



Difficulties in acquiring surgical skill among
surgical residents in Addis Ababa University,
Addis Ababa, Ethiopia, 2024

Summary Table

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I will declare that this is my original work and also not submitted partially or in its entirety to the department of surgery by anyone and that all resource and material used here have been acknowledged

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Acronym and Abbreviation

A	H
Addis Ababa University (AAU), 3	Hepatopancreatobiliary (HPB), 2
B	O
Briefing-Intraoperative-Debriefing (BID), 4	Objective Structured Assessment of Technical Skills (OSATS), 4
G	Ottawa Surgical Competency Operating Room Evaluation (O-SCORE), 5
General surgery Resident (GSR), 2	

1. Abstract

Background: Surgical skill acquisition is a critical component of residency training. However, various factors, such as burnout, resource limitations, and inequalities in learning opportunities, may hinder surgical residents' ability to develop essential competencies. This study investigates the challenges faced by surgical residents at Addis Ababa University, Ethiopia, in acquiring surgical skills.

Methods: A cross-sectional study was conducted among surgical residents at Addis Ababa University. Data were collected using a structured questionnaire that assessed demographic factors, burnout, access to resources, institutional support, feedback mechanisms, and perceptions of learning opportunities. Descriptive and inferential statistical methods were used to analyze the data.

Results: The findings revealed that a significant proportion of residents experienced burnout due to workload, irrelevant roles, and additional responsibilities. A lack of standard assessment and feedback mechanisms was reported by most participants, with 85% indicating that this negatively impacted their skill acquisition. Inequalities in learning opportunities were attributed to factors such as gender discrimination, dominance of relationships, and conflicts arising from fellowship programs. Limited availability of resources and inadequate institutional support were also significant barriers. Female residents and early-year trainees were disproportionately affected.

Conclusion: Surgical residents at Addis Ababa University(AAU) face multifaceted challenges in acquiring surgical skills, including burnout,

inequities, and insufficient institutional support. Interventions to standardize assessments, provide equitable opportunities, and enhance institutional support systems are essential to improve the training experience and skill acquisition for surgical residents.

2. Introduction

2.1 Background

Surgical residents often experience a tense environment in training arenas.(1) Their training in operating rooms faces several challenges, including a decline in academic records compared to the last century, demographic changes, economic constraints, and changes in attitudes toward surgery training, with an emphasis on patient safety . Research studies also show that some surgical residency graduates do not have the necessary qualifications.(2) Research studies also show that some surgical residency graduates do not have the necessary qualifications.(3) Researchers believe that traditional surgery training with senior/junior hierarchy in relationships cannot meet the need for learning complex technical skills in today's operating room, in a constrained period of residency training. The atmosphere of apprehension in the senior/junior residency training system for surgical residents causes rejection, resentment, and severe stress, which affect their learning.(4) In 2019, the American Society of Surgeons emphasized the necessity of adjustments in this training environment. According to the statement, harassment, coercion, and discrimination are three distinct interpersonal behaviors that can negatively affect professional relationships, job satisfaction, and physical/mental health. In addition to threatening the health of employees, these behaviors create a hostile work environment that can endanger the safety of patients.(5) Therefore, the improvement of this educational arena, ⁱdevelopment

of constructive communication, and creation of an interactive educational environment are emphasized.(6) On the other hand, training courses and working hours of residents have been affected by the financial issues of hospitals and economic pressures prevailing in medical centers.(7) As future health care practitioners, the better they are trained with opportune planning and practical training in a proper context, the more qualified employees would be to provide high-quality services.(8) Over the past few decades, the development of structured and efficient approaches to surgical courses, including attention to setting primary educational goals, efficient evaluation methods based on receiving feedback, and the use of effective teaching models has been highly emphasized .(9) In this regard, several educational models, including the Zwisch model, which provides both faculty and residents with specific stages of supervision, allow for adequate, safe training in a graduated manner to develop operative autonomy and fully trained surgeons. The other excellent model is Briefing-Intraoperative-Debriefing (BID) model that walks the learner through the surgery in three stages. During the briefing stage, the attending surgeon starts the conversation with a brief question about the goal of the operation or previous experiences. In the intraoperative stage, the attending surgeon will still coach and guide the resident through the operation and, finally, in the debriefing stage, the preceptor and learner debrief about the encounter. Also, assessment tools such as Objective Structured Assessment of Technical Skills (OSATS) are widely used to score the skills of each surgical trainee in performing or assisting in real operations. Similarly, Ottawa Surgical Competency Operating Room Evaluation (O-SCORE) is a 9-item surgical evaluation tool designed to assess technical competence in surgical trainees using behavioral anchors.(10, 11, 12, 13)

However, in many operating rooms, surgical residency training is still performed in a challenging and stressful environment, based on the

lecturer-student model in which residents must learn in a competitive situation through observation and by watching the performance of instructors or senior residents, performing the procedure under the supervision of senior residents, and eventually teaching junior residents during their residency course.(14) In this learning framework, they try to fulfill the assigned responsibilities of patient safety by adopting coping strategies in different encounters and avoiding conflicts, and at the same time, improving their surgical skills.(15) We conducted this research to identify major challenges that residents face during training and assess their satisfaction throughout their stay

2.2.Statement of problem

Despite advancements in surgical training methodologies, surgical residents often encounter difficulties in acquiring surgical skills effectively. This poses a significant challenge to both the residents' professional development and patient outcomes. Understanding the root causes of these difficulties is crucial for devising targeted interventions to enhance surgical training programs. Therefore, this research aims to explore and identify the key challenges faced by surgical residents in acquiring surgical skills in Addis Ababa University.

2.3.Significance of study

Surgical residency programs aim to equip residents with the necessary skills for autonomous practice. Studies on the challenges of skill acquisition can address the challenges properly will improve the quality of the residency programme and help the residents gain adequate skills to make them confident and ready for independent practice on graduation.

Pinpointing the particular obstacles that residents face can assist in customizing educational strategies to effectively tackle these difficulties. This could entail enhancing instructional techniques,

integrating simulation exercises, or offering extra support resources to enhance skill development. It helps to enhance surgical education.

Surgical errors can lead to severe repercussions for patients. By identifying the specific areas where residents face difficulties, measures can be devised to reduce errors and enhance the overall results of surgeries.

Surgical procedures require precision and expertise. Understanding the challenges residents face can lead to improvements in training programs, ultimately enhancing patient safety by ensuring that residents are adequately prepared before performing surgeries independently.

2. Literature Review

There is qualitative research that was done on experience of teaching and learning process in the operating room from May 2019 to June 2020 in Tehran and eight other cities in Iran. The study setting was 11 teaching hospitals. Findings showed that the confused educational system was the main concern of the residents' experience of the teaching and learning process in the operating room. This concern is investigated by dividing into four subcategories: Education in the shadow of treatment, inefficient education, patient safety versus trusting residents for independent practice, and unstructured assessment.

Based on residents' experience about challenges such as inefficient education, the influence of patient safety versus trusting residents for independent practice, and unstructured assessment, the surgical residents' education in the operating rooms needs to revise.(16)

There is qualitative study was conducted on factors affecting surgical skill in 2019-2020 in Iran using the conventional content analysis method. Participants were selected using purposive sampling. Data were collected through 25 semi-structured in-depth interviews.

The data were classified into two main categories, namely challenges/obstacles and strategies for dealing with the challenges. The data in the first category were further classified into four subcategories, including burnout, confusion in technique selection, unequal learning opportunities, ignorance, and responsibility misassignment. Similarly, four subcategories of establishing communication channels with chief residents and faculty members, learning by the non-surgeon pathway, covert progress in the learning path, and taking advantage of force from a position of power in the learning path were considered for the second category.

Based on the findings of the study, the lack of a structured training program and dominance of the senior/junior system cause the surgical residents to face serious challenges and obstacles in their training course. This situation sometimes threatens their physical and mental health. However, over time they develop strategies such as establishing communication channels to get through this course, even if they fail to acquire the necessary skills. Therefore, the researchers suggest that authorities in charge of developing the surgical education system take serious steps to improve the curriculum of the surgical course and monitor the systematic implementation of these changes.

