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Women Literacy and Health Outcomes Inequality in Nepal

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Abstract

This article assesses the women literacy and health outcome inequality in Nepal. The study attempted to assess the nexus between women literacy and some key health outcomes based on provincial level data of Nepal. Basically the study follows the descriptive analysis with explanatory design under quantitative research based on the secondary data from ministry of health and population of Nepal (2017). Statistical analysis of provincial wise key health outcome data was done using chi-square test of the goodness of fit to ensure evidence of inequality of the health outcome across the provinces of Nepal. Likewise, to find the causal relationship between women literacy rate (WLR) and institutional delivery rate (ID), contraceptive prevalence among married women (CPMW), child immunization rate (CIR), ANC (Antenatal Care) service receive by women (ANCRW), teenage pregnancy rate (TPR), total fertility rate (TFR) in seven provinces was observed using correlation and regression analysis tool. The result of chi-square test shows that there could be observed inequality in WLR and ID. Likewise, correlation analysis shows that there is positive correlation between WLR and ID, WLR and CPMW, and WLR and ANCRW but there is negative relation between WLR and CIR, WLR and TPR, WLR and TFR. The regression analysis shows that there is significant relationship among the variables WLR and ID, ANCRW, TPR, TFR. Therefore, it can be concluded that it is essential to increase women literacy to bring improvement in aforementioned key health outcomes. The implication of the study will help to make effective public health policy and strategy to reduce the equity gaps in health outcomes in Nepal.

Keywords: Women Literacy, Health Outcomes, Inequality, Province

Introduction

Literacy refers to the ability to read and write at a level whereby individuals can effectively understand and use written communication in all media including digital literacy (Montoya, 2018). Furthermore, Acharya and Robinson-Pant (2017) indicate that women's literacy has been a policy focus in Nepal for many decades. In the same way, many international organizations' (UNESCO, 2013) reflection shows that women's literacy has been associated with enhanced health outcomes for instance, educated mothers are more likely to have their children vaccinated, adopt

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family planning methods. Another study highlights that women's health status and their level of education positively correlates with health outcomes (Alejos, 2015). In this paper, it is observed that whether the women's literacy has significant relation with health status in a same manner or not.

National Demographic and Health Survey (NDHS, 2016) has prioritized the basic health facilities for the people in community level. Among various key health indicators in that survey, this article sets out major seven indicators such as: institutional delivery rate (ID), contraceptive prevalence among married women (CPMW), child immunization rate (CIR), antenatal care (ANC), antenatal service receive by women (ANCRW), teenage pregnancy rate (TPR), total fertility rate (TFR). Likewise the study tries to find the relation between the women literacy rate (WLR) with these seven key health indicators in provincial level of Nepal.

The governance system of Nepal has restructured through the promulgation of new constitution of Nepal (2015). This new constitution has introduced three tiers of governments: federal, provincial and local for equal access of the people on government services. Administratively Nepal is divided into seven provinces and seven hundred fifty three local governments. Federal government has transferred the power authority and resources to the province and local government for the development activities as well as health. Health sector is closely related to human development indicators. The state restructuring scenario has also influenced the health governance in Nepal. Now the health governance scenario as seen as like, Ministry of Health and Population (MoHP) at the central level and Ministry of Social development at provincial level and the health department at the local government level (Khanal & Mishra, 2019). The health system of Nepal is guided by constitution (2015), National Health Policy (2014) and Nepal Health Sector Strategy 2015-2022. The federal governance system has great opportunities to implement the health sector reform with high priority as the key indicators of development.

NDHS (2016) has conducted by the MoHP periodically and the report prevailed the fact and figure of health sector of Nepal. We can observe the variation among the seven provincial indices in health sector of Nepal. Basic health facilities and awareness level of the people is significantly unequal in the provincial as well as rural and urban sector. There should be equity in the health governance policy and strategy to response the unequal health status in provincial level. Although over two decades, Nepal has improved people's access to health care by expanding health services and strengthening community-based interventions (MoHP, 2017). However, it is not great achievement, a comprehensive action oriented health sector federal strategy is essential to reduce the provincial demographic disparities.

