

Health care durations and health care expenses of patients with femoral shaft fractures who underwent intramedullary nailing: retrospective cohort study

Andre Bern V Arcenas,¹ Noel Rex P Peñaranda,¹ Maria Elinore Alba-Concha²

¹Department of Orthopedics, Southern Philippines Medical Center, JP Laurel Ave, Davao City, Philippines
²Professional Education, Training, and Development, Southern Philippines Medical Center, JP Laurel Ave, Davao City, Philippines

Correspondence
Andre Bern V Arcenas,
andrebern2376@gmail.com

Received
26 August 2021

Accepted
16 June 2023

Published online
29 June 2023

Cite as
Arcenas ABV, Peñaranda NRP, Alba-Concha ME. Health care durations and health care expenses of patients with femoral shaft fractures who underwent intramedullary nailing: retrospective cohort study. *SPMC J Health Care Serv.* 2023;9(1):7. <http://n2t.net/ark:/76951/jhcs3vg4g6>

Copyright
© 2023 ABV Arcenas et al.

ABSTRACT

Background. In 2016, the Philippine Health Insurance Corporation (PhilHealth) introduced the Z-package to provide financial coverage for, among others, intramedullary nailing procedures and implant costs for eligible patients with femoral shaft fractures.

Objective. To compare health care durations and expenses between patients with closed femoral shaft fractures requiring intramedullary fixation who utilized the PhilHealth Z-package and those who did not.

Design. Retrospective cohort study.

Setting. Orthopedic Ward, Southern Philippines Medical Center, Davao City, January to December 2018.

Participants. 66 male and female patients, aged 19 to 39 years, who underwent intramedullary nailing for closed femoral shaft fractures.

Main outcome measures. Time to surgery, length of hospital stay, total hospital bill, total PhilHealth coverage, other funds for medical assistance (OFMA) coverage, and out-of-pocket (OOP) expenses.

Main results. Among the 66 patients, 33 had the Z-package, while the remaining 33 did not. The median time to surgery (19 days vs 24 days; $p=0.156$), median length of hospital stay (24 days vs 29 days; $p=0.546$), and median total hospital bill (Php 62,392.00 vs Php 62,404.80; $p=0.314$) were comparable between those without the Z-package and those who had, respectively. However, patients without the Z-package had significantly lower total PhilHealth coverage (Php 30,740.00 vs Php 48,740.00; $p<0.001$) and higher OFMA coverage (Php 49,909.90 vs Php 34,409.20; $p=0.024$), and OOP expenses (Php 0.00; IQR: Php 0.00 to Php 20,000.00 vs Php 0.00; IQR: Php 0.00 to Php 0.00; $p=0.004$) compared to those with the Z-package.

Conclusion. Patients with the Z-package had a slightly longer time to surgery, although this difference was not statistically significant. However, they benefited from significantly lower remaining bills after PhilHealth coverage and reduced OOP expenses compared to patients without Z-package coverage.

Keywords. PhilHealth coverage, out-of-pocket expenses, medical assistance, length of stay, time to surgery

INTRODUCTION

Orthopedic injuries needing fixation can result in a substantial financial burden on patients, particularly in settings with limited resources.¹ The cost of orthopedic implants alone can be significant and may force patients to postpone treatment, receive inadequate treatment, or forgo treatment altogether. Such delays and inadequate treatment can result in poor patient outcomes, as well as productivity loss.^{2,3}

Delaying orthopedic surgery can increase the risk of postoperative complications, ranging from minor issues, such as pressure sores and superficial wound infections, to more severe problems, such as respiratory complications, cardiac events, and deep vein thrombosis.⁴ The odds of experiencing any of these complications were found to be 1.11 to 2.08 times higher for patients with delayed surgery.^{5,6} Orthopedic patients who

experience delays in surgery also have a higher mortality risk compared to those who receive timely intervention.⁶⁻¹⁰ Patients who experienced delayed orthopedic surgery had mortality rates ranging from 12.35% to 38.71%,^{9,10} while the odds of dying were

IN ESSENCE

The financial burden of intramedullary fixation in orthopedic injuries is substantial.

