed that reported levels of comfort showed no statistically significant correlation with level of education.

*Conclusion:* A lower level of education did not contribute to the level of comfort reported by a patient on receiving surgery from a resident under decreasing levels of supervision.

## **Introduction**

The process of informed consent was first established by the Belmont Report in 1979, a report conducted by the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research.<sup>1</sup> The Belmont Report requires that “respect for persons incorporates at least two ethical convictions: first, that individuals should be treated as autonomous agents, and second, that persons with diminished capacity are entitled to protection.”<sup>2</sup> The validity of the informed consent (IC) relies on physician and patient establishing voluntarism, understanding and autonomy with regards to studies and procedures.<sup>3</sup> The importance of establishing a merited IC is something that has been studied in the realms of ethical and legal issues<sup>4</sup>. As such several limitations of the consenting procedure have been identified and discussed at length.<sup>5, 6</sup> An important factor that has been identified as a potential barrier against the validity of the consent process is the subject’s or patient’s education level.<sup>7,8</sup> Studies have shown that patients with a lower educational level (below high school) are more likely to score poorly on comprehension scores of IC content; physicians have also scored poorly in acknowledging such disparities during the consenting process.<sup>9,10</sup>

The implications of such disparities need to be further examined to see if they play a greater role in the ultimate decision of a patient to accept a physician’s involvement in performing his/her surgery. Patients of a lower educational level, examined as below high-school and college in different studies, have shown a lower understanding of the academic hierarchy specifically with the terms ‘intern’ and ‘resident’ and their corresponding experience.<sup>11,12,13</sup> As such it is important to establish if a patient’s educational level plays a role in the decision making process of undergoing

surgery performed by a resident. We constructed a study to determine if a lower educational level affected the level of comfort a patient would have to undergo surgery performed by a resident under decreasing levels of attending supervision.

## **Methods**

### *Experimental Design*

This study was a descriptive, correlation design that used a questionnaire survey administered to female patients at an outpatient Women's health clinic at University Hospital in Albuquerque. The clinic is staffed by academically-based obstetrics and gynecology attendings, fellows, residents and interns. During a period of 5 months patients were approached, during their physician's visit, by the clinic nurses, to participate in a questionnaire. All Patients were 18 years or older, able to read English, with or without a history of a prior surgical procedure of any kind. Children under the age of 18 and women who were unable to read English were excluded.

Approval for the study was obtained from the Institutional Review Board.

### *Questionnaire*

Participants were asked 34 questions [Appendix A] which explored their educational level, experience with surgery and the consenting process as well as their level of comfort on the level of supervision a resident receives during the surgical procedure. Demographic data on age, level of education (less than elementary, elementary, middle school, high school, some college, 2 year college, 4 year college and post-graduate) and profession were collected.

Participants were given a 10-point scale (0 indicating completely comfortable and 10 indicating extremely uncomfortable) to indicate their level of comfort with surgical procedures performed by a resident under complete supervision, supervision during critical steps and minimal supervision with an attending within proximity should complications arise. A 10-points scale was also used to collect data concerning views held on their surgeon's characteristics and a 3-point scale was used to explore what information participants believed would be helpful during a consenting procedure. Such ancillary data was obtained to be used in a different study further investigating the role of informed consent from a patient's perspective.

Items in the questionnaire were discussed with the research team and informally discussed with the nursing team prior to its distribution.

#### *Description of study participants*

A total of 140 female patients participated in the questionnaire with an age range of 18 – 83, average age 49.8 years [See table 1]. Out of the 140 participants, 1 participant did not enter any information regarding the level of education; thus the remaining 139 participants showed a range of education varying from 3 years (less than elementary) to 19 years (post-graduate) with an average of 13 years of education. 125 of the 140 participants had a history of surgery prior to the questionnaire administration, with the median surgery type being gynecological [See graph 1]. Out of the 125 participants who reported a prior history of surgery, the mean length of time passed since the last surgery was 105 months (Range 0.38m – 600m).