Health is key indicator of development. Nepal has been improving some basic health indicators such as maternal health, child mortality, vaccination coverage,

combat HIV/AIDS, malaria last couple of decades among south Asian countries. Although it is not enough, Nepal demographic health survey (2016) indicates that still there is the variation between provincial level in the basic health facilities and indicators in federal Nepal. A scholarly research on HDI projection among provincial level of Nepal is presented that the performance basically depends on level of socio-economic development of the particular area (Dhungel, 2018). The estimation shows that in 2016 Province Province1, Bagmati, Gandaki and Lumbini surpass national average and ensure strong presence in medium HDI group. Madesh and Sudurpashchim reach in border line of medium range while Province lags behind in comparison to 2016. The study of Multidimensional Poverty Index (MPI, 2018) report has identified the socio-economic inequality between provincial levels. This report highlights that Madesh and Karnali have the highest level of multidimensional incidence of poverty to compare with the national incidence. The aforementioned data shows that there is demographic variation and disparity is revealed in Nepal. A single and unitary policy can be challenged for newly restructured federal Nepal for health governance policy and strategy.

The general objective of this study is to assess the health outcome and inequality in provincial level of Nepal with respect to women literacy rate. The specific objectives are as follows:

1. To access the magnitude of variation of health status amongst the province of Federal Democratic Republic of Nepal.
2. To estimate the relationship between women's literacy with key health outcomes in provincial level.

Literature Review

WHO (2017) has updated the ample of evidences and social factors including education, employment status, income level, gender and ethnicity that influence the health of the people. Furthermore, WHO also highlights the ten facts of health inequalities and their clause in the global scenario. Such types of issue of ample inequality in health sector would be intervening through the effective health governance. A research on Health inequality in global context (2013) theorizes that the social condition as fundamental causes of diseases and health. The existence of social inequalities in health is well established and there are the inequalities in health within a single country and society. The IMF (2004) has published the research report on health and development, a practical experiences of many countries on how the nations have got the level of economic development through the human development mostly the health sector contribution in economic development. Moreover, the research highlights last 100 years witness of global transformation in human health that has led to people living longer, healthier, more productive lives

has also boosted rates of economic growth worldwide. Therefore health is an asset individuals possess, which has intrinsic as well as instrumental value, in instrumental term, health impacts economic growth in a number of ways, it increase the labor productivity (MCM,2004).

Weitzman (2017) has theorized the women's education protect the maternal health by the empirical test of Peru. Educational levels support the cognitive ability, economic resources and the autonomy of women that positively influence the maternal health indicators. Another evidence also proves the strong correlation between woman's education and child health (Sandiford, 1995). Thirty years of research on data collected throughout Africa, Asia, and Latin America have confirmed the original findings of the research that women's schooling was robustly associated with a possible determinant of child mortality reduction in the less-developed countries (LDCs) during the second half of the 20th century (LeVine, 2009).

Health is one of the key indicators of human development approach. UNDP first human development report (1990) has emphasized the development thus concerns more than the formation of human capabilities, such as improved health or knowledge. The health and education make the men and women as the human resource and capital for overall socio-economic development. Health, education and income are the basic indicators to measure the development and poverty in the present day approaches. The latest few human development report indicates that Nepal has improved the HDI value over couple of decades. Comparative improvements are also seen in gender development index and gender empowerment measures across regions. However, the disparities among geographical regions and ethnic group remain entrenched though there are indications that gaps may be narrowing (Nepal HDI Report, 2014).

MoHP (2015) has conducted the survey on Health Services Availability and Readiness in Seven Provinces of Nepal. The survey has found the big gap among provinces exist in diagnostic service availability in health posts, availability of key essential medicines for child health services, and ANC service readiness in terms of availability of guidelines, equipment, and essential medicines. Another survey of health ministry (2019) has found the substantial differences in full immunization coverage of children age 6-59 months and childhood mortality by caste/ethnicity, provinces, and household wealth. The decline in full immunization coverage is significant among most of the caste/ethnicity groups and in all provinces except Bagmati, Gandaki, and Karnali. Childhood mortality is two times higher among Terai/Madhese Dalits than the national average. Madesh, Lumbini, Karnali, and Sudurpashchim, and the poorest households have the highest childhood mortality. Stunting is the highest among children from the Terai/Madhese Dalits and the Terai/

Madhesi other caste/ethnicity group, in Karnali. Karnali province has very low human development index as well as all health related indicators is noticeably low in comparison among another six province (Paudel & Amgain, 2018).