Introduced in 2016, the PhilHealth Z-package provides financial coverage for services like intramedullary nailing and implant expenses for femoral shaft fractures.

In this cohort study, patients without Z-package coverage had significantly higher coverage from other funds for medical assistance and out-of-pocket expenses compared to those with the package.



found to be between 1.09 and 4.5 times higher among patients with delayed surgery compared to those who received timely intervention.^{6,7} The factors contributing to delayed orthopedic surgery often include limited financial resources and inadequate health care insurance coverage.^{6,11-13}

According to the 2019 Philippine National Health Accounts, household out-of-pocket (OOP) payments accounted for 47.9% of the total health expenditure, which is a decrease from 62.1% in 2012. Conversely, government schemes and compulsory contributory health care financing schemes contributed 42% to the current health expenditure in 2019, representing an increase from 27.9% in 2012.^{14,15} The government schemes and compulsory contributory health care financing schemes encompass a range of programs, including domestic revenue-based central government schemes, foreign assistance-based central government schemes, state/regional/local government schemes, and social health insurance schemes.¹⁴

In 2013, the Philippine Health Insurance Corporation (PhilHealth), introduced case rates for various medical conditions and procedures, including those related to femoral shaft fractures, as outlined in PhilHealth Circular No. 0035-2013. For the specific case of femoral shaft fractures, the implemented case rate amounts to Php 30,740.00, covering the procedure cost while excluding the cost of implants.¹⁶ To alleviate the financial burden on patients and ensure that they receive appropriate health care without delay or inadequate treatment, PhilHealth also implemented PhilHealth Circular No. 2016-0020. This circular introduced "Z benefit rates for selected orthopedic implants" (Z-package), which covers both the cost of the surgical procedure for femoral shaft fractures (Php 30,740.00) and the cost of implants (Php 18,000.00) through a case rate.¹⁷ However, not all patients are eligible for this PhilHealth coverage. Patients must first satisfy the eligibility requirements and must also be prepared to complete and submit the necessary documentation in order to receive the Z-package.

We conducted this study to compare the healthcare durations and expenses between patients with closed femoral shaft fractures requiring intramedullary fixation who utilized the Z-package and those who did not.

METHODOLOGY

Setting

We conducted a retrospective cohort study on patients admitted to the Orthopedic Ward of the Southern Philippines Medical Center (SPMC) between January and December 2018. This department typically admits 6-7 adult patients per month for intramedullary nailing of the femur. To qualify for the Z-package, patients with femoral shaft fractures must meet specific criteria. These include having femoral shaft fractures without malignant/metastatic pathological fractures and having any complete fracture of the femur. Furthermore, patients must have been ambulatory before the injury, and their physical status prior to surgery should fall within either ASA I or ASA II categories as defined by the American Society of Anesthesiologists.¹⁷ To establish eligibility, the required documents must be submitted to the designated Z-package Coordinator at the hospital. Subsequently, these documents are forwarded to the SPMC PhilHealth Processor and further reviewed by the Head of the PhilHealth Regional Benefits and Administration Section for approval.¹⁸ Patients who choose not to or are unable to avail the PhilHealth Z-package have alternative options to cover their hospital bills. They can utilize their PhilHealth benefit through the case rate specifically for the femoral shaft fracture surgical procedure. In addition, they can make OOP payments and/or seek applicable financial assistance from other available funds. The sources of other funds for medical assistance (OFMA) include the Lingap Para sa Mahirap funds, Philippine Charity Sweepstakes Office funds, Department of Social Welfare and Development funds, Medical Assistance for Indigent Patients funds, governors' funds, mayors' funds, and SPMC quantified free service funds.

Participants

We included patients aged 19 to 39 years who were admitted for acute trauma with closed fractures of the femoral shaft and who subsequently underwent intramedullary nailing through either open or closed reduction surgery. We excluded patients admitted with multiple traumas.

