

Original Research Article

Diagnostic Accuracy of ALVARADO Score VS RIPASA Score in the Diagnosis of Acute Appendicitis

Article History:

Name of Author:

Dr Tayyaba Manzoor¹, Dr Jamil Salamat Ullah², Dr Saima Jamal³, Dr Shah Zaman⁴, Dr Inam Ul Haq⁵, Dr Sana Jabeen⁶

Affiliation:

¹Postgraduate Resident, Department of Surgery, CMH, Malir, Pakistan

²Assistant Professor, General and Laparoscopic Surgery, CMH, Malir, Pakistan

³Senior Registrar, Department of Surgery, CMH, Khuzdar, Pakistan

⁴House Officer, CMH, Malir, Pakistan

⁵House Officer, CMH, Malir, Pakistan

⁶Resident Surgeon, PAF Base Sargodha, Pakistan

Corresponding Author:

Dr Tayyaba Manzoor

Received: 05-01-2026

Revised: 28-01-2026

Accepted: 09-02-2026

Published: 15-02-2026

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-Noncommercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Abstract: **Introduction:** Scoring systems are crucial in settings with little resources, such as Pakistan. These grading systems can be helpful for clinical diagnosis, timely transfer from primary care facilities, and surgical decision-making in situations when radiography is unclear or unavailable. Therefore, this study will compare RIPASA and Alvarado scores to identify which tool offers better diagnostic reliability specific to our clinical practice, reducing the risk of complications as well as negative appendectomies. **Study design:** Cross-sectional (validation) study. **Settings:** Department of Surgery, Combined Military Hospital, Malir, Karachi, Pakistan. **Methodology:** Total 186 patients who has lower abdomen discomfort for fewer than five days and is suspected of having acute appendicitis, underwent appendectomy as the primary procedure, and individuals aged 11 to 69 years of either gender were included. This study excluded patients who had a history of discomfort lasting longer than five days, were pregnant, had a right iliac fossa mass, experienced persistent recurring pain in the right iliac fossa, or had a history of pelvic inflammatory disease. The RIPASA score was determined following a thorough history, examination, and basic laboratory testing. The Alvarado Score was used to make a clinical diagnosis of suspected cases of acute appendicitis. Results were compared with histopathology report. **Results:** 93.50% RIPASA score sensitivity, 79.37% specificity, 89.84% PPV, 86.21% NPV, and 88.71% diagnostic accuracy were used to diagnose acute appendicitis. 89.43% Alvarado score sensitivity, 73.02% specificity, 86.61% PPV, 77.97% NPV, and 83.87% diagnostic accuracy were used to diagnose acute appendicitis. **Conclusion:** According to this study, the RIPASA scoring system is a straightforward, easy, highly sensitive, and accurate way to diagnose acute appendicitis compared to the Alvarado scoring system.

Keywords: Acute appendicitis, RIPASA score, sensitivity.

INTRODUCTION

Acute appendicitis (AA), an inflammation of the appendix, is caused by bacterial translocation as a result of appendiceal luminal obstruction and elevated intraluminal pressure of the appendiceal lumen.¹ It is among the world's most common surgical emergency.^{2,3} 7–12% of the overall population is affected over the course of their lives. The incidence is therefore between 1.5 and 1.9 per 1000.4

Acute appendicitis symptoms might mimic those of other illnesses if it is not identified promptly, which

makes problems like perforation more challenging. On the other hand, the negative appendectomy rate is roughly 10–15%.⁵ The use of diagnostic auxiliary tools, including signs and symptoms, clinical, laboratory, and radiographic exams, can help avoid the aforementioned outcomes.⁶ For acute appendicitis, computed tomography (CT) has a 94% sensitivity and a 95% specificity.⁷ However, the cost is high. Consequently, clinical scoring systems such as Tzanakis, RIPASA, Alvarado, and AIR score have recently demonstrated their usefulness.⁸ The Alvarado score increases the accuracy of diagnosing

acute appendicitis by using eight clinical factors. On the other hand, the appendicitis inflammatory response (AIR) score considers seven parameters, including C-reactive protein (CRP) and anorexia or nausea.⁸

Scoring systems are crucial in settings with little resources, such as Pakistan. These grading systems can be helpful for clinical diagnosis, timely transfer from primary care facilities, and surgical decision-making in situations when radiography is unclear or unavailable. Therefore, this study will compare RIPASA and Alvarado scores to identify which tool offers better diagnostic reliability specific to our clinical practice, reducing the risk of complications as well as negative appendectomies.