The MPI report 2018 has indicated that Nepal continuously progress has been made in multidimensional poverty since last decade. However the report has highlighted the unique feature and variations among the seven provinces of Nepal. The MPI -2018 shows the rural urban divide is evident with 7percent of the urban population and 33 percent of the rural population being multi-dimensionally poor. The Karnali and Madesh have the highest rate of multi dimensional poverty – with every second person being multi-dimensionally poor (50%) – followed by Lumbini and Sudurpashchim (approximately 30%). The majorcontributing indicators to overall poverty in Nepal and in rural Nepal are malnutrition and insufficient years of schooling.

Nepal has made the significant achievements in Millennium Development Goals (MDGs) mainly been remarkable in child and maternal mortality decreased. Building on the relative success of the MDGs, Nepal is committed to pursuing and achieving the Sustainable Development Goals (SDGs) by 2030. Among 17 goals of SDGs the third number goal is related to health and wellbeing to ensure the healthy lives promoting good health for all ages (SDG, 2017). Likewise 15 the national periodic plan has envisioned the slogan of prosper and happy Nepal through healthy and balance environment. Nepal has also envisioned as an enterprise-friendly middle-income developing countries by the end of 2030. To achieve such development goals and achievements Nepal should thoroughly understand the socio-economic disparities and response with the effective federal governance system as its province and local level.

Methods and Materials

The objectives of the paper are to assess the provincial health outcomes inequality in Nepal and examine the how women’s literacy does affect their health status. Basically the paper is based on secondary level quantitative data and information analysis with explanatory research design. Most of information was taken from Ministry of Health and Population of Nepal a demographic health survey of Nepal (DHS, 2016). Purposely some selected key health indicators were selected for the analysis of provincial health outcomes. Simple statistical tools: table, diagram, figure are used in the discussion. The significance of provincial health outcomes and inequality was measure by chi-square test in the confined key indicators in seven provinces in Nepal. To find out the relationship between women literacy and other key health indicators, statistical tolls like correlation and regression analysis were used to test hypothesis. The study could not observe the all key health outcomes of the provincial level identified by the ministry of health and population in Nepal.

However women literacy rate, child immunization, status of institutional delivery, contraceptive prevalence among married women, antenatal care, teenage pregnancy rate and total fertility rate were confined as the major variables. The implication of the study will help to make effective public health policy and strategy to reduce the equity gaps in health outcomes for the poorest segment of the population in federal and local level of Nepal.

The abbreviation and definition of the observed variables are given the table below.

Table 1

Description of the Variables

Abbreviation	Operational Definition of Variables
WLR	Women Literacy Rate in provincial level for 2016
ID	Institutional Delivery Rate in provincial level for 2016
CPMW	Contraceptive Prevalence among Married Women in provincial level for 2016
CIR	Child Immunization Rate in provincial level for 2016
ANCRW	Antenatal Care received by women in provincial level for 2016
TPR	Teenage Pregnancy Rate in provincial level for 2016
TFR	Total Fertility Rate in provincial level for 2016

Results and Discussion

Geo-political Scenario of Nepal

Nepal is a country with rich diversity based on its unique geography, and its multicultural and sociocultural norms, values, religions, castes, and ethnicities. Nepal is divided into seven federal provinces, three ecological belts – Hill, Mountain, and Terai – and 753 municipalities in 77 districts. Nepal has 125 castes/ethnicities, 123 languages spoken as mother tongue, and 10 religions (Central Bureau of Statistics 2011). Nepal also has social and economic disparities that stem from a hierarchical caste-based system, patriarchal thinking, and geographic and regional differences (Bennett, 2005). The distribution of population, districts and local government units are varied among the seven provinces in Nepal (see Table 2). On the basis of population density Madesh Province is the most populated and Karnali is less dense in population. In comparison of geographical coverage area Karnali has its more

occupancy of the land area, but the rugged fragile unfertile mountain terrain has less agricultural productivity and due to the region there is low population density. The eastern Terai has its more fertile land easy accessibility and occurrences of economic possibilities that makes the Madesh province has high population density then other provinces. The table two shows the statistical variation among the seven province of Nepal below.