To determine the minimum sample size for this study, we assumed that the mean length of stay (LOS) of patients who had intramedullary nailing surgery is $36.35 \pm$

21.19 days.¹⁹ Calculations were performed to determine the necessary sample size to detect a 15-day difference in health care duration between two groups of patients based on their Z-package status. In a test for difference of two means carried out at 95% level of confidence, a total sample size of at least 64 will have 80% power of rejecting the null hypothesis if the alternative holds. A total of 93 participants (42 of whom received the Z-package and 53 who did not) were eligible for inclusion in the study. Using a random number generator, we randomly chose 33 patients who received the Z-package (with Z-package group) and 33 patients who did not receive the Z-package (without Z-package group) from the two lists of eligible participants.

Data collection

From the medical records of each patient, we collected data on age, sex, etiology of fracture (road traffic incident, fall, falling object injury), fracture configuration (simple or complex), and type of fracture (transverse, oblique, comminuted, spiral). The study examined various outcomes based on the medical records, including health care durations such as time to surgery (defined as the number of days from admission to the surgical procedure) and length of hospital stay (defined as the number of days from

admission to discharge). Additionally, health care expenses were assessed, including the total hospital bill, PhilHealth coverage, remaining total bill after PhilHealth coverage, OOP expenses, and OFMA coverage.

Statistical analysis

To determine if the continuous variables are normally distributed, we utilized the Shapiro-Wilk test. We calculated medians and interquartile ranges for continuous variables and compared them using the rank-sum test. Categorical variables were reported as frequencies and percentages, and proportions were compared using the chi-square test or Fisher's exact test. A 0.05 two-tailed p-value was considered significant. For all of our statistical tests, we utilized Stata/BE 17.0.

RESULTS

A total of 66 records of patients with closed fractures of the femoral shaft, who were admitted to SPMC and subsequently underwent intramedullary nailing, were included in the analysis of this study. Out of these patients, 33 received the Z-package, while the remaining 33 did not. The baseline characteristics of patients in both groups are shown in Table 1. The two groups were comparable in terms of median age, sex distribution, etiology of fracture distribution,

Table 1 Baseline demographic and clinical characteristics of patients without Z-package versus with Z-package.

Characteristics	Without Z-package n=33	With Z-package n=33	p-value
Age, median years (IQR)	24 (22 to 32)	28 (21 to 31)	0.898
Sex, frequency (%)			0.170
Male	30 (90.91)	26 (78.79)	
Female	3 (9.09)	7 (21.21)	
Etiology of fracture, frequency (%)			0.278
Road traffic accident	27 (81.82)	31 (93.94)	
Fall	5 (15.15)	2 (6.06)	
Falling object injury	1 (3.03)	0 (0.00)	
Fracture configuration, frequency (%)			0.609
Simple	20 (60.61)	22 (66.67)	
Complex	13 (39.39)	11 (33.33)	
Type of fracture, frequency (%)			0.620*
Transverse	12 (36.36)	17 (51.52)	
Oblique	7 (21.21)	4 (12.12)	
Comminuted	13 (39.39)	11 (33.33)	
Spiral	1 (3.03)	1 (3.03)	

IQR=Interquartile range (25th percentile to 75th percentile)

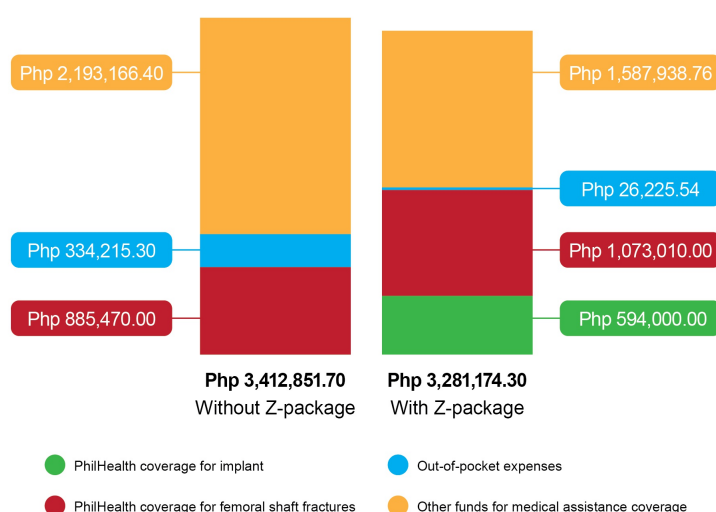
*Fisher's exact test

Table 2 Comparison of health care durations and health care expenses between patients without the Z-package and those with the Z-package.