In systematic review that was done on gender differences in the acquisition of surgical skills shows significant difference. The studies were qualitatively synthesized in five categories studies on medical students, studies on both medical students and residents, studies on residents, studies on gender differences in needed physical strength, and studies on other gender-related training conditions). Male medical students tended to outperform females, while no gender differences

were found among residents. Gaming experience and interest in surgery correlated with better acquisition of surgical skills, regardless of gender. Although initial levels of surgical abilities seemed lower among females, one-on-one training and instructor feedback worked better on females and were able to help the acquisition of surgical skills at a level that negated measurable gender differences. Female physicians possess the required physical strength for surgical procedures, but may face gender-related challenges in daily clinical practice. Medical students are a heterogeneous group with a range of interests and experiences, while surgical residents are more homogeneous perhaps due to selection bias. Gender-related differences are more pronounced among medical students. Future surgical curricula should consider tailoring personalized programs that accommodate more mentoring and one-on-one training for female physicians while giving male physicians more practice opportunities in order to increase the output of surgical training and acquisition of surgical skills.

4. Objective of the study

4.1. General objectives

To assess the challenges in acquiring surgical skill among surgical residents in Addis Ababa University in Addis Ababa, Ethiopia, 2024.

4.2. Specific objectives

To find out if there is any standard assessment in surgical skill acquisition among surgical residents which is practiced by all instructors

To determine factors negatively affecting acquiring adequate surgical skill during surgical residency training

To propose possible solution to address the challenges

5. Method and Material

5.1 Study area

Addis Ababa University is found in Addis Ababa and gives its medical training in Tikur Anbessa specialized Hospital as primary institutions also in other affiliated Hospitals like Zewditu Memorial, Menelik specialized and St Peter Specialized Hospital. Tikur Anbessa specialized hospital is found in Addis Ababa city Kirkos sub city which is a tertiary referral hospital. The hospital sees approximately 400,000 patients per year in OPD but its exact number is unknown. In Addis Ababa University the School of Medicine (SoM, previously called Faculty of Medicine) was established in 1964 with the goal of producing medical doctors to shoulder responsibilities of solving the country's health problems. Starting from 1979, the School launched graduate programs for the first time in Addis Ababa University. This is the largest teaching Hospital for Addis Ababa University. It trains surgical residents and fellows in different specialities and subspecialties.

5.2. Study design and Period

A single institution cross sectional study design will be conducted from June-November, 2024.

5.3. Population

5.3.1. Source population

All surgical residents being trained in AAU

5.3.2 The study population

All surgical residents being trained in AAU, who are 2nd year and more.

5.4. Inclusion and Exclusion criteria

5.4.1. Inclusion criteria

The study includes all surgical residents in all surgical units who are 2nd year or more and actively working for the last 6 months

5.4.2. Exclusion criteria

The residents who previously worked in AAU, currently absent due to monthly leave, illness or maternity leave during data collection.

5.5 Sample size determination

Since we choose Census method sample size is 92.

4.6 Sampling method

The sampling method is census so includes all surgical residents in AAU. Since the number is less than hundred and manageable we selected this and also it avoids sampling bias.

5.7 Data collection tools and procedures

Structured questioner will be developed for this study to collect data on difficulties in acquiring surgical skill among surgical residents. The questioner included socio demographic information, economic and institutional factor. The first part includes socio demographic data of residents. It includes age, sex, marital status, year of residency and surgery unit. Factors that burnout the residents like High work pressure, imposition of irrelevant and humiliating roles, and assuming responsibility. Economic factors leading to do another job. Unequal learning opportunities like dominance of relationships over criteria, conflict of opportunity and threat due to the presence of fellowships and gender discrimination. Neglect and disregard by mostly recruiting residents as an aid to finish procedure and also neglecting as never been seen. The questioner is evaluated and tasted by 10 % of sample size and re arranged

5.8. Study variables

5.8.1. Dependent variables

Surgical skill acquisition and residents satisfaction

5.8.1. Independent variable

Demographic factor

Age

Sex

Marital status

Years of residency

Surgical unit

Socio-economic factor

Resident factors

Institutional factors

5.9 Operational definition

surgical skill to your level according to the curriculum

In each there is surgical skill to be acquired to each year of residency so it is compared with it.

burnout because of high work load

High working pressure, imposition of irrelevant and humiliating roles, unnecessary physical presence, and assuming responsibility are included

unequal learning opportunities

Unequal involvement in surgical procedures due to any preference or discrimination in instructor or senior resident

5.10 Data quality assurance

All questions are rationally connected to the variable being measures as well as to the overall study goals, in order to increase validity. Pre testing of 10% of the questioners will assure the data quality. After the pre-test, the questionnaire will be corrected if they are too ambiguous or unclear, then daily editing and cleaning the acquired data will begin. In addition to avoid information response bias will be informed about the purpose of the study. At the end of each data collection day, the entire questionnaire will be reviewed for legibility and completeness. Incomplete and illegible response will be discarded.

5.11 Data Analysis

Data management and analysis for the quantitative, data will be entered , checked and coded into Epi Data version 4.6 and exported to SPSS version 26 for analysis. Descriptive statistics such as mean , frequency and percentage were computed and presented by using text, tables and graphs.

5.12 Ethical consideration

The present research is based on the results of a doctoral dissertation approved by the Research and Ethical Committee of Department of Surgery with DOS/REU/128/2024/ moral license number. With respect to principles of research ethics, all research participants gave their consent; they were assured their data would be kept confidential. They were also assured that they were authorized to refrain from participation at any stage of the research process.

5.13 Dissemination of findings

The result of the study will be disseminated to selected college management, AAU and for any other stakeholders. Additionally, the finding will be shared through national and international peer reviewed journal

6. Result

There were 55 participants in the study that was included in this research from five surgical unit including General surgery, Pediatric surgery, Neurosurgery, Plastic surgery and Urology. Our initial plan was to involve but due to change in number of residents during data collection the number drops to this level

Gender Distribution: This study involves both Genders. Maximum numbers of Residents were Male 39(70.9%). The numbers of female residents were 16(29.1%)

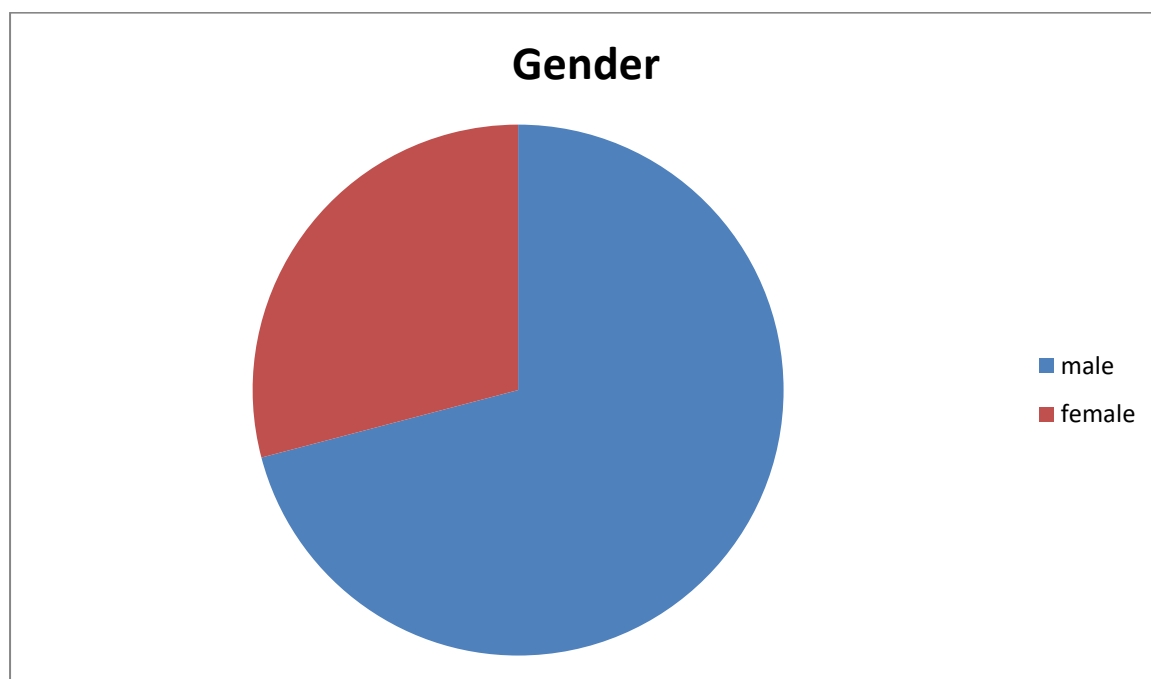


Figure 1 The pie chart shows distribution of residents in terms of Gender

Age Distribution: Most residents age lie between 25-30 years (76.4%) followed by 31-35 years (20%), above 35(1.8%) and 21-25 years(1.8%).

