Original Article

Per Capita Health Expenditure at a Municipal Hospital: Perspective from a General Practice Hospital in Rural Nepal

Pawan Kumar Bajaj Agrawal[1], Baburam Giri[2], Priyanka Gupta[3], Anjan Nepali[4], Suraj Parajuli[5]

[1]Senior Consultant, Citycare Hospital, Bardibas, Nepal
[2]Administrative Officer, NepalMed e.v., Nepal
[3]Consultant, Bluecross Hospital, Kathmandu, Nepal.
[4]Medical Officer, Amppipal Hospital.
[5]Associate Professor, Medical University of the Americas Nevis, West Indies.

Corresponding Author: Dr. Pawan Kumar Bajaj Agrawal;
Email: agrawal.pawan@hotmail.com ORCID: https://orcid.org/0000-0003-3712-7382

ABSTRACT

Background: The Government of Nepal has been strengthening the primary care and fulfilling the commitment of universal health coverage by upgrading and establishing municipal hospitals. These hospitals are expected to be affordable and accessible. It is necessary to understand the health expenditure at these primary centers to reflect upon the productivity, especially in low income countries like Nepal struggling with adequate expenditure in health. Therefore, we aimed to reflect upon the temporal trend of per capita health expenditure in a rural municipal hospital.

Methods: The descriptive combined cross-sectional study was conducted in Amppipal Municipal Hospital, in rural Gorkha with catchment population of 37,409, over duration of five fiscal years. Yearly records of expenditure and total number of clients were used to infer per capita expenditure. The total number of emergency patients, inpatients and surgeries performed were documented in order to reflect upon their impact.

Result: The total annual clients visiting the hospitals increased over the years from 19,062 in FY 2017/18 to 28,249 in FY 2021/22. The median contribution of emergency patients and admitted patients among total clients over the years was 3.1% and 5.2% respectively. Surgeries, including minor ones, were performed in 3.7% of the total yearly clients.The per capita expenditure increased from NPR 1,217 in FY 2017/18 (USD 9.3) to NPR 1,438 (USD 11.0) in FY 2021/22, one United States dollar being equivalent to one hundred and thirty Nepali rupees. The median per capita expenditure was NPR 1,303 (USD 13.0).

Conclusion: Our study suggested the increasing trend of per capita health expenditure over five years duration in a primary care municipal hospital in Nepal, with overall increase of 18.15%. The study would be helpful in budgeting and evaluating the productivity of these primary care institutions.

Keywords: general practice; municipal hospital; Nepal; per capita health expenditure; primary care.

Article Information

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INTRODUCTION

Municipal hospitals are the nearest point of contact after health posts for most patients who need some type of investigations, including laboratory investigations and imaging such as x-rays or ultrasound, admissions and minor or major surgeries [1]. These primary care centers have an important role in screening, early diagnosis, treatment of diseases and reduction of complications with disease aggravation. These centers are expected to be most affordable & accessible among all the three tiers of hospitals [2-4]. Hence, it is inevitable to strengthen these hospitals with leadership of general practitioners (GPs) and thereby increase efficiency & effectiveness of health expenditure at these centers [4-6].

Strengthening of primary care hospitals, however, requires considerable budget. The government has been trying hard to operate municipal hospitals in each of the municipalities. There are 753 municipal hospitals in the country, some of which are being funded and run effectively while others struggle with problems of human resource, equipments and building infrastructure following inadequate planning [1,4]. These hospitals in Nepal have mixed financing mechanism owing to roll-out of national health insurance program throughout the country under Government of Nepal since 2016 [7,8]. Very few studies have estimated the pattern of cost of health care delivery at these primary care centers. Till date, there is no formal framework to assess the primary health care expenditure and productivity in Nepal [9,10].Hence we aimed to study the temporal trend of per capita health expenditure at a primary care municipal hospital being run with a general practitioner and pattern of institutional expenditure under different sub- categories.