Characteristics	Without Z-package n=33	With Z-package n=33	p-value
Health care durations			
Time to surgery, median days (IQR)	19 (9 to 30)	24 (17 to 26)	0.156
Length of hospital stay, median days (IQR)	24 (14 to 39)	29 (22 to 30)	0.546
Health care expenses			
Total hospital bill, median Php (IQR)	62,392.00 (50,813.2 to 77,903.00)	62,404.80 (57,159.50 to 91,449.00)	0.314
Total PhilHealth coverage, median Php (IQR)	30,740.00 (30,740.00 to 30,740.00)	48,740.00 (48,740.00 to 48,740.00)	<0.001*
Remaining bill after PhilHealth coverage, median Php (IQR)	39,186.50 (25,432.00 to 70,330.20)	13,664.80 (7,810.20 to 42,709.00)	0.001*
OFMA coverage, median Php (IQR)	49,909.90 (43,190.00 to 66,945.00)	34,409.20 (27,654.26 to 64,340.20)	0.024*
OOP expenses, median Php (IQR)	0.00 (0.00 to 20,000.00)	0.00 (0.00 to 0.00)	0.004*

IQR=Interquartile range (25th percentile to 75th percentile); OFMA=other funds for medical assistance; OOP=out-of-pocket

*significant at p<0.05

**Figure 1** Comparison of breakdown of total expenses incurred by patients with closed fractures of the femoral shaft who underwent intramedullary nailing between those who received the Z-package and those who did not.

fracture configuration distribution, and type of fracture distribution.

Table 2 shows a comparison of health care durations and expenses between patients without the Z-package and those with the Z-package. There was no statistically significant difference in the median days to surgery between patients without the Z-package (19 days; IQR: 9 to 30) and those with the Z-package (24 days; IQR: 17 to 26; $p=0.156$). Similarly, there was no significant difference in the median length of hospital stay between patients without the Z-package (24 days; IQR: 14 to 39) and those with the Z-package (29 days; IQR: 22 to 30; $p=0.546$).

In terms of health care expenses, there was no statistically significant difference in the median total hospital bill between patients without the Z-package (Php 62,392.00; IQR: Php 50,813.20 to Php 77,903.00) and those with the Z-package (Php 62,404.80; IQR: Php 57,159.50 to Php 91,449.00; $p=0.314$). However, the median total PHIC coverage among patients without the Z-package (Php 30,740.00; IQR: Php 30,740.00 to Php 30,740.00) was significantly lower compared to those with the Z-package (Php 48,740.00; IQR: Php 48,740.00 to Php 48,740.00; $p<0.001$).

Furthermore, the median remaining bill after PhilHealth coverage was significantly higher among patients without the Z-package (Php 39,186.50; IQR: Php 25,432.00 to Php 70,330.20) compared to those with the Z-package (Php 13,664.80; IQR: Php 7,810.20 to Php 42,709.00; $p=0.001$). The median OFMA coverage of patients without the Z-package (Php 49,909.90; IQR: Php 43,190.00 to 66,945.00) was also significantly higher compared to those with the Z-package (Php 34,409.20; IQR: Php 27,654.26 to 64,340.20; $p=0.024$). Additionally, patients without the Z-package had a significantly higher median total OOP expense (Php 0.00; IQR: Php 0.00 to Php 20,000.00) compared to those with the Z-package (Php 0.00; IQR: Php 0.00 to Php 0.00; $p=0.004$).