Table 1 :Age distribution of surgical residents(years)(n=55)

Age category	Frequency	Percent
20-25	1	1.8

26-30	42	76.4
31-35	11	20
Above 35	1	1.8
Total	55	100

Marital status: Maximum number of surgical Residents are single 39 (70.9%) followed by Married 16(29.1). There is no divorced or widow identified.

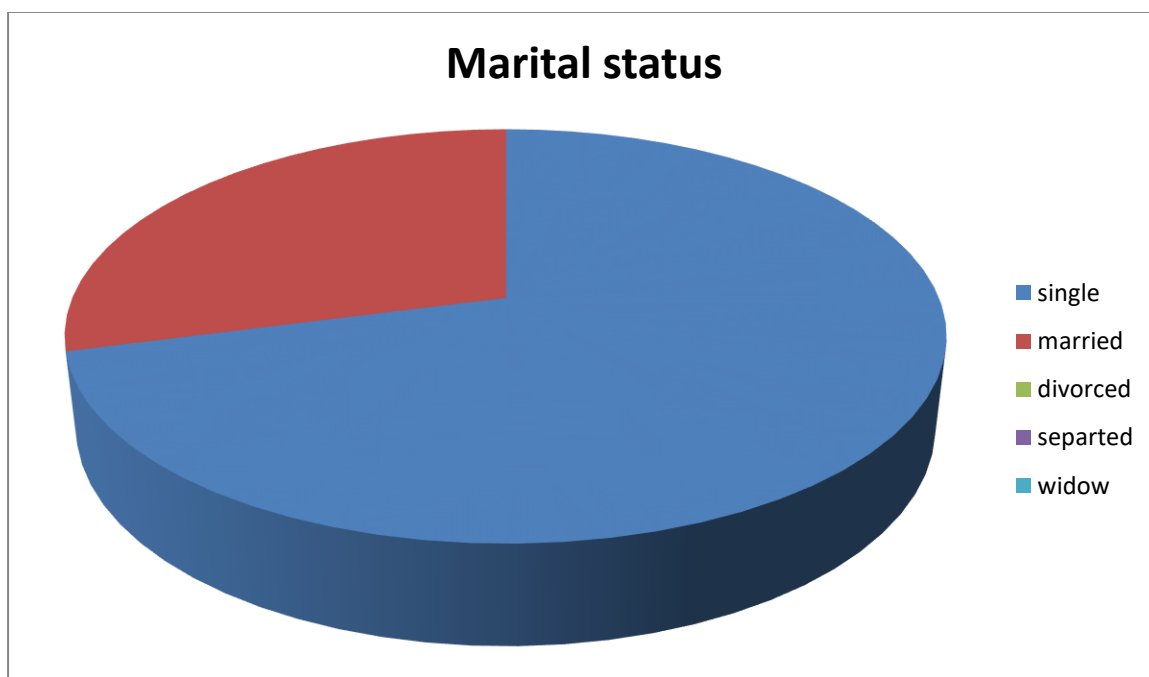


Figure 2: The pie chart shows distribution of surgical residents in marital status

Surgical Unit: Twenty eight (50.9%) of them are from General surgery, six (10.9) pediatric surgery, Nine plastic surgery (16.3), Nine Urology (16.3) and three of them were from Neurosurgery (5.5%).

Table 2: surgical unit distribution of residents (n=55)

Surgical unit	frequency	Percent
---------------	-----------	---------

General surgery	28	50.9
Pediatric surgery	6	10.9
Plastic surgery	9	16.3
Neurosurgery	3	5.5
Urology	9	16.3
Total	55	100

Year of residency: Sixteen (30.9%) of them were in the second year, fourteen (25.5%) in the third year, eighteen (34.5%) in the fourth year and six (9.1%) in the fifth year.

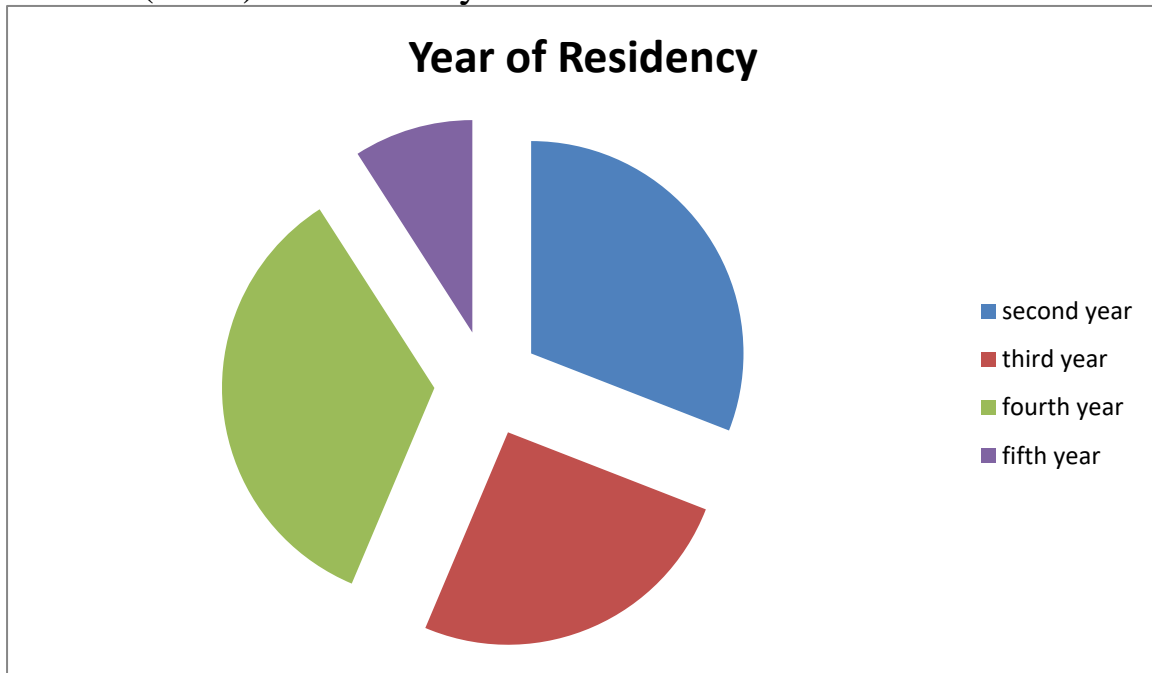


Figure 3: distribution of year of residency of surgical resident

Acquisition of surgical skill: Maximum number of residents about 37(67.3%) stated they are not satisfied with their surgical skill acquisition level to their level of residency but the other about 18(32.7%) stated their surgical skill is comparable to their year of residency according to curriculum and they are satisfied with it. From the second and third year residents about 77.6% stated they were not

satisfied with their surgical skill acquisition level to their level of residency. When we see year four and five residents it is about 60.2%. Based on the surgical unit the surgical skill acquisition satisfaction is better in Urology (56%) followed by General (34%) and plastic surgery (33%) and it is the list in paediatric surgery (13%) and Neurosurgery. When we compare based on gender about 75 % of female stated they were not satisfied with their surgical skill acquisition level comparing to their level but it is lower in male 39%.