Table 2

Provincial Statistical data of Nepal (Population, Area, Districts, Units of Local Govts and HDI-Value)

Province	Population (2011)	Population Density	Area(km ²)	Districts	Number of Local Govt.	HDI Value
Province 1	4,534,943	175	25,905 km ²	14	137	0.553
Madesh	5,404,145	559	9,661 km ²	8	136	0.485
Bagmati	5,529,452	272	20,300 km ²	13	119	0.560
Gandaki	2,403,757	112	21,504 km ²	11	85	0.567
Lumbini	4,499,272	219	22,288 km ²	12	109	0.519
Karnali	1,570,418	41	27,984 km ²	10	79	0.469
Sudurpashchim	2,552,517	130	19,915 km ²	9	88	0.478
Total	26,494,504	180	147,557 km ²	77	753	0.579

Note. This table demonstrates the demographical, geographical and administrative information of the seven provinces of Nepal. The data area based on the CBS, Census of 2011.

Inequality in Key Health Output in Nepal

The MoHP (HMIS, 2017/18) has annually updated the health indices of Nepal in provincial basis. The table no. 3 presents the availability of health institutions in provincial level in Nepal. Majority of the people residing in the rural area can only access in the governmental Public Health Community Centre Services (PHCCS) and Health Posts (HP). Most of the governments National Hospital (NH) are concerned in the urban or town area, on the other hand most available hospital have been lacking the skilled health manpower, equipment and proper medicine.

Among 125 total national level hospital comparatively Karnali province has only 12, Madesh has 13 and Sudurpashchim has 14 national level hospitals are available. However Bagmati province has 33 and province no 5 has 20 national level hospitals. Likewise the number of PHCCS and HP are more concentrated on the Bagmati, Gandaki and Lumbini, in comparison to the Madesh and Karnali province. However, among the available health posts very few percentages have their own diagnostic capacity of laboratory. Gandaki (2.7%) and Karnali(5.4%) provinces have low level of diagnostic capacity of health post; there is lack of laboratory services. This scenario reveals that the uneven distribution of health institutions and its facilities, it derives the inequality in health services facilities in the provincial level. The table 3 shows the health availability of health institutions in provincial level in Nepal.

Table 3

Health Institutions in Province of Nepal

Province	NH	PHCCS	HPs	NPF	DCHPs (%)
Province 1	18	40	648	133	12.3
Madesh	13	32	745	196	19
Bagmati	33	43	640	1163	11.4
Gandaki	15	24	491	100	2.7
Lumbini	20	30	570	178	11.3
Karnali	12	13	336	46	5.4
Sudurpashchim	14	16	378	43	31.9
Total	125	198	3808	1822	13.4

Note. Table shows that the health institution facilities in provincial level in federal republic Nepal. The data is based on the annual report of 2018 Ministry of Health Nepal. The abbreviation, NH=National Hospital, PHCCS=Public Health Community Center Services, NPF=Non-Public Facility, DCHP= Diagnosis Capacity of Health Post.