Figure 1 provides a breakdown of the total expenses incurred by all patients included in this study, comparing those without the Z-package to those with the Z-package. The aggregate total bill of patients in the without Z-package group was Php 3,412,851.70, while that of patients with the

Z-package was Php 3,281,174.30. Among the 33 patients with the Z-package, the sum of expenses for the implants covered by PhilHealth amounted to Php 594,000.00, which accounted for 18.10% of the total hospital bill of the patients in this group. Patients without the Z-package had a PhilHealth coverage sum of Php 885,470.00, while patients with the Z-package had a coverage sum of Php 1,073,010.00.

Out of the aggregate total bills, Php 2,527,381.70 and Php 1,614,164.30 were not covered by PhilHealth for patients without the Z-package and with the Z-package, respectively. Among patients without the Z-package, 13.22% of the remaining expenses after PhilHealth coverage were paid out-of-pocket, while the remaining 86.78% was covered through OFMA. In contrast, patients with the Z-package only paid 1.62% of the remaining expenses after PhilHealth coverage out-of-pocket, with the remaining 98.38% covered through OFMA.

DISCUSSION

Key results

In this study, there were no statistically significant differences in the medians for days to surgery, length of hospital stay, and total hospital bill between patients without Z-package and those with Z-package. Patients without the Z-package had a significantly lower median total PhilHealth coverage compared to those with the Z-package. However, patients without Z-package had significantly higher medians for remaining bill after PhilHealth coverage, OFMA coverage, and OOP expenses compared to those with Z-package.

Strengths and limitations

This study compared health care durations and expenses between patients who received the Z-package and those who did not. The findings provide valuable insights into the importance of a national health insurance program in meeting the specific needs of patients with femoral fractures who lack financial resources. Understanding the gaps in the delivery of services by PhilHealth can guide policy development for both hospitals and PhilHealth, leading to improvements in the care provided to patients with femoral fractures.

However, there were certain limitations in this study. Clinical outcomes such as

morbidity were not assessed, even though the development of morbidity during a patient's hospital stay can significantly impact health care durations and expenses. Additionally, the estimation of OOP expenses may have been underestimated as we relied solely on medical records, which may not capture expenses incurred for purchasing medications and other supplies outside the hospital. Finally, patients in this study only came from a single tertiary government hospital. The inclusion of patients admitted to private hospitals could have enhanced the accuracy of the data, as they may have different health financing schemes compared to those admitted to public hospitals like SPMC.

Interpretation

The enrollment in the Z-package is expected to reduce the financial burden on patients through shorter hospital stays, facilitating an early return to work and alleviating the economic strain experienced by the patient.¹⁷ Moreover, the reduction in hospital stays promotes the efficient utilization of hospital resources, leading to improved resource management. However, in our study, we observed a 5-day delay in surgery among patients who enrolled in the Z-package compared to those without the Z-package. A contributing factor to this delay is the processing time required for the Z-package application. Once all documentary requirements are completed, these documents need to undergo screening and approval by various offices within the hospital.¹⁸ Other factors such as availability of the operating room, availability of blood products, and medicines in the hospital may also contribute to the increased time to surgery. Successive days in surgical delays have been associated with poorer patient outcomes.^{6, 20} The 5-day delay in surgery may result in a higher odds of overall complications to patients.

While patients in both groups had similar total hospital bills, there were differences in how these bills were settled by the patients in this study. Patients without the Z-package incurred the cost of implants and other hospitalization expenses either through OOP payments or by seeking financial assistance from other available funds designated for medical assistance. A large proportion of the remaining hospital bill after PhilHealth coverage was covered by OFMA, effectively

reducing OOP expenses for patients. This highlights the vital role of OFMA, which is provided by various government agencies, in alleviating health care costs for patients. Furthermore, patients with the Z-package received a higher percentage of OFMA coverage for the remaining bill after PhilHealth coverage, indicating their willingness, or that of their family members, to actively pursue OFMA coverage.