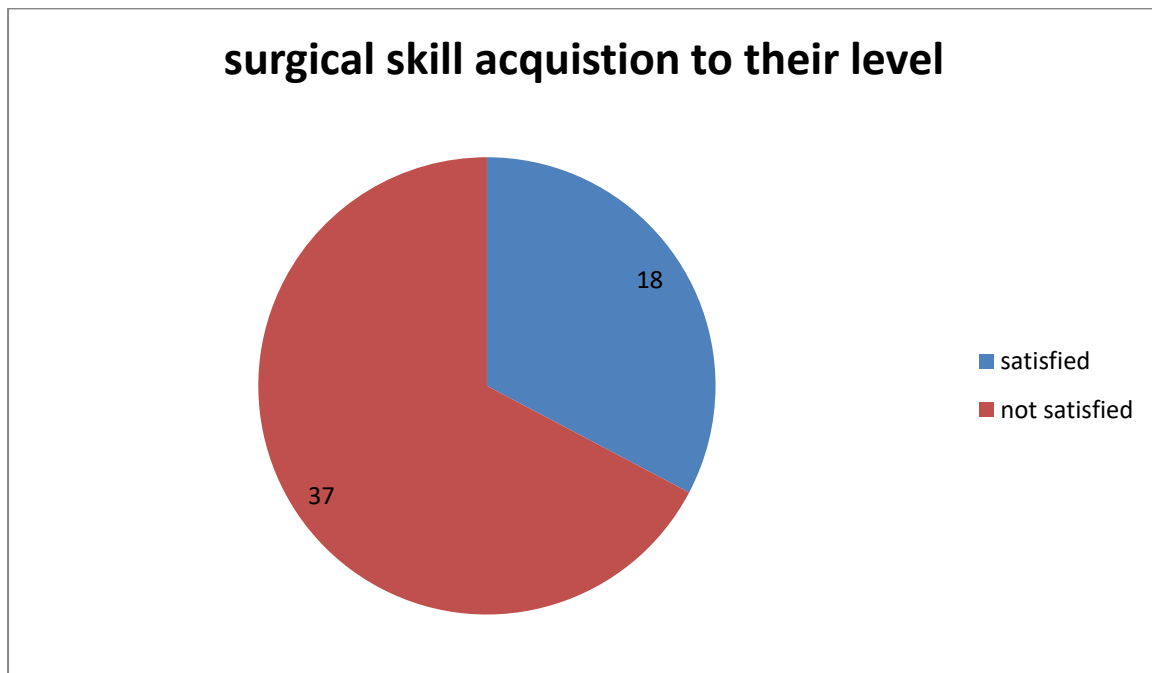


Figure 4: satisfaction of surgical residents in acquiring surgical skill to their level

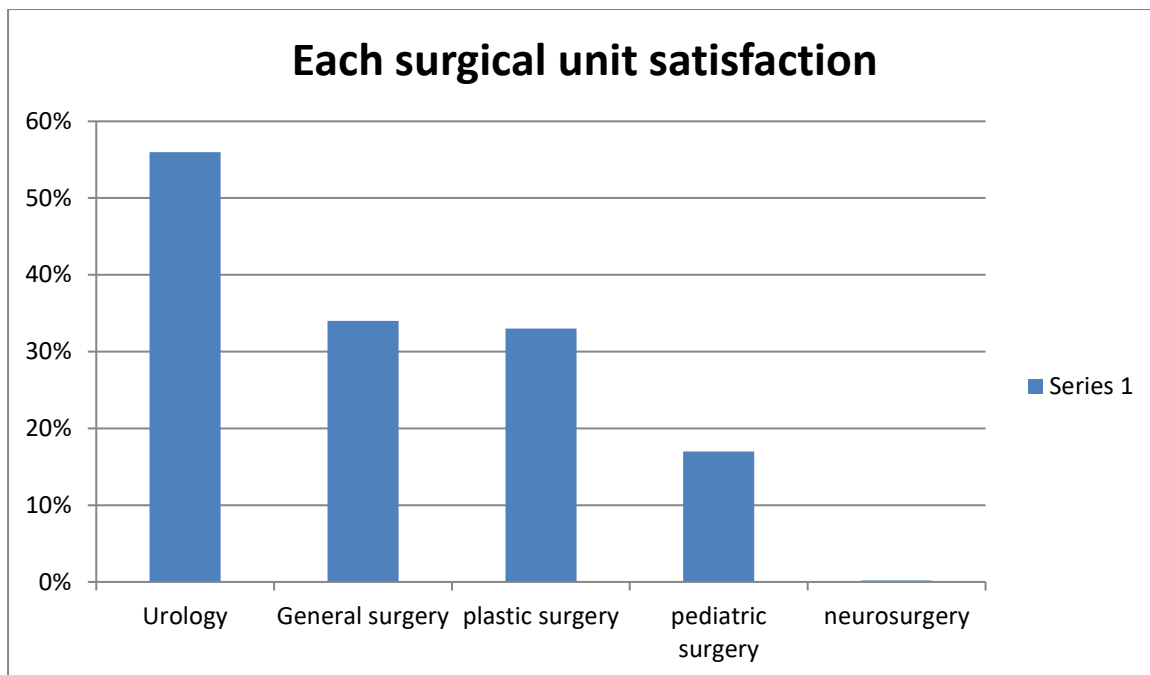


Figure 5 :satisfaction of surgical residents in acquiring surgical skill to their level of each unit

Challenges

Four subcategories including burnout, unequal learning opportunities, neglect and disregard, and responsibility misassignment constituted this main category.

Burnout

High working pressure, imposition of irrelevant and humiliating roles, unnecessary physical presence, and assuming responsibility are primary codes in this subcategory. About 49(89.1%) of residents they have been burned out due to work load. The heavy workload imposed on residents, especially in the first and second years (97.2%), leads to extreme fatigue and burnout.

In addition to excessive workload, the other thing that was assessed on this research is if there is assuming unrelated and humiliating tasks and the obligation to perform. About 38(87.3 %) of residents agree there is such humiliating role that affected their time and exposure to surgical procedures. When we compare with first and second year experience (87.4%) it is almost the same.

Unnecessary physical presence was one of the issues that was assessed on this research. Sometimes, despite the lack of assigned tasks for residents, they are not allowed to leave the hospital or even the operating room simply because other residents have not completed the operation. On this assessment about 47(85.4%) agree there is such unnecessary physical presence. When we compare with first and second year experience (97.4%).

As the level of education of the residents' increases, the physical burden decreases, but their responsibilities are added, and this is also a serious challenge to them. About 33(60%) agree there is additional burden from the department like coordinate manage and educate

juniors 13(23.6%) were neutral about it and 10(16.4%) disagree.

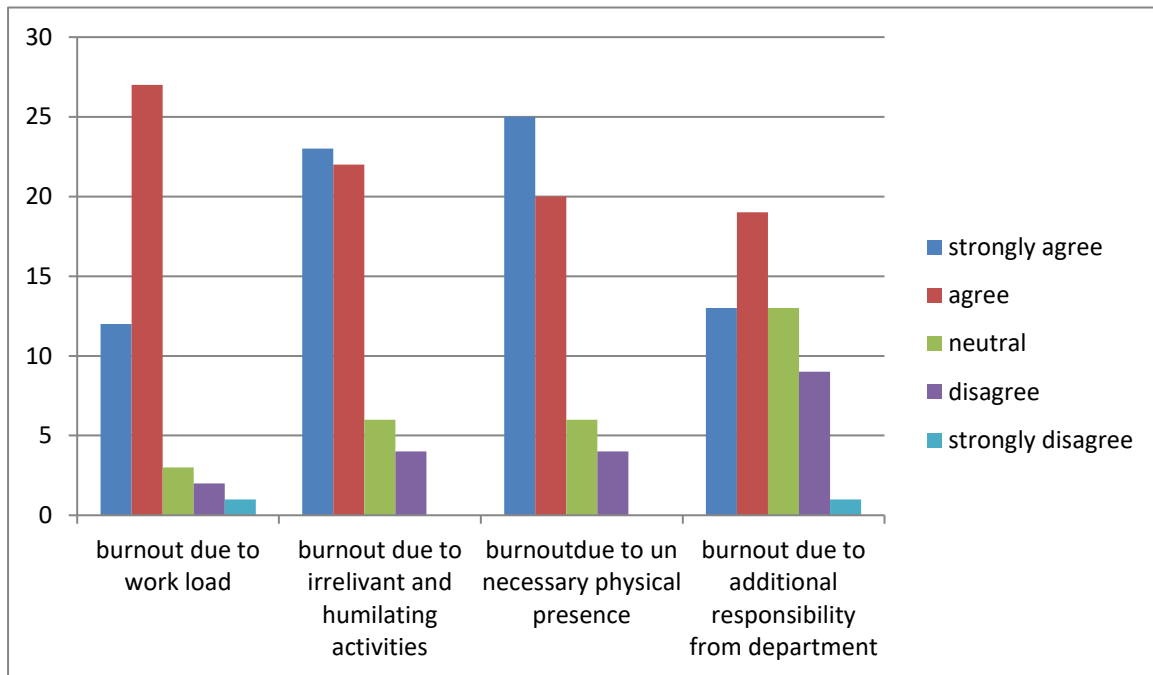


Figure 6: The bar chart shows causes of burnout and their level of effect on residents

Unequal learning opportunities

Learning opportunities, influenced by various factors, are not distributed equally. These factors are the dominance of relationships over criteria, incompatibility of the assistant to a patient in difficult surgical procedures, conflict of opportunity and threat due to the presence of fellowships, and gender discrimination.