METHODOLOGY

This was a descriptive combined cross-sectional study in Amppipal Hospital, Gorkha over the duration of five fiscal years (FY) from July 2017 to June 2022. Amppipal Hospital is a primary care municipal hospital in rural Gorkha as per recent national categorization of government healthcare institutions with catchment population of 37,409 as per census of 2021[11].It is a hospital with 50 beds operational capacity hospital and a team of three medical officers under the leadership of a senior consultant general practitioner(GP) formally recognized as a medical generalist. It is a comprehensive emergency obstetric and neonatal care center, also providing general orthopedic and surgical care services, basic dental care, ophthalmology care and physiotherapy services to fulfill the community health needs. And all the referrals are supervised by the GP. The total number of hospital employees is 52.The hospital is situated almost 15 kilometers far from the dense settlement and on the other side of the exit point of the municipality. The nearest referral center is at the distance of three hours' drive. The referral rate from the outpatient department of the hospital was almost 2.9% [4]. Approval was obtained from the hospital administration to access the necessary data for this study.

The data about outpatient, admitted and emergency clients was obtained from hospital records. Since the hospital could provide medicines for maximum of one month duration, there were monthly visits of chronic disease patients. Multiple visits of the same patients were considered as multiple patients. The single patient might visit the facility for one problem in one visit and for another problem in another visit or for longitudinal care in case of chronic diseases. This enables to have a better insight about the cost incurred in each visit. And hence per capita expenditure from institutional perspective approximated the amount of per patient per visit expense at hospital and included direct costs related to treatment of illness and appreciated by patients (human resource, diagnostics and treatment) and indirect costs that

were not apprehended during treatment but were essential part of healthcare delivery (administration, fuel, repair & maintenance and capital expenditure). Since the surgical care cost is significantly higher than general medical care, the burden of surgical care was also described. The surgeries were classified as major and minor. All the surgeries that required ketamine sedation or spinal anesthesia were considered as major and rest of the surgeries were grouped as minor. Per capita health expenditure was calculated by dividing the entire institutional expenses of the particular year with the total number of patient visits

The financial data was collected from the finance section of the hospital. The health institutions needs to meet up with sustainable and feasible care necessities of the clients which requires continuous investment in building infrastructures and equipments. Hence, the total annual expenditure including capital & operational expenses was essential to gain insights of expenses incurred at hospital end to provide the necessary services. The expenditure was classified into six categories namely human resource (HR), medicine & consumables, fuel & electricity, repair & maintenance, charity, administrative expenses and capital expenditure. Patient food cost for admitted patients and depreciation of buildings and equipments was not taken into consideration for expenses. Human resources consisted for salary, allowances and overtime benefits. Medicine & consumables included medical and surgical items whereas repair & maintenance consisted of daily wages, repairing parts and housekeeping items. Administrative expenses involved stationery items, meeting allowances and travel expenses. The investment in building new infrastructure and in procuring new equipments and instruments was classified as capital expenditure. The financial data was collected by an administrator with more than 10 years of experience in hospital administration. He was provided a clear description of content of above sub-categories.

The statistical analysis was performed using Microsoft Excel 2013 (Microsoft Corporation, Redmond, Washington, USA). The categorical variables were expressed in numbers and percentages. Normal distribution of data was determined graphically using histogram. Normally distributed data was presented in terms of mean, and median was used to present the continuous variables not fulfilling the criterion of normal distribution.

RESULT

The number of total clients visiting the hospitals increased over the years from 19,062 in FY 2017/18 to 28,249 in FY 2021/22.The median percentage of emergency patients among total clients over the years was 3.1% with inter-quartile range (IQR) of 3.6-3.1. Similarly, the median percentage of admitted patients among total clients was 5.2% with inter-quartile range of 5.0-5.8. Around 3.7% of total yearly clients underwent some form of surgeries with IQR of 3.6-4.1 and 3.2% of total yearly clients underwent minor surgeries with IQR of 3.2-3.6.The median number and percentage of major surgery per year was 120 (0.5%).

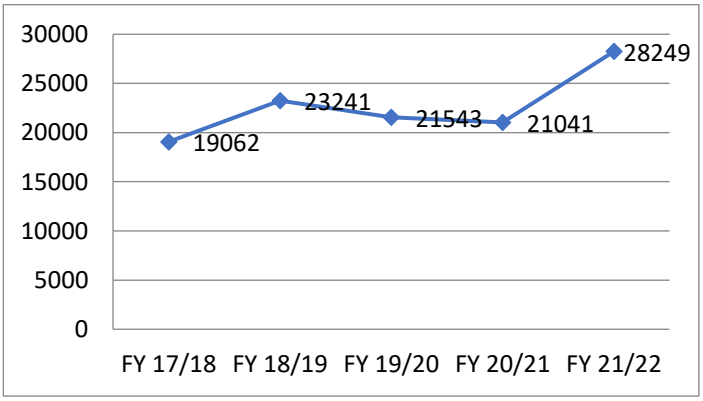

Figure 1. Trend of total number of clients over five fiscal years.