METHODOLOGY

From October 2, 2025, to January 1, 2026, this cross-sectional study was carried out in the Department of Surgery, Combined Military Hospital, Malir, Karachi, Pakistan. The project was approved ethically before it began. According to the Dr. Lin Naing sample size calculator, the total was 186 (169 plus 10%, or 17), with an extra 10% for possible dropouts. The sensitivity and specificity of the Alvarado scoring system were calculated to be 68.32% and 87.91%, respectively. A 50% prevalence of AA and a 10% margin of error were assumed. Any patient who has lower abdomen discomfort for fewer than five days and is suspected of having acute appendicitis, underwent appendectomy as the primary procedure, and individuals aged 11 to 69 years of either gender were included. This pain may or may not be followed by additional signs and symptoms as specified in the Alvarado/RIPASA rating systems. This study excluded patients who had a history of discomfort lasting longer than five days, were pregnant, had a right iliac fossa mass, experienced persistent recurring pain in the right iliac fossa, or had a history of pelvic inflammatory disease.

Demographics, signs, symptoms, and laboratory tests utilized by the Alvarado and RIPASA scoring systems will all be included in the questionnaire (Annex B).

A maximum of 10 points are awarded using the Alvarado scoring system (Annex C). Each of the following symptoms is given one point: rebound tenderness, elevated temperature, Blumberg sign, urge to vomit and emesis, loss of appetite, and pain migrating to the right iliac fossa. On the other hand, leukocytosis and soreness in the right iliac fossa are given two points. A possible diagnosis of acute appendicitis is suggested by an Alvarado score of 5–6, a high chance is indicated by a score of 7–8, and the diagnosis is strongly supported by a score of 9–10.

A maximum of 16 points are awarded using the RIPASA scoring method (Annex D). A maximum of

three points are awarded for each of the three demographic variables: one point for foreign nationals, 0.5 points for females, one point for age under 39.9 years, and 0.5 points for those over 40. Right iliac fossa pain, pain that migrates to the right iliac fossa, and symptoms lasting longer than 48 hours are all worth 0.5 points. Loss of appetite, nausea, and vomiting that lasts shorter than 48 hours are worth one point. One point for leukocytosis, elevated temperature, Blumberg sign, right iliac fossa discomfort, and negative urinalysis. The Rovsing sign and right iliac fossa guarding receive two points. An appendicitis diagnosis is deemed positive if the RIPASA score is greater than 7.5.

Before giving analgesics and obtaining consent, an ER/OPD resident completed a questionnaire for every patient who arrived at the hospital with a suspected case of AA. For comparison with histology as the gold standard, the scores were then manually computed to tentatively classify the patient into either the appendicitis or non-appendicitis category. However, the consulting surgeon decided to conduct an appendectomy on a patient. Histopathological findings were acquired from the lab and documented following the appendectomy. To reduce biases and confounders, the data was gathered using stringent and clearly stated inclusion and exclusion criteria, and any lingering issues were resolved throughout the analysis stage.

TP stands for true positive. Patients will be categorized as true positives (TP) if their RIPASA score is greater than 7.5 and their Alvarado score is greater than 6, both of which are confirmed by histology as AA.

TN stands for true negative. Patients who have a RIPASA score of 7.5 and an Alvarado score of < 6 and whose histology confirms they do not have acute appendicitis will be categorized as true negatives (TN).

FP, or false positive. False positive (FP) patients are those who have an Alvarado score greater than 6 and a RIPASA score greater than 7.5 but whose histology does not confirm them as AA.

Negative False (FN). Patients who are confirmed as AA on histology and have an Alvarado score of ≤ 6 and a RIPASA score of ≤ 7.5 will be labeled as false negatives (FN).

sensitivity. The ability of a test to identify a disease when it exists is measured by its sensitivity. It is stated as follows: Specificity. is a diagnostic test's capacity to accurately identify individuals who are not afflicted. A positive predictive value. the likelihood that a positive test will accurately reflect the presence of the disease, or the percentage of those with a positive test

result who actually have it.