### *Statistical Analysis*

Statistical analyses statistics were performed using Statgraphics Plus for Windows Version 4.1. All categorical variables were evaluated using counts and proportions. Descriptive statistics included ranges, means, 95% confidence intervals using a Type I error rate of 0.05 (two-tailed significance). Categorical variables were evaluated using counts and proportions; numeric variables were evaluated using standard summary statistics. The relationship between education level and response to the 3 comfort items on the survey instrument were evaluated using simple linear regression.

### **Results**

Of the 140 questionnaires returned, 136 showed completed sections for the comfort level portion of the questionnaire (four questionnaires showed blank sections). Comfort levels reported for study participants showed a decrease in mean response values for undergoing surgery by residents under the decreasing levels of supervision [See table 2]. Study participants showed a decrease in their level of comfort with a corresponding decrease in the level of supervision of the resident by the attending [See graphs 2]. A simple linear regression showed that educational level was not strongly related to the comfort scores regarding surgical residents who were supervised closely (Correlation Coefficient -0.09,  $p = 0.32$ ); supervised during important steps only (Correlation Coefficient 0.01,  $p = 0.88$ ); minimal supervision (Correlation Coefficient 0.01,  $p = 0.90$ ). [See table 3]

## **Discussion**

Our study showed that level of education did not bear any relationship with a patient's comfort level in undergoing surgery performed by a resident under decreasing levels of supervision. We found that a patient's level of education had no impact on the response to the three hypothetical situations of undergoing surgery with a resident who is consistently supervised, moderately supervised (attending present for important steps) and minimally supervised (attending is within close reach of the OR). We found that the end outcome of voluntarism does not differ based on a patient's educational level. This is in contrast to another study investigating the relationship between patient education level and comfort levels with regards to emergency room procedures performed by emergency medicine residents. These investigators showed that patients of a higher educational level (defined as greater than high school) were more likely to participate in the clinical teaching process than their lower education level counterparts.<sup>13</sup>

Informed consent is dependent on the clinician to determine that the patient has both voluntarism and understanding of information presented.<sup>14,15</sup> It has been established that perceptions of the consenting content can vary based on a patient's educational level.<sup>8</sup> Over-endorsement of IC content, decreased participation with the autonomy role has been reported in patients who report lower educational levels; thus demonstrating concern with the integrity of the consenting process.<sup>16</sup> The construct of understanding is also expounded in the clinical teaching environment. Studies have shown that once informed of the various experience levels there is a statistically significant increase in the reluctance of patients to participate in the resident's clinical teaching.<sup>17</sup> Educational level

has thus far been implicated on several levels as an important determinant in the intact process of informed consent.<sup>7</sup>

It is important to establish that in spite of these discrepancies, the concept of voluntarism still remains intact. Our findings do not abdicate the responsibility of a physician to ensure that adequate comprehension exists during the consenting process; an IC decision, though, should not be deemed irrelevant based solely on a patient's educational level. Such action would impede a patient's autonomy and thus impede the IC process as determined by the Belmont report. Additional studies need to be pursued to determine if other factors that are associated with but still external to level of education, such as literacy, are likely to impact voluntarism and informed consent.

#### *Study Limitations*

Our data was limited to women in which a majority (125/140) had a history of surgery prior to the study. It is feasible that the additional experience of undergoing surgery would factor in the decision to undergo a further surgery under the guise of a resident. An additional study including patients who had not undergone surgery would be necessary to ensure that surgery experience did not affect response scores. Study participants were also screened for English literacy. The concept of illiteracy and informed consent has been examined in studies pertaining to cancer therapies and education, however very little data is available concerning a possible effect on surgical consenting.<sup>18</sup> Our studied population also showed a skew towards a higher level of education and thus a bell curve distribution pattern was not observed. Such distribution however, when accounted for, would not show any statistical change in p-values.

## **Conclusion**

Participants in our study reported a decrease in comfort level when undergoing surgery with a resident under decreasing levels of supervision. Level of education did not show any statistically significant correlation with reporting of comfort levels of undergoing surgery performed by a resident with decreasing levels of supervision.

Further studies would need to be performed to determine if the same conclusion can be reached for patients with literacy issues as well as those who have not undergone prior surgery.