Due to the lack of a structured educational system for residency training, relationships are very influential in the training process of residents and repeatedly affect learning opportunities. On our research about 31(56.3%) stated there is unequal learning opportunity due to dominance of relationship the other 15(27.2%) and 9(16.3%) are neutral and disagree on this subject respectively.

The presence of advanced surgeries & laparoscopic procedures has also led to a decrease in exposure residents for, although their passion for teaching laparoscopic surgery principles advanced surgeries is a great opportunity. On our research about 32 (58.1%) agree there are such difficulties but about 15(27.2%) neutral and other 8(14.2%) disagree. When we see this is on second and third year experience it is higher (61%). About 47(85%) of residents stated there is difficulty of exposure to surgical case due to the starting of fellowship program.

In addition to the same problems as male residents, female residents disclosed the serious challenge of gender discrimination and ignorance of them by the educator in the operating room. On our research 12(21.8%) there is such discrimination but still about 28(50.9) disagree with that and 15(27.2%) are neutral on this subject. From females about 4(25%) only agree with this.

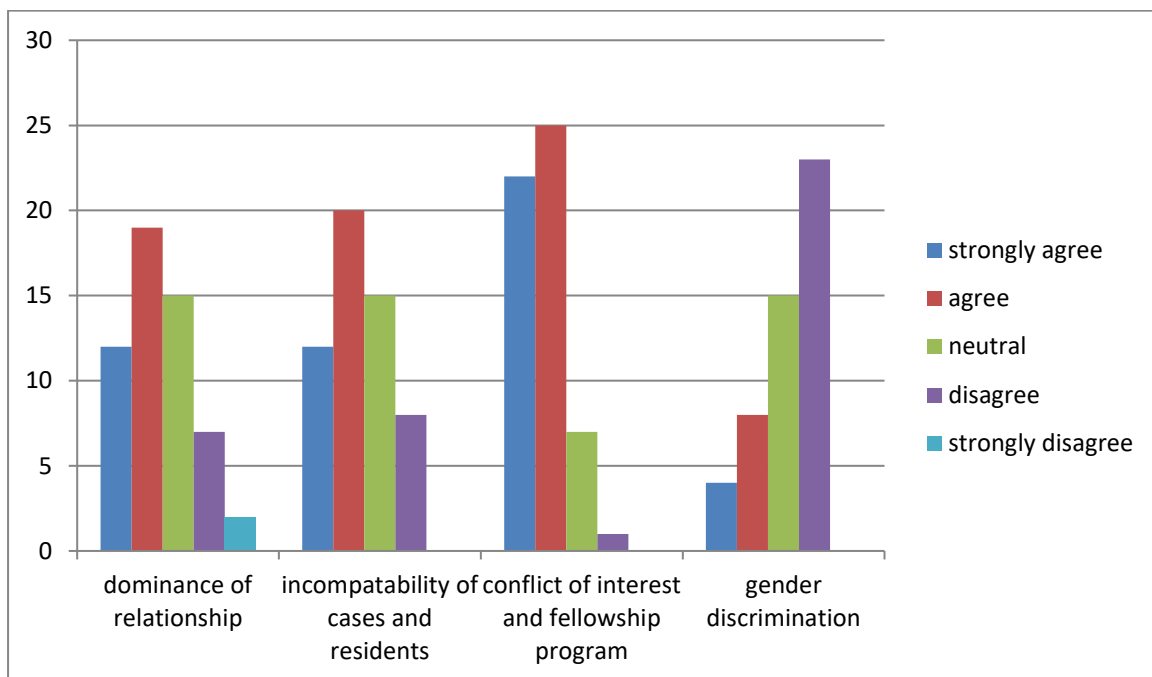


Figure 7: The Bar graph shows distribution of causes of unequal learning opportunity

Economic challenges are one of the factors affecting surgical residency training program. In our research about 47(85%) stated the economic constraints are affecting their study time and mental

stability. Of this 47 about 35% forced to do other Job. Of doing additional Job Forty three percent of them are married and 57 % are single.

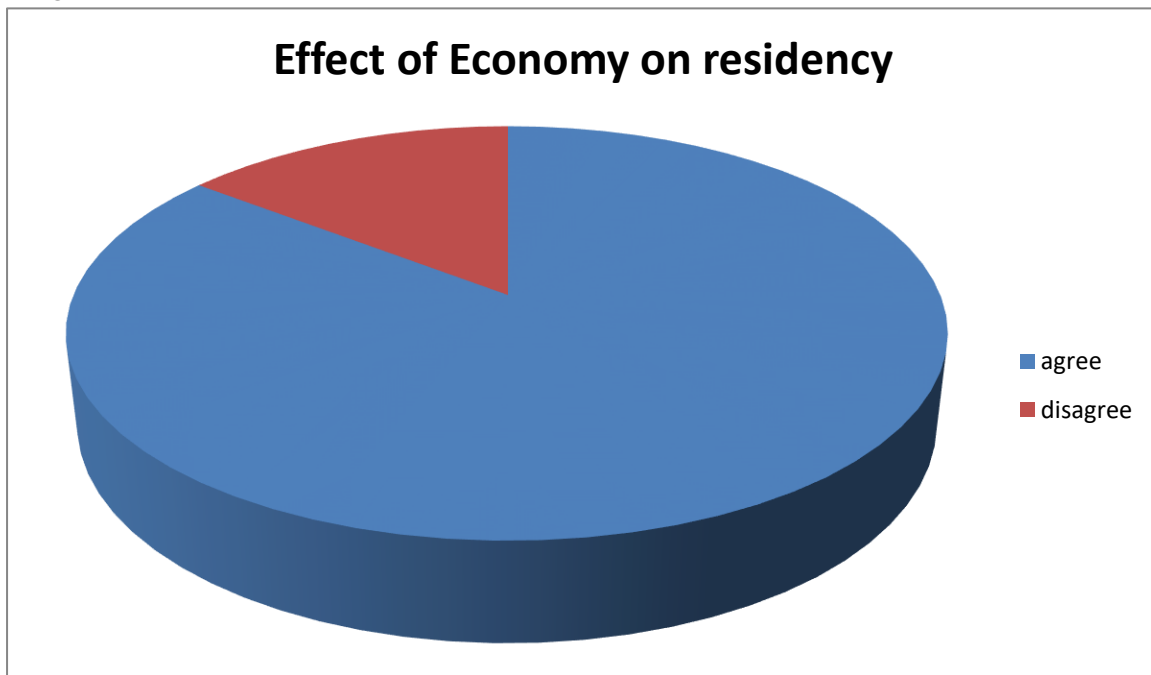


Figure 8: effect of economic status on surgical residency

Residents stated that they had been denied the right to choose to do main procedure and were mostly recruited as aids to finish operations, disregarding the correspondence between the type of operation and student's level and purposes of education. About 24 (41%) complained they are being treated this way but the other 19(34.5%)

disagree and 13(23.6%) are neutral about it.

