International Journal of Health Sciences and Research
Vol.12; Issue: 7; July 2022
Website: www.ijhsr.org
Original Research Article *ISSN: 2249-9571*

Characteristics of Distal Radius Fracture Patients at Gema Santi Nusa Penida Hospital in 2020-2021

I Kadek Jaya Santika

General Practitioner, Gema Santi Nusa Penida Hospital, Klungkung, Bali, Indonesia

DOI: https://doi.org/10.52403/ijhsr.20220714

ABSTRACT

Introduction: Distal radius fracture is the most common fracture found in Gema Santi Nusa Penida Hospital. The incidence of distal radius fracture peaks in the paediatric who experience high energy fall which predominantly males and then the elderly population with osteoporotic bone experiencing low energy fall which predominantly females. A study is needed to determine the fracture characteristics which in this study discusses about the distal radius fracture.
Methods: This research is a retrospective study with the population was all distal radius fracture patients who were treated at Gema Santi Nusa Penida Hospital from 2020 to 2021. The research sample was collected using a total sampling technique obtained from the patient medical record of the emergency unit and general surgery clinic.
Results: Of the 44 samples obtained, the most cases of distal radius fracture were in the age range of 11-20 years with male gender caused by traffic accidents and then in the age range of 61-70 years with female gender caused by falling from a standing height.
Conclusion: Most cases in the elderly female may relate to the onset of postmenopausal osteoporosis. Cases that often occur at a young age due to traffic accidents need further policy to improve the safety of motorized vehicle drivers. Special treatment also needs to be done in osteoporotic elderly women to reduce complications that can occur due to osteoporosis such as fractures of the distal radius.

Keywords: Distal radius fracture; Young; Elderly; Traffic accidents; Osteoporotic bone

INTRODUCTION

Fractures are one of the most common diseases encountered in the emergency department. One of the most common types of fractures in the upper extremity is distal radius fracture. Distal radius fractures account for one-sixth of all emergency department visits. The radius is the long bone that is most fractured based on a cohort data of 208,094 patients from the United States. [1] In one hospital in Indonesia, the incidence of distal radius fracture is 677 patients within a period of 5 years.[2] The incidence of distal radius fracture peaks in the paediatric and elderly population which predominantly males paediatric population and predominantly females in elderly population.[3]

Distal radius fracture usually occurs at a young age who experience high energy fall, or it may also occur in older people with bones that have osteoporosis and then experience low energy fall. Treatment depends on whether the fracture is intra- or extra-articular and the degree of fragmentation of the joint surface and metaphysis. There are some early and late complications of the distal radius fracture. Early complications are circulatory problem, nerve injury, complex regional pain syndrome, ulnar corner pain, associated injury of the carpus and redisplacement. The late complications are malunion, delayed union and non-union, tendon rupture, carpal instability, secondary osteoarthritis. [4]

Distal radius fracture is the most common fracture found in Gema Santi Nusa Penida Hospital. Characteristics of distal radius fracture need to be known to be used as the next basic reference in terms of prevention and treatment of distal radius fracture. Until now there has been no research that discusses about fractures on the Nusa Penida region. A study is needed to determine the fracture characteristics which in this study discusses about the distal radius fracture. This study aims to determine the characteristics of distal radius fractures at Gema Santi Nusa Penida Hospital based on age, gender, cause, open or closed, accompanying complaints, length of hospitalization and treatment carried out.

METHODS

The study population was all distal radius fracture patients who were treated at Gema Santi Nusa Penida Hospital from 2020 to 2021. The research sample was collected using a total sampling technique obtained from the patient medical record of the emergency unit and general surgery clinic which then further data was taken from medical records in the medical record storage room of Gema Santi Hospital Nusa Penida and obtained 44 samples. The inclusion criteria for sample included in the research were distal radius fracture patients who were treated at Gema Santi Nusa Penida Hospital from 2020 to 2021 and their medical record data contained age, gender, type of fracture, causes and management carried out. Exclusion criteria were incomplete medical records such as not including age, gender, type of fracture, causes and management carried out.

This study uses a retrospective observational descriptive approach. The data that has been collected is then analysed using the SPSS statistics 25th edition which is then presented in the form of tables and narratives.