## Tables

[Table 1: Demographic data of study participants]

Age (years)	
Mean (SD)	49.8 (16.1)
Median	50
Range	18-83
Ethnicity	n (%)
American Indian	4 (0.03)
Asian	2 (0.01)
Black	3 (0.02)
Pacific Islander	0 (0)
White (Non-Hispanic)	69 (0.49)
Hispanic	56 (0.40)
Other	6 (0.04)
Education (Years of Education)	n (%)
Mean (years)	13
No Response	1 (0.07)
Less than Elementary (3)	1 (0.07)
Elementary School (6)	0 (0)
Middle School (8)	7 (0.05)
High School (12)	41 (0.29)
Some College, no degree (13)	32 (0.23)
2 year College (14)	11 (0.08)
4 year College (16)	23 (0.16)
Post Graduate Degree (19)	23 (0.16)
Previous Surgery	n (%)
Yes	118 (97)
No	4 (3)

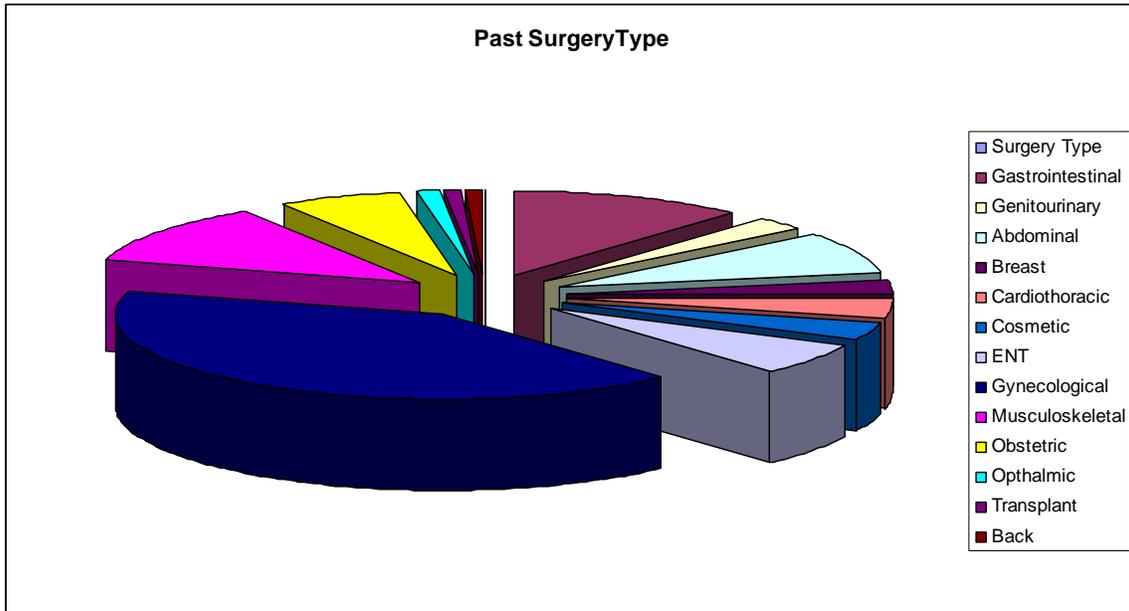
[Table 2: Descriptive statistics for comfort scores reported by study participants on surgery performed by residents under varying levels of supervision]

<b>Level of Supervision</b>	<b>n</b>	<b>Median</b>	<b>Quartiles</b>	<b>Range</b>	<b>Mean (SD)</b>
Resident operates under the attending's consistent supervision	136	6	4.0, 8.0	0.0-10.0	5.8 (3.09)
Resident operates with attending present for important steps	136	5	2.0, 6.0	0.0-10.0	4.4 (3.10)