Generalizability

The findings of this study are applicable to a majority of patients with closed fractures of the femoral shaft who underwent intramedullary nailing, specifically in a public tertiary hospital setting. However, it is important to note that conducting the same study in a private hospital setting may yield different results, particularly in terms of health care expenses. This is due to the inclusion of for-profit providers in the private sector, which may have varying cost structures and financial considerations.²¹

Contributors

ABVA, MLBL and MEAC had substantial contributions to the study design, and to the acquisition, analysis and interpretation of data. ABVA wrote the original draft and subsequent revisions, and reviewed, edited, and approved the final version of the manuscript. All authors agreed to be accountable for all aspects of the work.

Acknowledgments

We would like to thank Ms Joy Cubero, Department of Orthopedics Z-package coordinator in Southern Philippines Medical Center, for providing the data used in this study.

Ethics approval

This study was reviewed and approved by the Department of Health XI Cluster Ethics Review Committee (DOH XI CERC reference P19031301).

Reporting guideline used

STROBE Checklist (http://www.strobestatment.org/fileadmin/Strobe/uploads/checklists/STROBE_checklist_v4_combined.pdf)

Article source

Submitted

Peer review

External

Funding

Supported by personal funds of the authors

Competing interests

None declared

Access and license

This is an Open Access article licensed under the Creative

Commons Attribution-NonCommercial 4.0 International License, which allows others to share and adapt the work, provided that derivative works bear appropriate citation to this original work and are not used for commercial purposes. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc/4.0/>.

CONCLUSION

This retrospective cohort study showed that patients with the Z-package experienced a slightly longer time to surgery compared to those without, but the difference was not statistically significant. However, patients who utilized the Z-package had a significantly lower remaining bill after PhilHealth coverage and incurred significantly lower OOP expenses compared to those without Z-package coverage.

Commons Attribution-NonCommercial 4.0 International License, which allows others to share and adapt the work, provided that derivative works bear appropriate citation to this original work and are not used for commercial purposes. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc/4.0/>.

REFERENCES

1. Kramer E, Shearer D, Marseille E, Haonga B, Ngahyoma J, Eliezer E, et al. The Cost of Intramedullary Nailing for Femoral Shaft Fractures in Dar es Salaam, Tanzania. *World J Surg*. 2016 Mar 16;40.
2. Genuino KAF, Bautista JMD. Effect of a Consignment Policy on Outcomes of Orthopedic Emergency Trauma Patients in a Tertiary Hospital. *Acta Medica Philippina*. 2022;56(20):12-17.
3. Singaram S, Naidoo M. The physical, psychological and social impact of long bone fractures on adults: A review. *Afr J Prim Health Care Fam Med*. 2019 May 30;11(1):e1-e9.
4. Griffiths EJ, Cash DJ, Kalra S, Hopgood PJ. Time to surgery and 30-day morbidity and mortality of periprosthetic hip fractures. *Injury*. 2013 Dec;44(12):1949-52.
5. Liu Z, Du Z, Lu H, Fu Z, Xu H. Delay between admission and surgery as a potential risk factor for postoperative morbidity and mortality in elderly patients with hip fractures: A retrospective study. *J Orthop Sci*. 2022 Aug 25:S0949-2658(22)00191-9.
6. Ryan DJ, Yoshihara H, Yoneoka D, Egol KA, Zuckerman JD. Delay in Hip Fracture Surgery: An Analysis of Patient-Specific and Hospital-Specific Risk Factors. *J Orthop Trauma*. 2015 Aug;29(8):343-8.
7. Meng D, Bai X, Wu H, Yao S, Ren P, Bai X, Lu C, Song Z. Patient and Perioperative Factors Influencing the Functional Outcomes and Mortality in Elderly Hip Fractures. *J Invest Surg*. 2021 Mar;34(3):262-269.
8. Ergin ÖN, Bayram S, Anarat FB, Yağcı TF, Balcı Hİ. Prognostic factors affecting survival of patients with intertrochanteric femoral