The total annual expenditure increased from NPR 23 million (USD 176,923) in FY 2017/18 to 40 million (USD 307,692) in FY 2021/22, considering the exchange rate of one United States dollar as one hundred and thirty Nepali rupees. The median per capita expenditure over the years was NPR 1,303 (USD 10.0) with IQR of

1,217-1,438. The per capita expenditure increased over the duration of five years with overall increment of 18.15%. The expenditure in human resource and medicine & consumables accounted for majority of annual expenses.

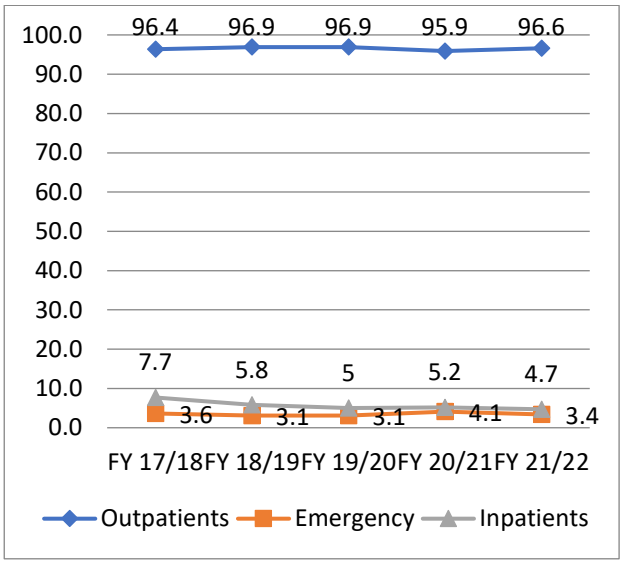

Figure 2. Percentage distribution of clients in each of the departments

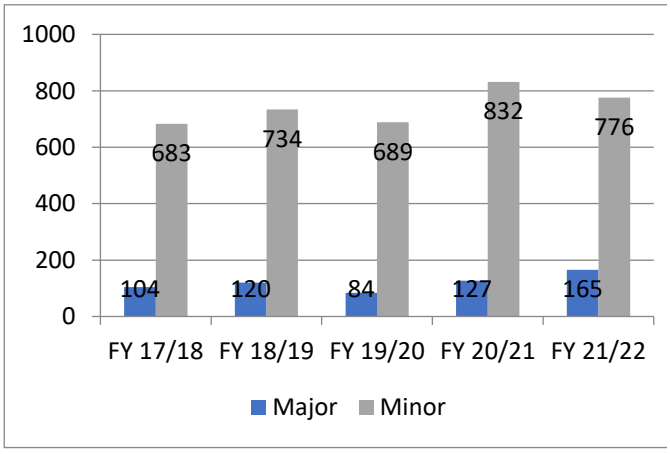

Figure 3. Number of clients undergoing surgery

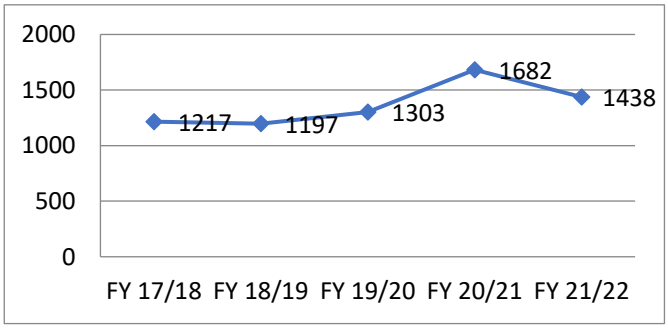

Figure 4. Trend of per capita expenditure over five fiscal years in Nepali rupees