RESULT

Of the 44 samples obtained, the youngest age is 5 years old and the oldest is 76 years old. The most cases of distal radius fracture were in the age range of 11-20 years, namely 11 cases (25%), followed by ages 61-70 years namely 9 cases (20.5%), 51-60 years, namely 8 cases (18.2%), 21-30 years namely 5 cases (11.4%), 41-50 years namely 4 cases (9.1%), 0-10 years namely 3 cases (6.8%), 31-40 years namely 2 cases (4.5%) and the least number of cases was age 71-80 year namely 2 cases (4.5%). Based on gender, a total of 25 (56.8%) female samples and 19 (43.2%) male samples. If the youngest age ranges and the highest old age ranges are grouped by gender, then in the 11-20 year age range, male 8 (72.7%) cases and female 3 (27.3%) cases, while in the age range 61-70 years, namely male 1 (11.1%) cases and female 8 (88.9%) cases.

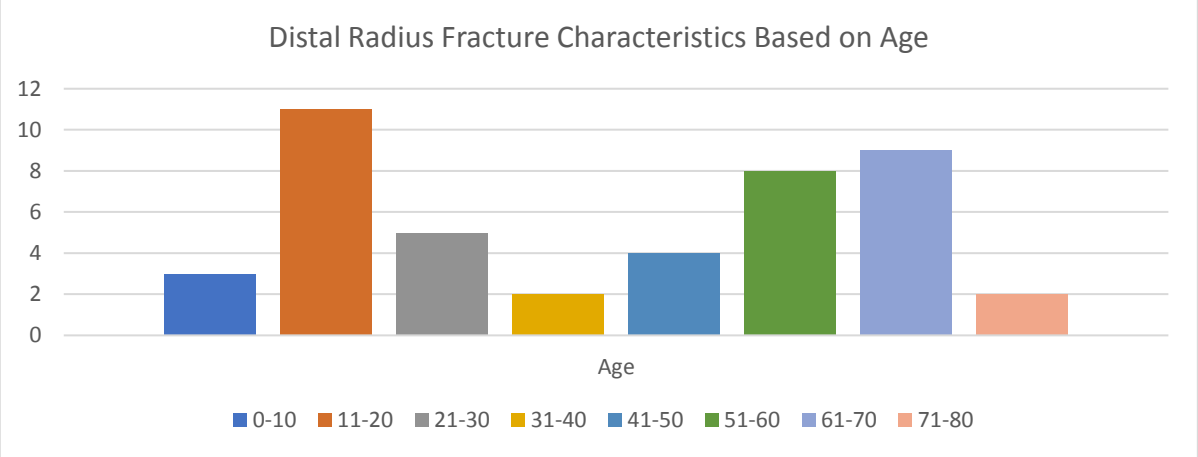

Figure 1. Distal Radius Fracture Characteristics Based on Age

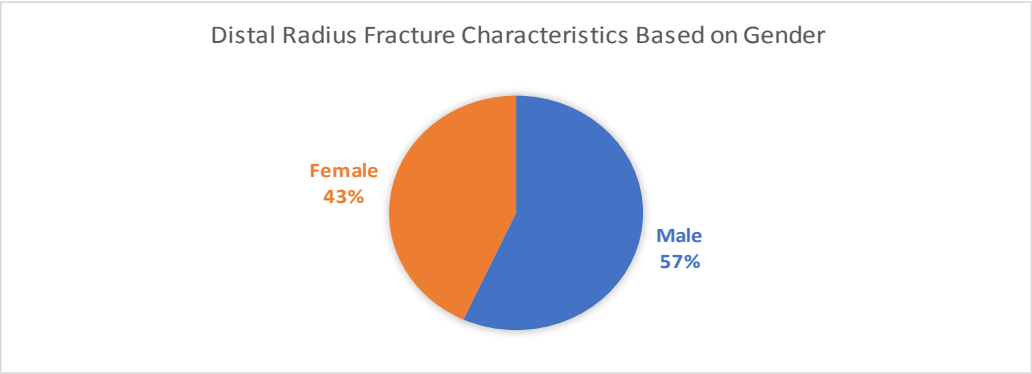

Figure 2. Distal Radius Fracture Characteristics Based on Gender

Based on the causes of distal radius fracture, due to vehicle accident 20 (45.5%) cases, due to fall from standing height 19 (43.2%) cases, due to fall from height higher than standing height 4 (9.1%) cases and sport activity 1 (2.3%) case. If the two most common causes are grouped by age, the most vehicle accidents are in the age range of 11-20 years, namely 7 (35.0%) cases and the highest fall from standing height is at the age of 61-70 years, namely 7 (36.8%) cases. When grouped based on open or closed fractures, cases of distal radius fracture were more in the form of closed fractures, namely 40 (90.9%) cases than open fractures, namely 4 (9.1%) cases. Based on the side of the extremity, there were more on the left side, namely 23 (52.3%) cases than the right side, namely 21 (47.7%) cases.