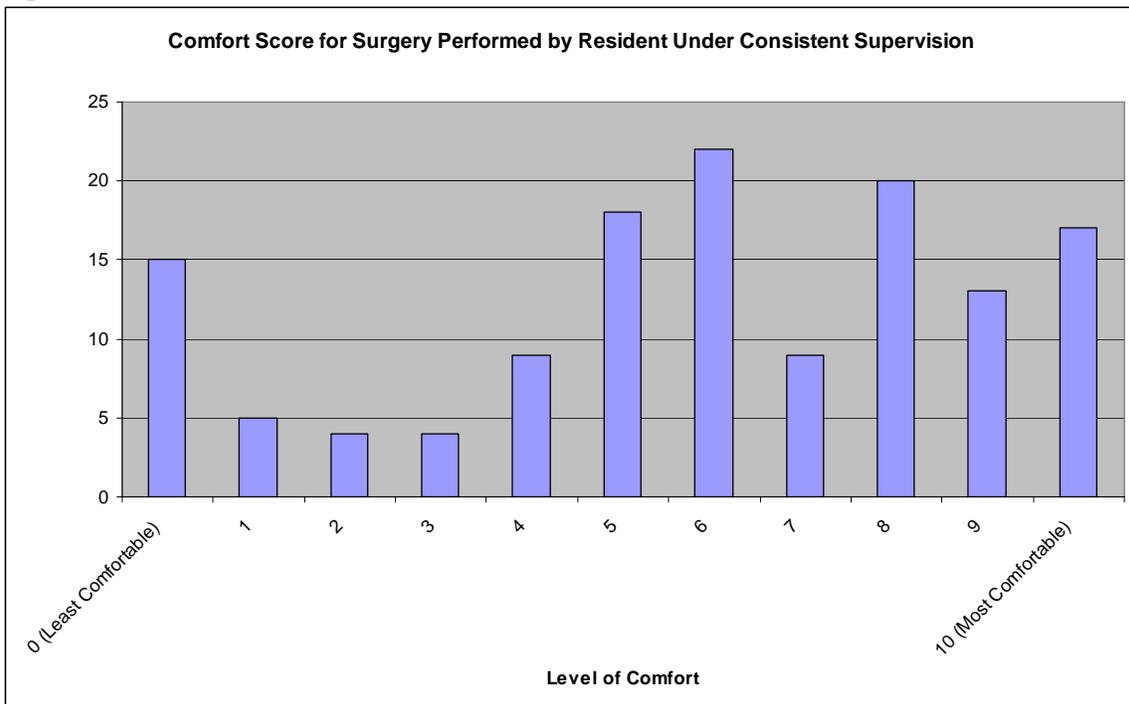
Resident operates under minimal supervision with attending close by	136	1	0.0, 3.0	0.0-10.0	2.0 (2.69)
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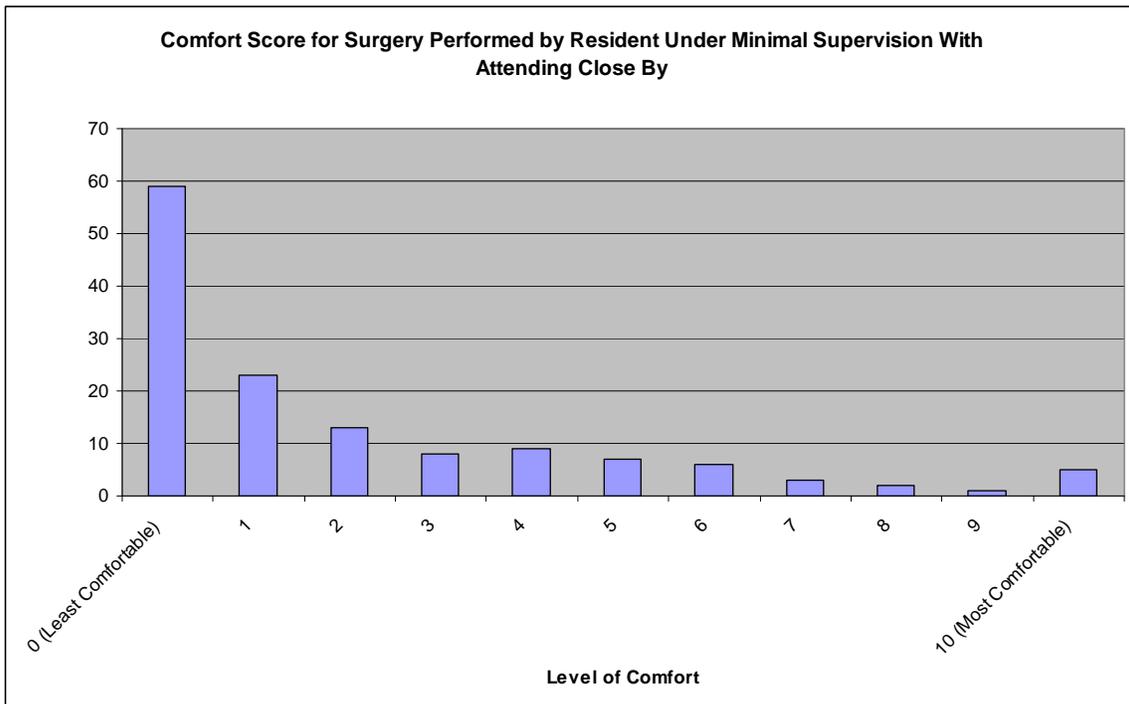
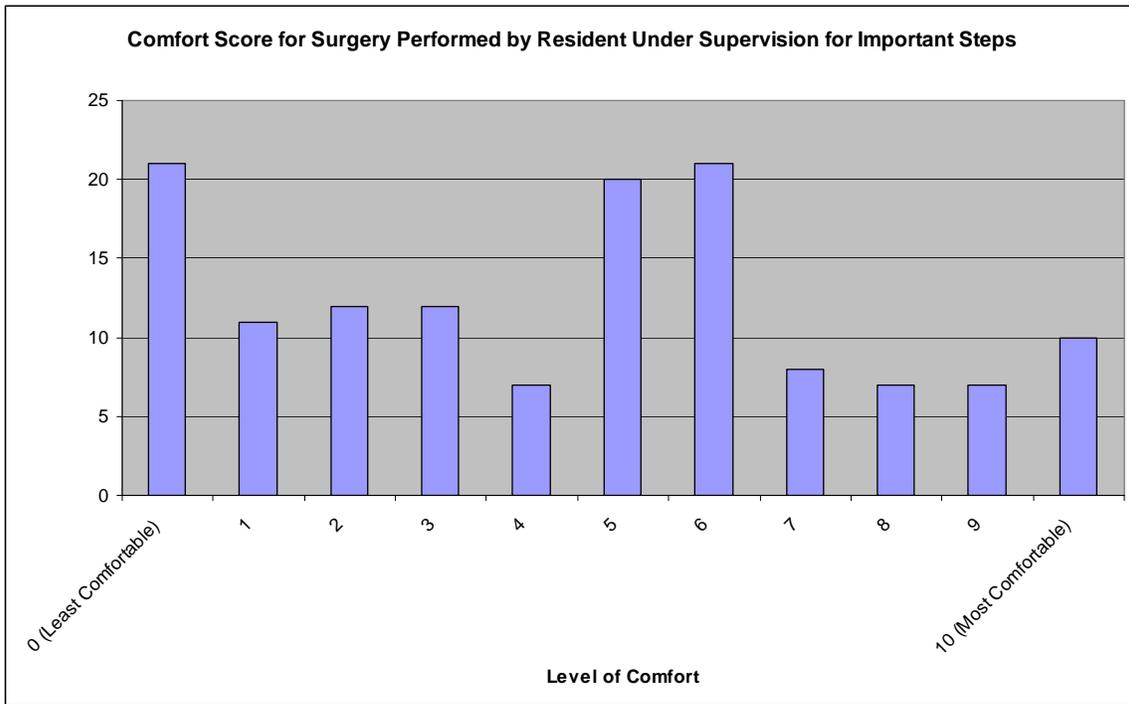
[Graph 1: Breakdown of previous surgeries]

Note: Abdominal surgery includes hernia repair, abdominal wall repair only



[Graphs 2: Comfort scores for surgery performed by residents under varying levels of supervision]





[Table 3: Correlation between Educational Level and Comfort Scores]

<b>Item</b>	<b>Supervision level</b>	<b>Correlation Coefficient</b>	<b>p-value</b>
<b>Resident Operating, Attending Outside OR</b>	least	-0.09	0.32
<b>Resident Operating, Supervision during Important Steps</b>	medium	0.01	0.88
<b>Resident Operating, Attending Supervising Closely</b>	most	0.01	0.90

## **Appendix A**

**[Please see attached Questionnaire]**

## References

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