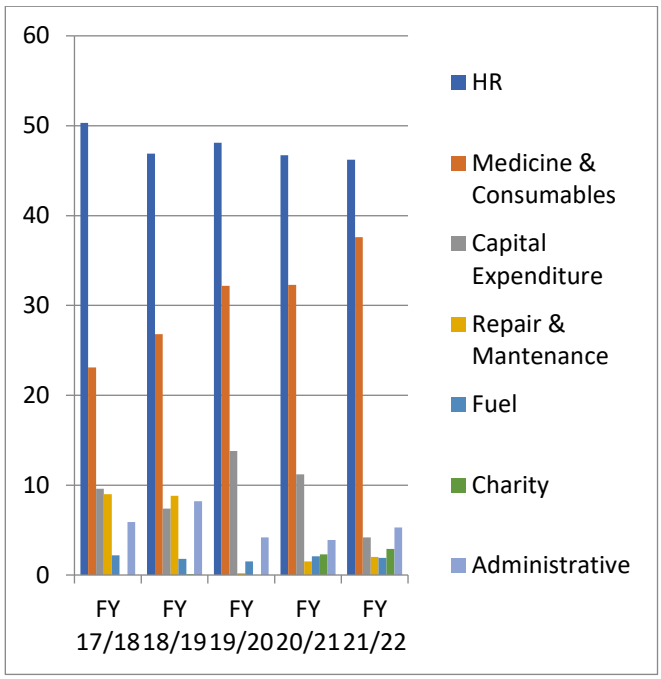

Figure 5. Percentage of expenditure under different sub-categories every year

DISCUSSION

The number of patients visiting the hospital increased over the duration of study. Since the municipal hospitals are accessible & affordable, patients usually seek health care at nearest municipal hospitals [1,12].There are numerous internal and external factors that influence the number of patients visiting these municipal hospitals. The number of clients is determined by the availability of medical professionals, diagnostics, treatment opportunities and insurance friendliness. Amppipal had adequate staffing with 52 personnel and ensured 24 hour emergency services with comprehensive medical and surgical care under supervision of a GP. Problems with repair and maintenance of diagnostic equipment and subsequent interruption of services were minimal. Amppipal had been putting its best efforts to be insurance friendly and improve patient experience. The patients had to verify their insurance amount once during registration of visit and they did not have to pay any additional amount if they were insured. However, the hospital was comparatively less accessible. It was located around 15 kilometers far from the densely populated area of the municipality, on the other side of exit of the

municipality. Public transportation for the hospital was not available and the hospital operated a community bus for ease of the clients. However, some municipal hospitals might have significantly increased footfalls compared to Amppipal. Schwartz et al had observed that a rural municipal hospital served around one hundred thousand patients in a year because of their accessibility, considerable distance of eight hours drive from the referral center and affordability with zero fees. [6,12].

The percentages of emergency visits (3.1%) and admitted patients (5.2%), however, differ from other studies in similar settings. These studies concluded that percentage of emergency visits ranged from 5.5% to 20% and that of admissions ranged from 3% to 7.6% [6,9]. Quality care from outpatient departments and effective preventive and promotive health service might have decreased the number of emergency visits & inpatient admissions [13]. Also, majority of emergency visits in municipal hospitals could be trauma, where the patients preferred orthopedic opinion over a GP in Amppipal and seek care at higher centers. The GPs in these municipal hospitals had to use all the available diagnostic services including ultrasound in order to ensure quality of service and good patient experiences, thereby decreasing the need of referrals. GPs in Nepal are equipped with wide range of surgical skills on top of medical skills. That's why they are preferred in these municipal settings which cannot afford a number of other specialties like internal medicine, general surgery, pediatrics, orthopedics and anesthesia [5,6]. The medical cases, unless in intensive care, have lower costs compared to surgical cases. Hence, number of surgeries has direct implications upon the total health expenditure and onto per capita expenditure [4,14].

Per capita health expenditure (PCE) could be one of the parameters to assess the care delivery effectiveness and efficiency along with several other parameters [4, 16]. In our study, net PCE has increased overtime by almost 18%. However, a peak was noted in FY 20/21 following which there was decline in PCE. The possible reason would be the change of practicing GP in the institution and installation of electronic health record (EHR) system. The medical leadership could have brought changes in the treatment protocols including increased utilization of diagnostic services like laboratory and imaging investigations and availability of expensive medicines in the hospital pharmacy. With the implementation of EHR, the clinicians had to perform the baseline or routine laboratory investigations for EHR records to improve longitudinal care in chronic disease patients. PCE provides insight to the overall cost of running these municipal hospitals in accordance with the commitment of universal health coverage.