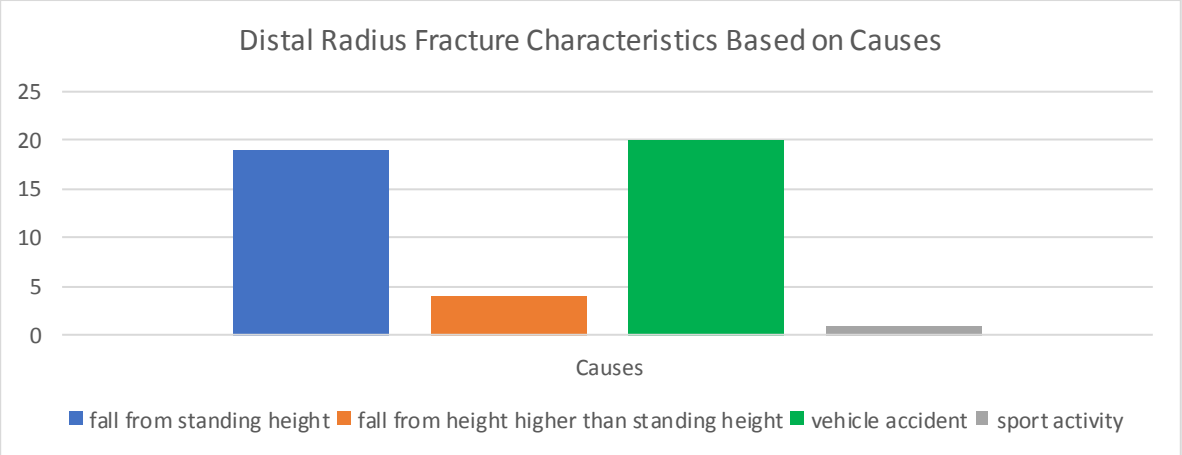

Figure 3. Distal Radius Fracture Characteristics Based on Causes

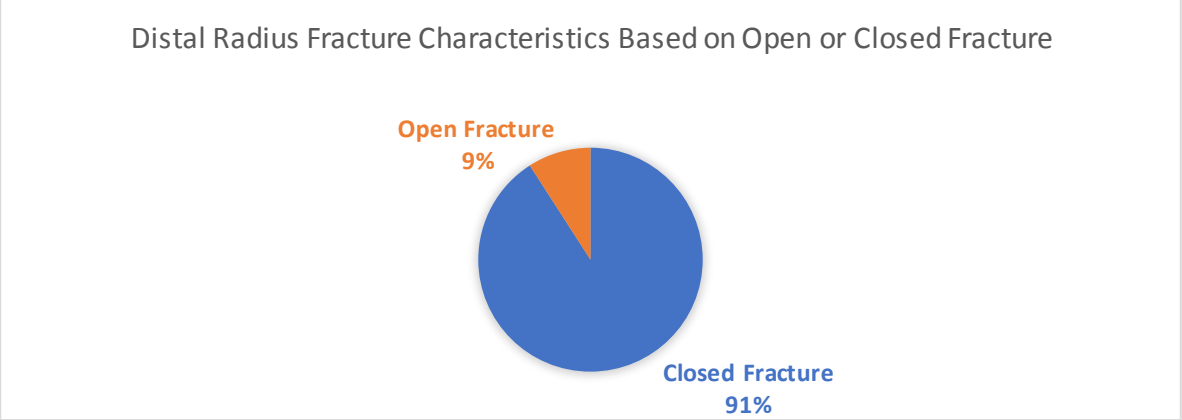

Figure 4. Distal Radius Fracture Characteristics Based on Open or Closed Fracture