Predictive value is negative. The probability that a negative test will accurately reflect the absence of disease, or the percentage of people with a negative test result who are actually disease-free.

Version 22 of the Statistical Package for the Social Sciences (SPSS) was used to enter the data gathered

from the recommended questionnaire. The independent sample-t test and the Chi-Square test were used to compare continuous and categorical variables, respectively. By creating 2×2 contingency tables against the gold-standard diagnosis, the diagnostic accuracy of the Alvarado and RIPASA scoring systems was assessed. Sensitivity, specificity, positive predictive value, and negative predictive value were then computed.

RESULTS

Participants in the study were between the ages of 11 and 69, with a mean age of 39.76 ± 7.12 years. 109 (58.60%) of the patients were between the ages of 11 and 40 years, according to Table I. Of these 186 individuals, 91 (48.92%) were male and 95 (51.08%) were female, resulting in a male to female ratio of 1.1:1. Mean BMI was 27.04 ± 3.38 kg/m². Table I displays the distribution of patients with different factors.

Thirteen patients (False Positive) had no acute appendicitis based on histopathology, while 115 patients (True Positive) had acute appendicitis among those who tested positive for RIPASA score. 50 (True Negative) and 08 (False Negative) of the 58 patients with negative RIPASA score exhibited acute appendicitis on histopathology, respectively ($p=0.0001$), as indicated in Table II. 93.50% RIPASA score sensitivity, 79.37% specificity, 89.84% PPV, 86.21% NPV, and 88.71% diagnostic accuracy were used to diagnose acute appendicitis.

17 patients (False Positive) had no acute appendicitis based on histopathology, while 110 patients (True Positive) had acute appendicitis among those who tested positive for alvarado score. 46 (True Negative) and 13 (False Negative) of the 59 patients with negative alvarado score exhibited acute appendicitis on histopathology, respectively ($p=0.0001$), as indicated in Table III. 89.43% Alvarado score sensitivity, 73.02% specificity, 86.61% PPV, 77.97% NPV, and 83.87% diagnostic accuracy were used to diagnose acute appendicitis.

Table I: Distribution of patients with variables (n=186)

		Frequency	%age
Age (years)	11-40	109	58.60
	41-69	77	41.40
Gender	Male	91	48.92
	Female	95	51.08
BMI (kg/m ²)	≤30	140	75.27
	>30	46	24.73

Table-II: Diagnostic accuracy of RIPASA score among patients undergoing appendectomy for suspected acute appendicitis.

	Histopathology (+ive)	Histopathology (-ive)	P-value
RIPASA score (+ive)	115 (True positive)	13 (False Positive)	0.0001
RIPASA score (-ive)	08 (False negative)	50 (True Negative)	

- Sensitivity: 93.50%
- Specificity: 79.37%
- Positive Predictive Value (PPV): 89.84%
- Negative Predictive Value (NPV): 86.21%
- Diagnostic Accuracy: 88.71%

Table-II: Diagnostic accuracy Alvarado score among patients undergoing appendectomy for suspected acute appendicitis.

	Histopathology (+ive)	Histopathology (-ive)	P-value
Alvarado score (+ive)	110 (True positive)	17 (False Positive)	0.0001
Alvarado score (-ive)	13 (False negative)	46 (True Negative)	

- **Sensitivity:** 89.43%
- **Specificity:** 73.02%
- **Positive Predictive Value (PPV):** 86.61%
- **Negative Predictive Value (NPV):** 77.97%
- **Diagnostic Accuracy:** 83.87%

DISCUSSION

In surgical practice, acute appendicitis is a common surgical emergency. The diagnosis depends on the doctor's clinical experience in the emergency department and accident room. The main diagnostic method is a comprehensive clinical examination of the abdomen; however, imaging and laboratory testing, including abdominal ultrasound, may be used to support the clinical assessment.⁹

In line with the results of this investigation, Majid et al. discovered that the RIPASA score was 89% accurate in identifying acute appendicitis, while the Alvarado score was 72%. For diagnosing acute appendicitis, the RIPASA scoring's diagnostic accuracy, sensitivity, specificity, PPV, and NPV were 92.1%, 62.1%, 95.2%, 48.6%, and 88.9%, respectively, whereas the Alvarado scoring's were 72.6%, 68.9%, 95.1%, 23.2%, and 72.2%, respectively.¹⁰