Understanding of PCE has several advantages. Considering a chronic disease patient of diabetes or hypertension visited the hospital every month, the total direct cost per patient per year as per our study could be estimated as NPR 15,363 (USD 118.17) which was in accordance with the findings of other studies estimating the cost of management of chronic disease in the country [16,17]. This further implies that the current health insurance coverage of NPR 100,000 for a family of five under national health insurance board might be sufficient provided there is access to quality primary care services [8].

The investment in human resource was highest followed by medical & surgical items, capital expenditure, administrative expenses, repair & maintenance, fuel & electricity and charity. Silwal et al had also shown that expenditure in human resource was highest in annual budget of similar hospitals [9]. However, the necessary investment in human resource depends upon the accessibility and extent of development in the respective municipalities. Accessible and urbanized municipalities have higher supply of human resources subsequently decreasing the cost. It is possible to decrease PCE to certain extent by making necessary efforts in quality care delivery and better patients' experiences to increase the number of patients. The high human resource cost and indirect costs

of administration, fuel, repair and maintenance and capital expenditure would be distributed among higher number of patients creating a significant decrease in PCE.

A general perception is surgical care costs are significantly higher than general medical care. PCE would be higher for surgical care than general medical care. Hence, the municipal hospitals performing higher number of surgeries would have higher PCE. Though, the study reflected upon the extent of available surgical care, the concept of per capita expenditure would have been better if the study had segregated non-surgical cases from the surgical ones. More studies are required to compare and conclude cost effectiveness in our primary care. This study would help health system administrators and policy makers in better understanding the cost of primary care delivery and planning of municipal hospitals.

CONCLUSION

Our study suggested the increasing trend of per capita health expenditure in a municipal hospital in rural Nepal with overall increase of 18.15% in five years duration. The study reflected the increased trust and subsequently increased footfalls over the years. Municipal hospitals have been envisioned as first point of contact for bolstering primary health care. The study would be helpful in budgeting and evaluating the productivity of these primary care centers, determining the cost of longitudinal care in non-communicable diseases and assessing the financial adequacy of government health insurance program. Per capita health expenditure might be a useful tool to assess overall effective utilization of financial resources in primary care.

Layman summary:

Strengthening of primary care municipal hospitals has financial implications. The government has been planning to operate municipal hospitals in each of the 753 municipalities. Very few studies have estimated the pattern of cost of health care delivery at these primary care centers. Till date, there is no formal framework to assess the primary health care expenditure and productivity in Nepal. Hence we aimed to study the temporal trend of per capita health expenditure at a primary care municipal hospital being run with a general practitioner. The study would be helpful in budgeting and evaluating the productivity of these primary care centers. Per capita health expenditure might be a useful tool to assess overall effective utilization of financial resources in primary care.

Conflict of interest: None.

Data Availability Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request

Ethical Approval:

Received from the hospital administration of Amppipal Hospital on 7th April 2024 with reference no. 158

Author Contributions:

PKBA, BG and PG conceptualized and designed the research; PKBA, BG and AN collected the necessary data and performed necessary analysis; PKBA and SP drafted the manuscript; all authors reviewed the manuscript and approved the final version. All authors agreed to be accountable for all aspects of the research work.