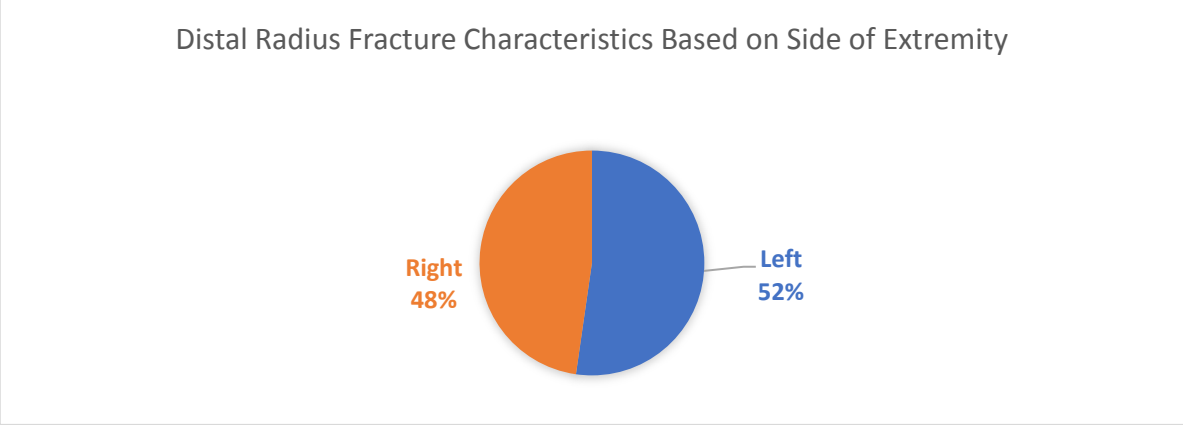

Figure 5. Distal Radius Fracture Characteristics Based on Side of Extremity

The most common accompanying complaints were upper limb fractures (ulnar fracture, metacarpal phalanx fracture) in 13 (29.5%) cases, followed by joint dislocation (elbow dislocation) 1 (2.3%) cases, lower limb fracture (patellar fracture) 1 (2.3%) cases and the remaining 29 (65.9%) cases without accompanying complaints.

Based on the length of hospitalization, 30 (68.2%) cases were not hospitalized, and 14 (31.8%) cases were treated for 1 day. If grouped based on the treatment, closed reduction and immobilization with short arm cast were 15 (34.1%) cases, referral to an orthopedic surgeon in 28 (63.6%) cases and rehabilitation in 1 case (2.3%).

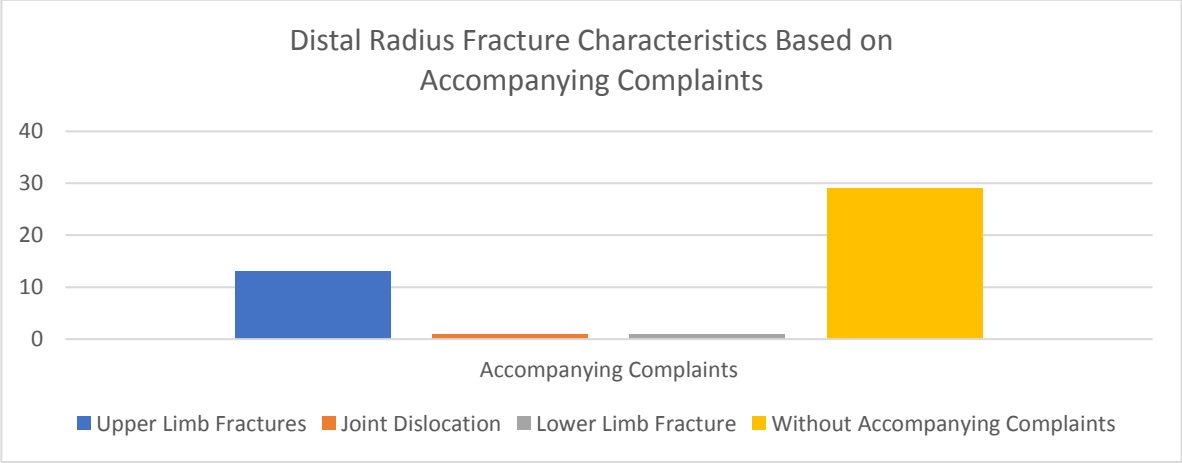

Figure 6. Distal Radius Fracture Characteristics Based on Accompanying Complaints