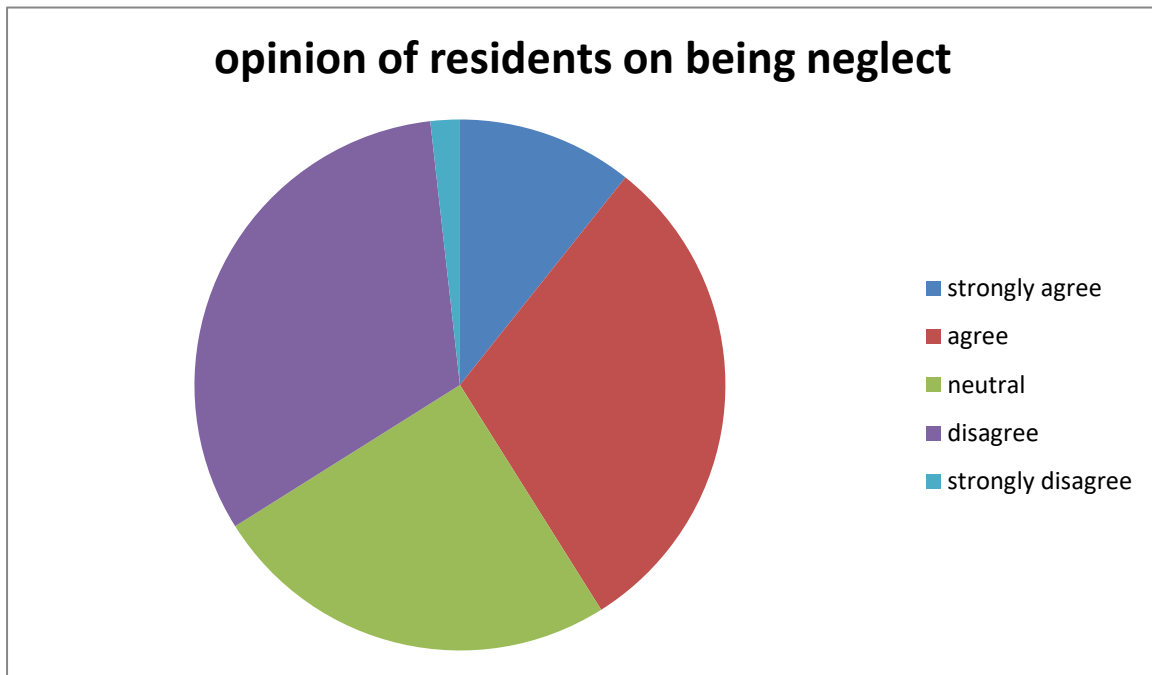


Figure 9: the pie chart show opinion of surgical residents on being neglected in Operation Theater

One of the factor that we assess on our research is effect of adequacy of surgical material in surgical practice and exposure and about 36(65.4%) of residents stated the surgical materials like skill lab materials and materials for procedure are inadequate and it limits surgical practice.

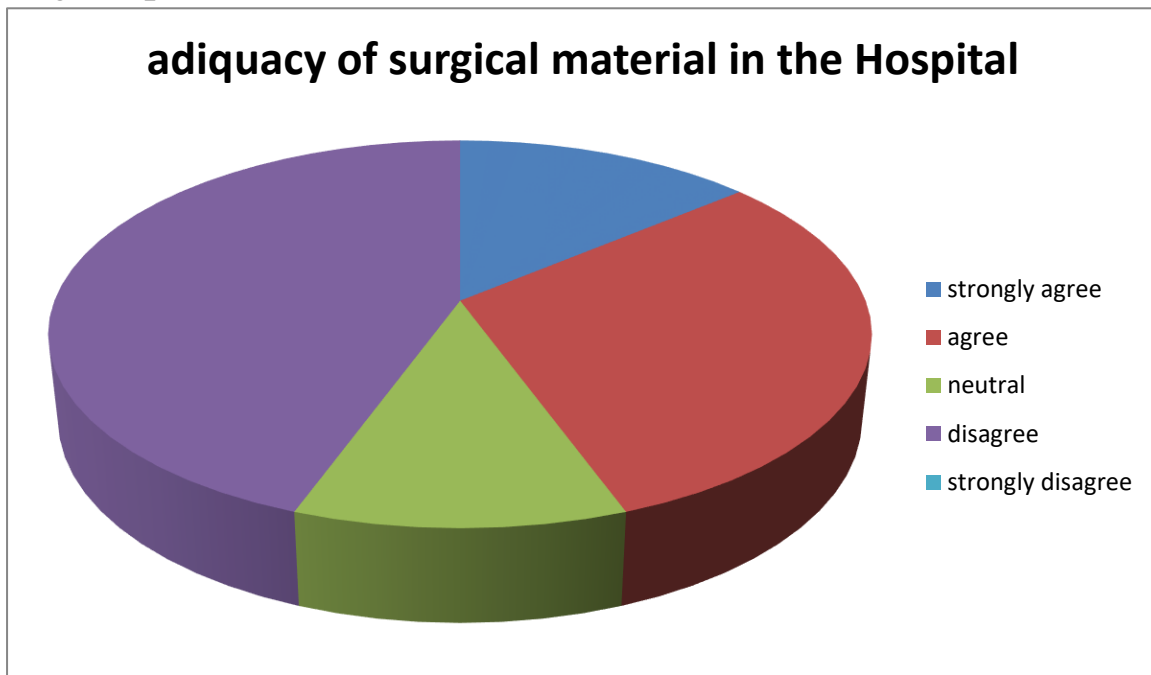


Figure 10: The pie chart shows surgical residents opinion on adequacy of surgical instruments in Hospital

During surgical residency one of the factors affecting stay and practice there is relationship with the staff like nurses anesthetics and other paramedics. On our research 25(45.5) replied the staffs are not cooperative during their practice.

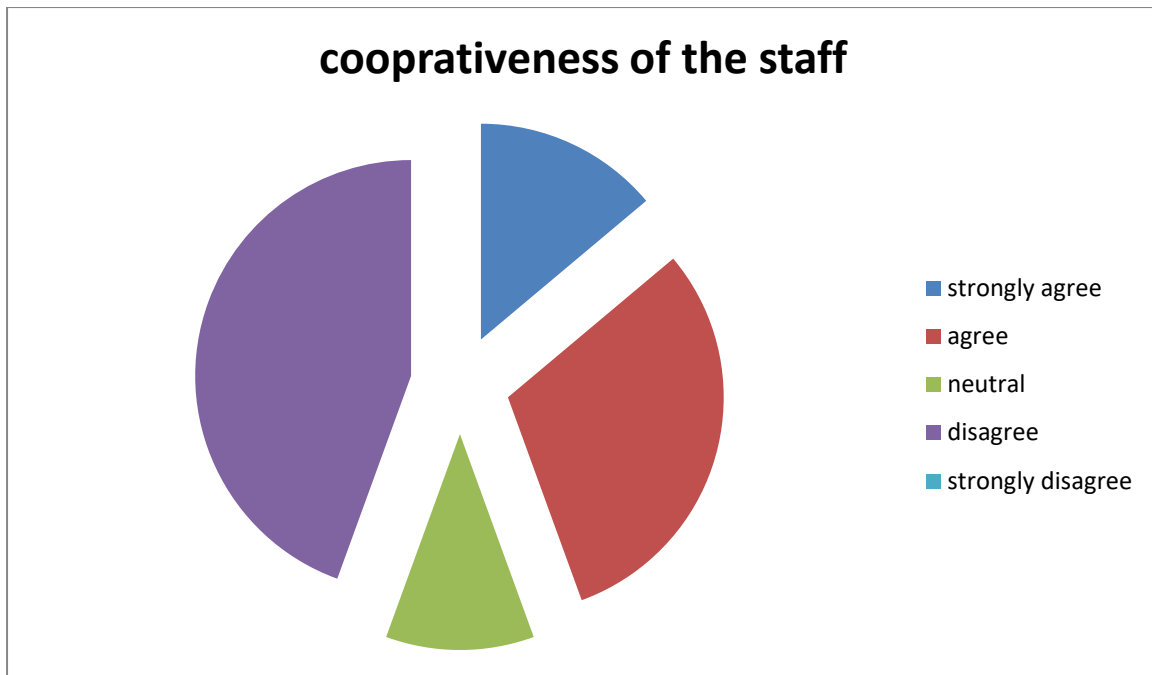


Figure 11: The pie chart shows resident opinion on cooperativeness of staff

After surgical procedures exposure and experience a standardized assessment method to evaluate level of surgical skill acquisition and standardized feedback mechanism is necessary. On our research participants about 50(90.9%) stated there is no standardized assessment method to evaluate your level of surgical skill and also about 51(92.7%) stated there is no standardized feedback system for your skill. Those things affect their practice.