- fractures over 90 years treated with proximal femoral nailing. *Eur J Trauma Emerg Surg.* 2020 Jun;46(3):663-669.
9. Khan H, Khoriat AA, Lazic S, Navein J, Sharma R, Ellahee N. The effect of time to surgery in neck of femur fracture patients with ASA Grade of 3 and above. *Hip Int.* 2022 Mar;32(2):276-280.
 10. Dhingra M, Goyal T, Yadav A, Choudhury AK. One-year mortality rates and factors affecting mortality after surgery for fracture neck of femur in the elderly. *J Midlife Health.* 2021 Oct-Dec;12(4):276-280.
 11. Flores JD. Factors Affecting the Length of Hospital Stay of Patients with Femoral Fracture Admitted at Orthopedic Ward from June to September 2011. *Health Research and Development Information Network.* Available from: <https://www.herdin.ph/index.php/component/herdin/?view=research&cid=55024>.
 12. Sheehan KJ, Sobolev B, Villán Villán YF, Guy P. Patient and system factors of time to surgery after hip fracture: a scoping review. *BMJ Open.* 2017 Aug 21;7(8):e016939.
 13. Gitajn IL, Werth P, Fernandes E, Sprague S, O'Hara NN, Bzovsky S, Marchand LS, Patterson JT, Lee C, Slobogean GP; PREP-IT Investigators. Association of Patient-Level and Hospital-Level Factors With Timely Fracture Care by Race. *JAMA Netw Open.* 2022 Nov 1;5(11):e2244357.
 14. Philippine Statistics Authority. Philippine National Health Accounts Report 2014-2019. Quezon: Philippine Statistics Authority. 2020 Oct 15. Available from: <https://bit.ly/3rbCMNv>.
 15. Racelis RH, Dy-Liacco FVN, David LC, Nievera LF. Health Accounts Estimates of the Philippines for CY 2012 Based on the 2011 System of Health Accounts. *Philippine Journal of Development.* 2016;41-42(1-2). Available from: https://pidswebs.pids.gov.ph/CDN/PUBLICATIONS/pidspid14-15_healthaccounts.pdf.
 16. Philippine Health Insurance Corporation. ACR POLICY NO. 2 — Implementing guidelines on medical and procedure case rates, Philhealth Circular No. 0035 Series 2013 (2013 Nov 15).
 17. Philippine Health Insurance Corporation. Z benefit rates for selected orthopedic implants (Revision 1), Philhealth Circular No. 2016-0020 (2016 Jun 30).
 18. Philippine Health Insurance Corporation. The guiding principles of the Z benefits (Revision 1), Philhealth Circular No. 2021-0022 (2021 Nov 24).
 19. Mustafa Diab M, Shearer DW, Kahn JG, Wu HH, Lau B, Morshed S, et al. The Cost of Intramedullary Nailing Versus Skeletal Traction for Treatment of Femoral Shaft Fractures in Malawi: A Prospective Economic Analysis. *World J Surg [Internet].* 2019;43(1):87-95.
 20. Liu Z, Du Z, Lu H, Fu Z, Xu H. Delay between admission and surgery as a potential risk factor for postoperative morbidity and mortality in elderly patients with hip fractures: A retrospective study. *J Orthop Sci.* 2022 Aug 25:S0949-2658(22)00191-9.
 21. Ministry of Foreign Affairs. Health Care in the Philippines. 2021 Apr. Available from: <https://www.rvo.nl/sites/default/files/2021/06/Healthcare-in-The-Philippines.pdf>.

Southern Philippines Medical Center Journal of Health Care Services Editors

Editor in Chief: Alvin S Concha • **Associate Editors:** Christine May Perandos-Astudillo, Rodel C Roño, Melivea I Melgazo, Seurinane Sean B Española

Managing Editor: Clarence Xlasi D Ladrero • **Layout Editor:** Clarence Xlasi D Ladrero

SPMC JHCS OFFICE Research Utilization and Publication Unit, Acacia Room, Level 3 Outpatient Building, Southern Philippines Medical Center, JP Laurel Avenue, Davao City, Philippines
Landline (+6382) 2272731 loc 4127 • **Website** www.spmcjjournal.com • **Email** spmcjournals@gmail.com