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REFERENCES

1. Wasti SP, Van Teijlingen E, Rushton S, Subedi M, Simkhada P, Balen J. Overcoming the challenges facing Nepal's health system during federalisation: an analysis of health system building blocks. Health Res Policy Syst. 2023 Nov 2;21(1):117. https://doi.org/10.1186/s12961-023-01033-2 [PubMed] [Full Text]
2. Lee H, Jo H, Karmacharya BM, Sharma B, Shrestha P, Satyal P, Nam EW. Factors affecting Nepalese rural dwellers' choice of first-contact health facility: a cross-sectional survey. J Glob Health Rep. 2023 May 16;7. https://doi.org/10.29392/001c.75143 [Full Text]
3. Adhikari B, Mishra SR, Schwarz R. Transforming Nepal's primary health care delivery system in global health era: addressing historical and current implementation challenges. Global Health. 2022 Jan 31;18(1):8. https://doi.org/10.1186/s12992-022-00798-5 [PubMed] [Full Text]
4. Agrawal PK, Gupta P, Parajuli S. Referral situation from a municipal hospital with general practitioner: a cross-sectional study: Referral situation from a municipal Hospital. J Gen PracEmerg Med Nepal. 2023 Aug 30;10(15):13-7. https://doi.org/10.59284/jgpeman215 [Full Text]
5. Dangal B, Pathak M, Gauchan B, Khadka MB, NG JY. Role of general practitioners in transforming surgical care in rural Nepal-a descriptive study from Eastern Nepal. J Gen PracEmerg Med Nepal. 2021 Jul 14;8(11):5-9. [Full Text]
6. Gauchan B, Mehanni S, Agrawal P, Pathak M, Dhungana S. Role of the general practitioner in improving rural healthcare access: a case from Nepal. Hum Resour Health. 2018 Dec;16:1-8. https://doi.org/10.1186/s12960-018-0287-7 [PubMed] [Full Text]
7. Khanal GN, Bharadwaj B, Upadhyay N, Bhattarai T, Dahal M, Khatri RB. Evaluation of the National Health Insurance Program of Nepal: are political promises translated into actions?. Health Res Policy Syst. 2023 Jan 20;21(1):7. https://doi.org/10.1186/s12961-022-00952-w [PubMed] [Full Text]
8. Nepal Health Research Council. Towards Universal Health Coverage: Addressing Financial Hardship and Improving Access to Healthcare in Nepal (Policy brief). Kathmandu: Nepal Health Research Council. 2022. Available from: https://nhrc.gov.np/wp-content/uploads/2023/04/Policy-brief-Towards-Universal-Health-Coverage.pdf
9. Silwal PR, Ashton T. Productivity of public hospitals in Nepal: a data envelopment analysis. BMJ Open. 2017 Jul 1;7(7). https://doi.org/10.1136/bmjopen-2016-015327 [PubMed] [Full Text]
10. Maele NV, Xu K, Soucat A, Fleisher L, Aranguren M, Wang H. Measuring primary healthcare expenditure in low-income and lower middle-income countries. BMJ Glob Health. 2019 Mar 1;4(1). https://doi.org/10.1136/bmjgh-2019-001497 [PubMed] [Full Text]
11. Ministry of Health, Nepal. Categorization of health facilities as per health infrastructure development standards 2074 (BS).Kathmandu, Ministry of Health & Population; 2017. 33p. [Full Text]
12. Schwarz R, Nepal P, Acharya B, Adhikari SR, Aryal A, Basnett I, et al. Expenses and national insurance payments at a municipal-level hospital in rural Nepal: implications for strategic purchasing and universal health coverage. 2020 Jan 8: Preprint (Version 1). Available from: https://www.researchsquare.com/article/rs-10938/v1
13. Huang PT, Kung PT, Kuo WY, Tsai WC. Impact of family physician integrated care program on decreasing utilization of emergency department visit and hospital admission: a population-based retrospective cohort study. BMC Health Serv Res. 2020 Dec;20:1-9. https://doi.org/10.1186/s12913-020-05347-7 [PubMed]
14. Fleming M, King C, Rajeev S, Baruwal A, Schwarz D, Schwarz R, et al. Surgical referral coordination from a first-level hospital: a prospective case study from rural Nepal. BMC Health Serv Res. 2017 Dec;17:1-8. https://doi.org/10.1186/s12913-017-2624-2 [PubMed] [Full Text]
15. Quality Standards and Regulation Division, Ministry of Health and Population. Minimum service standards: checklist to identify the gaps in quality improvement of primary hospitals. Kathmandu, Ministry of Health & Population; 2018. [Full Text]
16. Shrestha R, Shakya A. Health expenditure among the outpatient of type-2 diabetes in selected hospital of Kathmandu district: A cross sectional study. medRxiv. 2021 Jun 1:2021-05. https://doi.org/10.1101/2021.05.27.21257843 [Full Text]
17. Kattel V, Subedi M, Agrawal Y, Pall ZS, Rani S, Upadhyaya S, et al. Cost of illness study of regular out patient department diabetic in a low income country: a cross sectional study. J Diabetes Endocrinol Nepal. 2019 May 26;3(1):16-25. https://doi.org/10.3126/jdean.v3i1.24060 [Full Text]