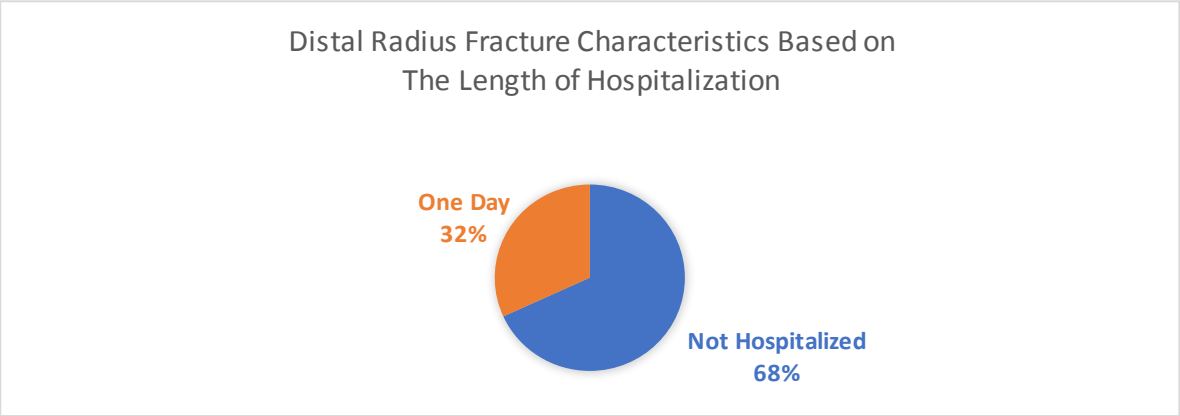

Figure 7. Distal Radius Fracture Characteristics Based on The Length of Hospitalization

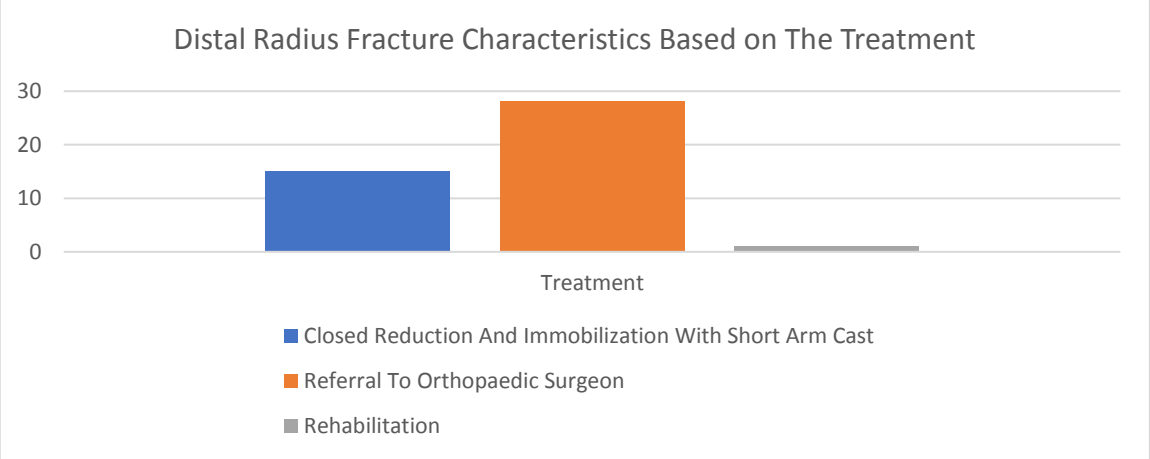

Figure 8. Distal Radius Fracture Characteristics Based on The Treatment

DISCUSSION

Based on the results above, the most cases were in the age range of 11-20 years, then decreased and then increased again in the age range of 51-70 years. If grouped according to gender, in the age range of 11-20 years, more cases are found in males than females. Then in the age range of 51-70 years, more cases in women than men. This is in accordance with the epidemiological study by MacIntyre et al. who obtained the results that the most cases of distal radius fracture were in adults aged 50 years or more and children aged 18 years or less, which at the age of children cases were more in boys and at the age of 50 years or more were more in women. In this study, it was explained that the risk of distal radius fracture in women aged over 65 years was 5 times greater than in men. [1] In the study by Azad et al, it was also found that the highest peak cases were at the age of 10-14 years and above 65 years. The results also showed that cases at the age of 0-19 years were more in men (60.2%) and at the age above 65 years were more in women (85.4%). [3] The increased incidence in elderly especially women may related to the onset of postmenopausal osteoporosis. [4]

Based on the causes of distal radius fractures, the most common causes are traffic accidents, which are more common in the age range of 11-20 years and followed by cases of falling from a standing height, which are more common in the age range of 61-70 years. This is also in accordance with the epidemiological study by MacIntyre et al. who explained that the most common causes in children and young people are sports activities and traffic accidents, while in old age it is the result of falling from a standing height. [1] This is also in accordance with research by Tantri et al. which is the most common causes of distal radius fracture is traffic accidents. [2]