According to a Kohat study, the RIPASA score is a useful new diagnostic score for acute appendicitis in the local population, with a diagnosis accuracy of 95.1%.¹¹ Another study conducted in Karachi, Pakistan, found that RIPASA is a sensitive and dependable diagnostic technique for acute appendicitis when compared to the Alvarado score.¹² Another study in Peshawar, Pakistan, found that emergency room physicians can use the RIPASA grading system to identify acute appendicitis with high sensitivity but low specificity.¹³

A study in Rajasthan, India, found that the RIPASA and Alvarado scores for diagnosing acute appendicitis had sensitivity, specificity, PPV, NPV, and diagnostic accuracy of 94.7%, 60%, 97.8%, 37.5%, and 93%, respectively, and 67.3%, 80%, 98.4%, 11.4%, and 68%, respectively.¹⁴

One Indian study found that the RIPASA score has a 90.5% specificity and a 96.2% sensitivity. The Alvarado score has a 58.9% sensitivity and an 85.7% specificity for diagnosing acute appendicitis.¹⁵ The

RIPASA score may identify cases of acute appendicitis with a sensitivity of 96.7% and specificity of 93.0%, per studies conducted in Pakistan.¹⁶ Another study conducted in Pakistan by Damani et al. found that the RIPASA score had a sensitivity of 91.1% and a specificity of 60%. The specificity of the Alvarado score was 95%.¹² While the sensitivity was 11.67%. A worldwide investigation, however, discovered that RIPASA had a sensitivity of 86.6% and a specificity of only 66.7%, making it only moderately accurate. The specificity and sensitivity of the Alvarado score were 72.2% and 67.1%, respectively.⁸

The diagnostic accuracy of the RIPASA and Alvarado ratings was 93.2%. However, another study conducted in Jordan found that their sensitivity, specificity, PPV, and NPV to detect acute appendicitis were 61.8%, 92.2%, 64.9%, and 91.5% and 73.7%, 68.6%, 92.1%, 34.8%, and 74.3%, respectively.¹⁶ In contrast to this study, a study by Chong et al. shown a higher diagnostic accuracy of the RIPASA score. Chong et al. found that 98% of patients who were accurately identified with acute appendicitis (RIPASA score >7.5) received the proper treatment.¹⁷

The RIPASA scoring system's sensitivity and specificity in study 5 are 97.14% and 60%, respectively. According to a similar study, the ALVARADO score's sensitivity and specificity are 52.9% and 40%, respectively. According to Tinaikar A et al.¹⁸, the RIPASA score's sensitivity and specificity are 91.78% and 66.66%, respectively. The Alvarado score had a sensitivity of 64.38% and a specificity of 58.33%. According to Shuaib A et al.¹⁹, the RIPASA score's sensitivity and specificity are 94.50% and 88.0%, respectively, and the prevalence of acute appendicitis is 81.6%. The Alvarado score had a sensitivity of 82.8% and a specificity of 58.0%. According to Elhosseiny MM et al.²⁰, the RIPASA score's sensitivity and specificity are 100.0% and 75.0%, respectively. The Alvarado score had a

sensitivity of 65.2% and a specificity of 100.0%. According to Noor S. et al.²¹, the RIPASA score's sensitivity and specificity are 98.52% and 90%, respectively, and 68.15% and 80%.

In a research, RIPASA's specificity was 88.89% (95% CI 67.2, 96.9) and its sensitivity was 82.61% (95% CI 72.02, 89.76). Its diagnostic accuracy rate was 83.91% (95% CI 74.78, 90.17), its NPV was 57.14% (95% CI 39.07, 73.49), and its PPV was 96.61% (95% CI 88.46, 99.07).²² Twelve studies that recruited 2161 patients were included in a meta-analysis. 94% (95% CI, 92%-95%) was the RIPASA score's sensitivity, and 55% (95% CI, 51%-55%) was its specificity. Furthermore, the diagnostic odds ratio was 24.66 (95% CI, 8.06 to 75.43) and the area under the Roc curve (AUC) was 0.9431.²³