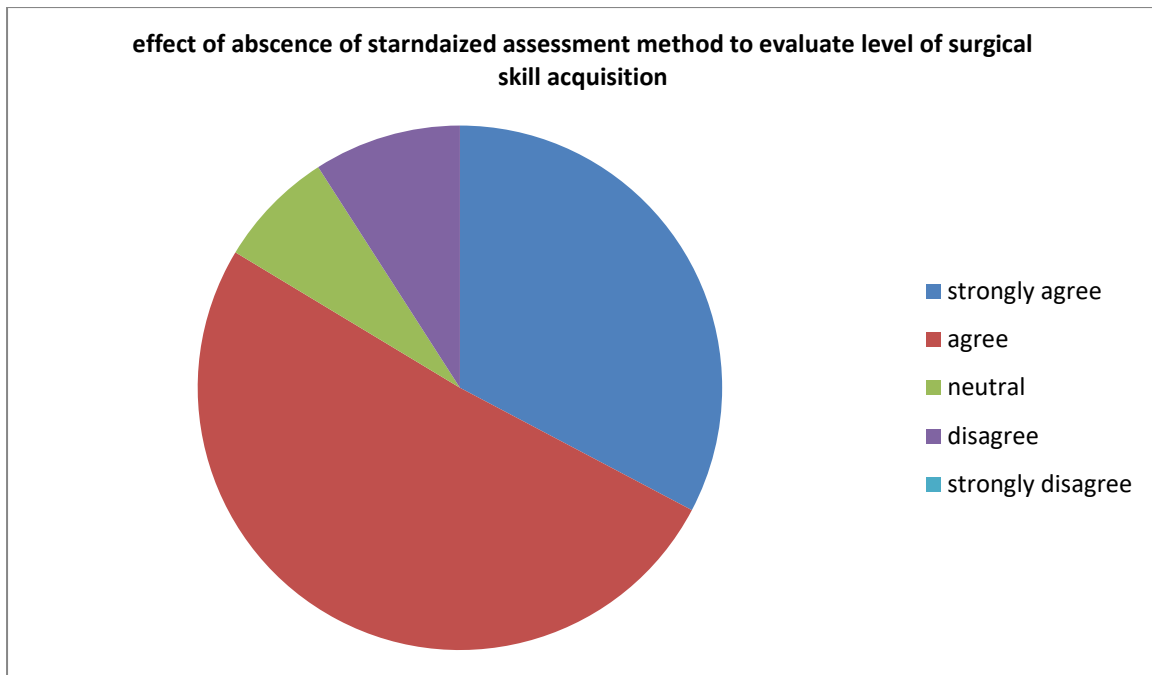


Figure 12: the pie chart shows residents opinion on effect of absence of standard assessment method to evaluate level of surgical skill acquisition

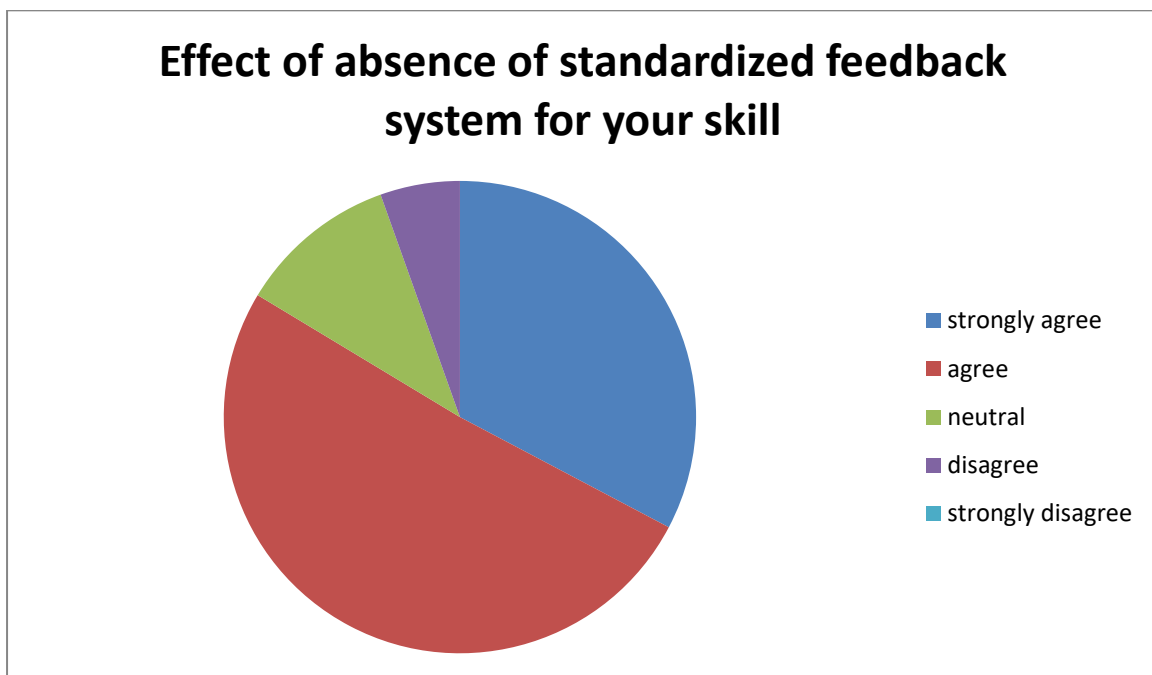


Figure 13: the pie chart shows effect of absence of standardized feedback system for your skill

Bivariant Analysis

Table 3:association of variables and residents satisfaction in their surgical skill

	Variables	B	S.E	Wald	df	sig	Exp(B)
Demography	Sex	-.519	.667	.605	1	.437	.595
	Age category	.949	.670	2.006	1	.157	2.583
	Marital Status(1)	-1.583	.823	3.699	1	.054	.205
	Surgical Unit			2.504	4	.644	
	Year of Residency(1)	-.511	1.238	.170	1	.680	.600
Burnout	Do you think your training is affected by due to burnout because of high work load.	-1.067	.484	4.848	1	.028	.344
	Do you think your training is affected by due to burnout because of unnecessary physical presence	-.724	.394	3.373	1	.066	.485
	Do you think your training is affected by due to burnout because of additional responsibility in the department.	-.674	.400	2.845	1	.092	.510
economic	Is your surgical training affected by	-.247	.795	.097	1	.756	.781

	your economic status						
	Do you do other job other than the training	-.095	.637	.022	1	.881	.909
Unequal learning opportunity	Do you think there is unequal learning opportunities based on dominance of relationships over criteria	-.936	.435	4.632	1	.031	.392
	Do you think there is unequal learning opportunities due to incompatibility of the cases type and residents	-1.011	.444	5.189	1	.023	.364
	Do you think there is unequal learning opportunities based on conflict of opportunity and threat due to the presence of fellowships	-.041	.403	.011	1	.918	.960
	Do you think there is unequal learning opportunities	-.620	.589	1.108	1	.293	.538

	based on gender discrimination.						
	Do you think you are being neglected and mostly recruited as an aid to finish procedure	-1.110	.423	6.871	1	.009	.330
	Do you think you are being neglected as never been seen.	-.945	.521	3.286	1	.070	.389
	Do you think there is adequate material and set up to study and operate	-.662	.533	1.541	1	.215	.516
	Do you think the staff in the institutions are cooperative	.718	.542	1.754	1	.185	2.050
	Is there standard assessment method to evaluate your level surgical skill acquisition	1.253	.964	1.690	1	.194	3.500
	If your answer for the question on number 21 is no Do you think it really affected your	-1.139	.479	5.647	1	.017	.320

	surgical skill acquisition?						
	Is there standard feedback mechanism for your surgical practice skill	-1.405	1.192	.116	1	.734	.667
	If your answer for the question on number 23 is no Do you think it really affected your surgical skill acquisition?	-1.139	.479	5.647	1	.017	.320

7. Discussion

The present qualitative study was conducted in 2024 to explain the experiences of surgical residents during surgical residency. We categorize challenges and analyzed them. The main category of the challenges included burnout, unequal learning opportunities, neglect and disregard, and responsibility misassignment subcategories. Occupational burnout consisted of primary codes, including enduring the high and low-quality workload of juniors, imposing humiliating roles, and burnout. One issue that all residents agree on is burnout due to high workload. Based on other studies, job burnout is a syndrome of emotional fatigue and characterization that decreases the effectiveness of the workplace and should be managed. (17) The incompatibility of the assistance with the patient and educational goals and creation of a competitive environment have confronted the residents with serious challenges in acquiring surgical skills. Along with these results, Bradley believes that a structured curriculum should be designed to achieve educational goals, given the reduction in students' learning opportunities following the decline in situations for gaining experience(18)The other thing we assess was teaching method most. residents stated there is no standardized assessment method to evaluate their level of surgical skill acquisition and also there is no standard feedback mechanism for their skill so they cannot be sure about here skill. According to the results, residents did not have the right to select and were often marginalized, thus missing the learning opportunities. While confirming the prevailing atmosphere of intimidation and harassment in the training system of surgical residents, they

stated that according to their study, during the residency course, more than 70% of surgical residents in Canada were harassed by senior residents with various means, including rejection and insult (19). Economic factors also the other challenge they face, It loads additional burden and made them unstable and unable to concentrate on their residency. Institutional factors like absence of surgical material and also uncooperativeness of staff was challenging.