The most common accompanying complaints other than cases of distal radius fracture without accompanying complaint is upper limb fractures (ulnar fracture, metacarpal phalanx fracture). Based on the study by Mulders M et al. and Yuan C et al, there was no difference in functional outcome between distal radius fractures with or without ulnar styloid fracture. [5-6]

In this study, it was found that most cases were referred to orthopaedic surgeon and the rest underwent closed reduction and immobilization with short arm casts and then rehabilitation. In cases other than those referred to orthopaedic surgeon, is in accordance with the study by Azad et al. where treatment for most cases is closed reduction [3]. Based on the study by He B et al., the nonoperative treatment for distal radius fracture gives no significant differences in most functional assessments compared with operative treatment [7] In another study by Ochen Y et al., the operative treatment improved DASH score and grip strength more than nonoperative

treatment but not in patient 60 years or older. [8] This results consistent with the guideline from American Academy of Orthopaedic Surgeon (AAOS) which explain that strong evidence suggests that operative treatment for geriatric patients (most commonly defined in studies as 65 years of age and older) does not lead to improved long-term patient reported outcomes compared to non-operative treatment and moderate evidence supports that for non-geriatric patients (most commonly defined in studies as under 65 years of age), operative treatment for fractures with post reduction radial shortening >3mm, dorsal tilt >10 degrees, or intraarticular displacement or step off >2 mm leads to improved radiographic and patient reported outcomes. [9]

CONCLUSION

The most cases of distal radius fracture are in the age range of 11-20 years with male sex and in the age range of 61-70 years with female gender which may related to the onset of postmenopausal osteoporosis. Cases that often occur at a young age due to traffic accidents need further handling to improve the safety of motorized vehicle drivers. Special treatment also needs to be done in osteoporotic elderly women to reduce complications that can occur due to osteoporosis such as fractures of the distal radius. The availability of orthopedic surgeon is needed to minimize referrals to the higher center.

Acknowledgement: None
Conflict of Interest: None
Source of Funding: None
Ethical Approval: Approved

REFERENCES

1. MacIntyre NJ, Dewan N. Epidemiology of distal radius fractures and factors predicting risk and prognosis. Journal of Hand Therapy. 2016 Apr;29(2):136–45.
2. Tantri IN, Asmara AAGY, Hamid ARRH. Gambaran karakteristik fraktur radius distal di RSUP Sanglah Tahun 2013-2017. Intisari Sains Medis. 2019 Sep 2;10(3).
3. Azad A, Kang HP, Alluri RK, Vakhshori V, Kay HF, Ghiassi A. Epidemiological and Treatment Trends of Distal Radius Fractures across Multiple Age Groups. Journal of Wrist Surgery. 2019 Aug 16;08(04):305–11.
4. Ashley W. Blom, David Warwick, Michael R. Whitehouse. Apley & Solomon's System of Orthopaedics and Trauma 10th Edition. CRC Press; 2018. 797–813 p.
5. Mulders MAM, Fuhri Snethlage LJ, de Muinck Keizer R-JO, Goslings JC, Schep NWL. Functional outcomes of distal radius fractures with and without ulnar styloid fractures: a meta-analysis. Journal of Hand Surgery (European Volume). 2018 Feb 20;43(2):150–7.
6. Yuan C, Zhang H, Liu H, Gu J. Does concomitant ulnar styloid fracture and distal radius fracture portend poorer outcomes? A meta-analysis of comparative studies. Injury. 2017 Nov;48(11):2575–81.
7. He B, Tian X, Ji G, Han A. Comparison of outcomes between nonsurgical and surgical treatment of distal radius fracture: a systematic review update and meta-analysis. Archives of Orthopaedic and Trauma Surgery. 2020 Aug 28;140(8):1143–53.
8. Ochen Y, Peek J, van der Velde D, Beeres FJP, van Heijl M, Groenwold RHH, et al. Operative vs Nonoperative Treatment of Distal Radius Fractures in Adults. JAMA Network Open. 2020 Apr 23;3(4):e203497.
9. American Academy of Orthopaedic Surgeons. Management of Distal Radius Fractures Evidence-Based Clinical Practice Guideline. www.aaos.org/drfcpg. 2020.

How to cite this article: I Kadek Jaya Santika. Characteristics of distal radius fracture patients at Gema Santi Nusa Penida hospital in 2020 - 2021. *Int J Health Sci Res.* 2022; 12(7):103-108. DOI: *https://doi.org/10.52403/ijhsr.20220714*

******