Of the 308 patients in another local study, 288 had surgery for AP; 165 (57.3%) were men and 123 (42.7%) were women. Of these, 252 (87.5%) had positive histology reports and 36 (12.5%) had negative ones, resulting in a negative appendectomy rate of 12.5%, which is much lower than the average. Eight (2.8%) suffered a post-operative wound infection, and 26 (9.02%) had an appendix perforation. At a cut-off of 7.5, the RIPASA score's sensitivity was 98.02%, its specificity was 75%, its positive predictive value was 96.48%, and its negative predictive value was 84.7%. In contrast, Alvarado's score had a sensitivity of 53% and a specificity of 75%.²⁴

75 patients were enrolled in a different study. 52.85% of patients with acute appendicitis were accurately diagnosed using the Alvarado scoring system, whereas 97.1% of patients with the RIPASA scoring system were. The RIPASA scoring system has a sensitivity of 97.14% and a specificity of 60%. The Alvarado scoring system has a 52% diagnostic accuracy, while the RIPASA scoring system has a 94.67% accuracy rate. The findings show that acute appendicitis can be diagnosed more accurately using the RIPASA scoring system ($p < 0.001$).²⁵

Results from the RIPASA scoring system were more dependable than those from the Alvarado scoring system. In order to diagnose acute appendicitis in the future, it is advised that the RIPASA scoring system be given priority.

Due to time and budgetary constraints, the study's tiny sample size was one of its shortcomings. The fact that the trial was single-center was another drawback. The findings of this study could not be applied to the entire population because of the single-center design and non-probability sampling method.

CONCLUSION:

According to this study, the RIPASA scoring system is a straightforward, easy, highly sensitive, and

accurate way to diagnose acute appendicitis compared to the Alvarado scoring system. It has also significantly improved our ability to diagnose acute appendicitis accurately and has improved patient care by preventing negative appendectomies and providing timely, appropriate treatment, which lowers patient morbidity and mortality. Therefore, in order to lower the rate of negative appendectomies, we advise that the RIPASA scoring system be regularly employed as a prime test for appendicitis diagnosis.

REFERENCES:

1. Madhushankar L, Rai R, Anirudh V, Reddy AVK. Comparison of modified Alvarado and RIPASA scoring systems correlated with intra-operative findings in predicting acute appendicitis. *Int Surg J*. 2021 Aug 27;8(9):2662.
2. Ødegaard BS, Søreide K. The Diagnostic Differentiation Challenge in Acute Appendicitis: How to Distinguish between Uncomplicated and Complicated Appendicitis in Adults. *Diagnostics*. 2022;12,1724.
3. Reddy SSSP, Prashanth YV, Stallin K. A comparative study of RIPASA score and modified Alvarado score in diagnosis of acute appendicitis. *Int J Surg Sci*. 2024 Jan 1;8(2):26–32.
4. Rasheed Z, Sayyed S, Ali I, Hameed F, Rizwan M, Naz G, et al. Diagnostic Accuracy of Modified Alvarado Score (MAS) and Ohmann Scores (OS) in Diagnosing Acute Appendicitis. *Pak J Med and Health Sci*. 2023 Apr 20;17(3):298–300.
5. Bahrami M, Mirgaloyebayat H, Mohajeri Z, Mohammadi H, Afshari SA, Fazeli P, et al. The diagnostic value of the computed tomography scan and ultrasonography in acute appendicitis. *Am J Nucl Med Mol Imaging*. 2023;13(1):11-17
6. Gebreselassie H, Zeleke H, Ashebir D. Diagnosis of acute appendicitis: a cross-sectional Study on Alvarado's Score from a low-income country. *Open Access Emerg Med*. 2023; 15:253–8.
7. Chong CF, Thien A, Mackie AJA, Tin AS, Tripathi S, et al. Comparison of RI PASA and Alvarado scores for the diagnosis of acute appendicitis. *Singapore Med J*. 2011. 201 I ;52(5): 340-345
8. Heiranizadeh N, Mousavi Beyuki SMH, kargar S, Abadiyan A, Mohammadi HR. Alvarado or RIPASA? Which one do you use to diagnose acute appendicitis? A cross-sectional study. *Health Sci Rep* 2023; 6(1):e1078. doi: 10.02/hsr2. 1078.
9. Shams Ud Din S, Ullah Baig I, Tassawar Hussain M, Sadiq A, Humayun T, Ahmad U, Syed A. RIPASA versus Alvarado score in the assessment of acute appendicitis: A prospective study. *Turk J*