8. Conclusion

Surgical residents at Addis Ababa University face multifaceted challenges in acquiring surgical skills, including burnout, inequities, and insufficient institutional support. Interventions to standardize assessments, provide equitable opportunities, and enhance institutional support systems are essential to improve the training experience and skill acquisition for surgical residents. Our recommendation is to decrease burnout of residents by decrease burden by distributing responsibilities to responsible staff. Surgical cases also should be distributed fairly to each resident. There should be adequate surgical material and rooms where any resident can go any time and practice surgical skill. There should be standardized evaluation and feedback mechanism on each surgeries this will improve surgical skill.

9. Limitation

The study relies on self-reported data from residents, which may introduce bias due to subjective perceptions, over reporting, or underreporting of difficulties. The study is restricted to surgical

residents at Addis Ababa University and inter surgical units participant ratio is no the same, which may limit the generalizability of findings to other institutions or regions. Residents who chose not to participate might have different experiences or perspectives, which could skew the findings. The study did not include objective measures of surgical skill acquisition (e.g., performance metrics), relying instead on subjective feedback from residents.

10. Reference

1. Appelbaum NP, Lee N, Amendola M, Dodson K, Kaplan B. Surgical Resident Burnout and Job Satisfaction: The Role of Workplace Climate and Perceived Support. *J Surg Res.* 2019;234:20-5.
2. Drossard S. Structured surgical residency training in Germany: an overview of existing training programs in 10 surgical subspecialties. *Innov Surg Sci.* 2019;4(1):15-24.
3. Bell RH, Jr., Biester TW, Tabuenca A, Rhodes RS, Cofer JB, Britt LD, et al. Operative experience of residents in US general surgery programs: a gap between expectation and experience. *Ann Surg.* 2009;249(5):719-24.
4. Hurreiz H. The evolution of surgical training in the UK. *Adv Med Educ Pract.* 2019;10:163-8.
5. American college of surgeon. Statement on Harassment Bullying and Discrimination: ACS Women in Surgery Committee, with input from the ACS Committee on Diversity; 2019 [Available from: <https://www.facs.org/about-acs/statements/117-harassment>].
6. Leisy HB, Ahmad M. Altering workplace attitudes for resident education (A.W.A.R.E.): discovering solutions for medical resident bullying through literature review. *BMC Med Educ.* 2016;16:127.
7. Hashimoto DA, Bynum WEt, Lillemoe KD, Sachdeva AK. See More, Do More, Teach More: Surgical Resident Autonomy and the Transition to Independent Practice. *Acad Med.* 2016;91(6):757-60.
8. Fayanju OM, Aggarwal R, Baucom RB, Ferrone CR, Massaro D, Terhune KP. Surgical Education and Health Care Reform: Defining the Role and Value of Trainees in an Evolving Medical Landscape. *Ann Surg.* 2017;265(3):459-60.
9. Sachdeva AK. Acquiring and maintaining lifelong expertise in surgery. *Surgery.* 2020;167(5):787-92.

10. DaRosa DA, Zwischenberger JB, Meyerson SL, George BC, Teitelbaum EN, Soper NJ, et al. A theory-based model for teaching and assessing residents in the operating room. *J Surg Educ.* 2013;70(1):24-30.
11. Roberts NK, Williams RG, Kim MJ, Dunnington GL. The briefing, intraoperative teaching, debriefing model for teaching in the operating room. *J Am Coll Surg.* 2009;208(2):299-303.
12. Martin JA, Regehr G, Reznick R, MacRae H, Murnaghan J, Hutchison C, et al. Objective structured assessment of technical skill (OSATS) for surgical residents. *Br J Surg.* 1997;84(2):273-8.
13. Gofton WT, Dudek NL, Wood TJ, Balaa F, Hamstra SJ. The Ottawa Surgical Competency Operating Room Evaluation (O-SCORE): a tool to assess surgical competence. *Acad Med.* 2012;87(10):1401-7.
14. Kotsis SV, Chung KC. Application of the "see one, do one, teach one" concept in surgical training. *Plast Reconstr Surg.* 2013;131(5):1194-201.
15. Bould MD, Sutherland S, Sydor DT, Naik V, Friedman Z. Residents' reluctance to challenge negative hierarchy in the operating room: a qualitative study. *Can J Anaesth.* 2015;62(6):576-86.
16. Sadati L, Yazdani S, Heidarpoor P. Surgical residents' challenges with the acquisition of surgical skills in operating rooms: A qualitative study. *J Adv Med Educ Prof.* 2021;9(1):34-43.
17. Shanafelt TD, Balch CM, Bechamps G, Russell T, Dyrbye L, Satele D, et al. Burnout and medical errors among American surgeons. *Ann Surg.* 2010;251(6):995-1000.
18. Champagne BJ. Effective teaching and feedback strategies in the or and beyond. *Clin Colon Rectal Surg.* 2013;26(4):244-9.
19. Karim S, Duchcherer M. Intimidation and harassment in residency: a review of the literature and results of the 2012 Canadian Association of Interns and Residents National Survey. *Can Med Educ J.* 2014;5(1):e50-7.

11. Annex

11.1 consent from

Hello , My name is

From Tikur Anbassa specialized Hospital. I conduct study to assess difficulties in acquiring surgical skill among surgical residents. The purpose of this study is to gather information on the difficulties that residents faces in acquiring surgical skill during there residency.

I need your permission to talk to you about your opinion, thought and experience about those difficulties you face during your stay. Whether you choose to participate or not, you will not be asked to pay or receive any kind of payment. You are not required to participate, and you are free to choose not to answer any question. We will keep what ever you say private. I want to reassure you that taking part in the study will not have an impact on your residency.

If you have any question you can ask me any time. Your name will not be used in any report but your ideas and suggestion will help us to attain our objective.

Thank you for your time

Are you willing to participate in this study put (x) mark on your answer

Yes ___ No

If yes signature

General instruction

- no need to write your name

- in all cases where answer options are available please (x) in the box provided

-for blank space provided write the answer over there

Thanks in advance for your honest cooperation

11.2 questionnaires for residents

The first part of survey is designed to obtain basic background and demographic information. As well as aspect of your level of residency and unit you are attending . please respond to each question by writing your answer in the space provided.

Part 1 Demographic information

No	Question	Coding categories
1	Sex	A)Male B)Female
2	Age in year	A) 20-25 B)25-30 B) 31-35 C)> 35
3	Marital status	A)Single B)Married C)Divorced D)Widowed E)Separated

4	Surgical unit	A)general surgery B)Pediatric surgery C)Neurosurgery D)Plastic surgery E)urology
5	Year of residency	A)2nd year B)3rd year C)4th year D)5th year

On the questions below mark your level of agreement of disagreement

6	Do you think you are trained in surgical skill to your level according to the curriculum	A)Yes B)No
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No	Question	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
7	Do you think your training is affected by due to burnout because of high work load.					
8	Do you think your training is affected by due to burnout because of imposition of irrelevant and humiliating roles					
9	Do you think your training is affected by due to burnout because of unnecessary physical presence					
10	Do you think your training is affected by due to burnout because of additional responsibility in the department.					

11	Is your surgical training affected by your economic status	A)Yes B)No
12	Do you do other job other than the training	A)yes B)No

13	Do you think there is unequal learning opportunities based on dominance of relationships over criteria					
14	Do you think there is unequal learning opportunities due to incompatibility of the cases type and residents					
15	Do you think there is unequal learning opportunities based on conflict of opportunity and threat due to the presence of fellowships					
16	Do you think there is unequal learning opportunities based on gender discrimination.					
17	Do you think you are being neglected and mostly recruited as an aid to finish procedure					
18	Do you think you are being neglected as never been seen.					

Institutional factor

19	Do you think there is adequate material and set up to study and operate					
20	Do you think the staff in the institutions are cooperative					

Teaching method

21	Is there standard assessment method to evaluate your level surgical skill acquisition	a) Yes b) No				
22	If your answer for the question on number 21 is no Do you think it really affected your surgical skill acquisition?					

23	Is there standard feedback mechanism for your surgical practice skill	a) Yes b) No				
24	If your answer for the question on number 23 is no Do you think it really affected your surgical skill acquisition?					