- Surg. 2023 Sep 27;39(3):231-236. doi: 10.47717/turkjsurg.2023.6124.
10. Majid M, Maqsood R, Ali M, Malhi MAA, Hussain Z, Abbasi MH. Comparison of Alvarado score and RIPASA score in the accurate diagnosis of acute appendicitis in Combined Military Hospital Rawalpindi: Scoring systems in acute appendicitis. *Pak Armed Forces Med J* 2021; 71(5): 1519-23. doi: 10.51253/pafmj.v71i5.3596.
11. Butt MQ, Chatha SS, Ghumman AQ, Farooq M. RIPASA score: A new diagnostic score for diagnosis of acute appendicitis. *J Coll Physicians Surg Pak* 2014; 24(12): 894-7.
12. Damani S, Sagheer S, Shah H, Hashami A. Effective diagnosis of acute appendicitis—comparison of RIPASA and Alvarado scoring systems. *J Surg Pak* 2016; 21(3):3-6. doi: 10.21699/jsp.21.3.3.
13. Khan A, Mumtaz N, Malik A, Khan S, Gul A, Asmat S, et al. Diagnostic accuracy of RIPASA score for diagnosing acute appendicitis keeping histopathology as gold standard. *Biol Clin Sci Res J* 2023; 4(1):567. doi: 10.54112/bcsrj.v2023i1.567.
14. Regar MK, Choudhary GS, Nogia C, Pipal DK, Agrawal A, Srivastava H. Comparison of Alvarado and RIPASA scoring systems in diagnosis of acute appendicitis and correlation with intraoperative and histopathological findings. *Int Surg J* 2017; 4(5):1755-61. doi: 10.18203/2349-2902.isj20171634.
15. Nanjurdaiah N, Mohammed A, Shanbhag V, Ashfaq K, Priya SA. A comparative study of RIPASA score and Alvarado score in the diagnosis of acute appendicitis. *J Clin Diag Res* 2014; 8(11):NC03-5. doi: 10.7860/jcdr/2014/9055.5170.
16. Alnjadat I, Abdallah B. Alvarado versus RIPASA score in diagnosing acute appendicitis. *RMJ* 2013; 38(2):147-51.
17. Chong C, Adi M, Thien A, Suyoi A, Mackie A, Tin A, et al. Development of the RIPASA score: A new appendicitis scoring system for the diagnosis of acute appendicitis. *Singapore Med J* 2010; 51(3):220.
18. Tinaikar A, Naik V. An observational comparative study between RIPASA & modified alvarado scoring in the diagnosis of acute appendicitis. *Int J Surg Sci*. 2019;3(4):510-3.
19. Shuaib A, Shuaib A, Fakhra Z, Marafi B, Alsharaf K, Behbehani A. Evaluation of modified Alvarado scoring system and RIPASA scoring system as diagnostic tools of acute appendicitis. *World J Emerg Med*. 2017;8(4):276–280.
20. Elhosseiny MM, Eltokhy E, Elekiabi OA, Elaidy MM, Elshahidy TM, et al. Comparative study between alvarado score & ripasa score in diagnosis of acute appendicitis. *J Surg*. 2018;6(2):5-10.
21. Noor S, Wahab A, Afridi G, Kaleemullah. Comparing RIPASA score and Alvarado score in an accurate diagnosis of acute appendicitis *J Ayub Med Coll Abbottabad*. 2020;32(1):38–41.
22. Rathod S, Ali I, Bawa AP, Singh G, Mishra S, Nongmaithem M. Evaluation of Raja Isteri Pengiran Anak Saleha Appendicitis score: A new appendicitis scoring system. *Med J DY Patil Univ* 2015;8:744-9.
23. Frountzas M, Stergios K, Kopsini D, Schizas D, Kontzoglou K, Toutouzias K. Alvarado or RIPASA score for diagnosis of acute appendicitis? A meta-analysis of randomized trials. *Int J Surg*. 2018 Aug;56:307-314.
24. Akbar I, Shehzad JA, Ali S. Diagnostic Accuracy of RIPASA. *J Ayub Med Coll Abbottabad* 2019;31(3):411–4.
25. Sanjive JG, Ramaiah RH. Comparison of RIPASA and Alvarado scoring in the diagnosis of acute appendicitis and validation of RIPASA scoring. *Int Surg J* 2019;6:935-9.