Figure 1

Distribution of NH and PHCCS in Provincial Level

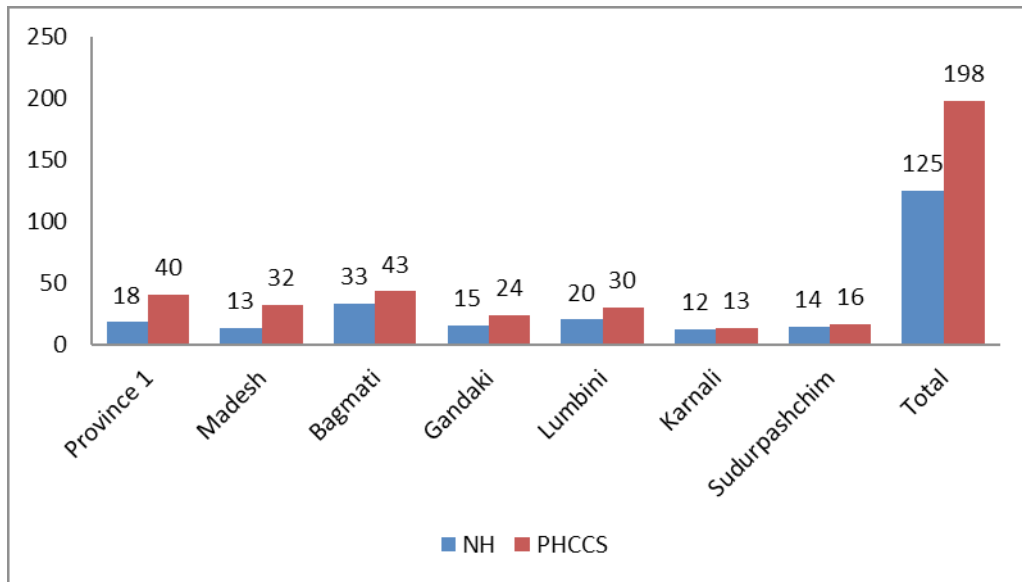
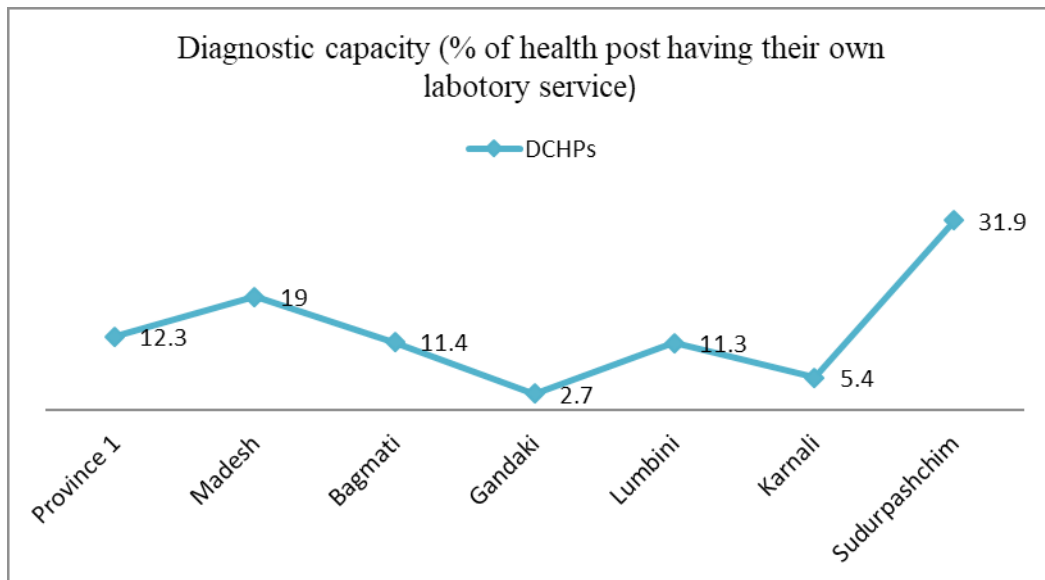


Figure 2.

Diagnostic Capacity of Health Post in Provincial level



The paper has observed the confined key health outcomes of Nepal in provincial level. The table no.4 defines the few health outcomes of Nepal in provincial level. We can observed the major health indicators related to maternal

health like, women literacy rate, institutional delivery, contraceptive prevalence of married women, child immunization percentage, antenatal care services, teenage pregnancy and total fertility rate in provincial level. The data shows that the women literacy and institutional delivery big variation among the provincial level. Likewise other health indicators are also unequal status between the provinces. Normally we can observe the unequal accessibility of the maternal health facility and disparity.

Table 4

Distribution of Health Outcomes in Provincial Level of Nepal

Province	WLR	IDR	CPMW	CIR	ANCRW	TPR	TFR
Province 1	77.7	62.2	55.1	80	76.9	15.5	2.3
Madhesh	38.5	44.6	47.7	66	53.4	27.3	3
Bagmati	82	70.7	60.6	57	78.4	10.1	1.8
Gandaki	86.4	68.3	48.5	66	76.7	13.9	2
Lumbini	72.6	59.4	48	74	73.7	13.4	2.4
Karnali	66.2	35.6	51.1	88	52.2	18.8	2.8
Sudurpashchim	67	66.4	57.3	76	77.3	16.1	2.2

Note. The table shows that the women literacy rate, IDR, CPMW, CIR, ANCRW, TPR and TFR status of seven province of Nepal. The source of data was taken from the National Demographic and Health Survey 2016.

Inequality of Women Literacy and Key Health Outcome in Province level

This study attempted to have insight on prevalence of inequality in women literacy rate (WLR) and some of the key health outcomes in Nepal like institutional delivery (ID), teenage pregnancy rate (TPR), child immunization rate (CIR), contraceptive prevalence among Married Women (CPMW), completeness of ANC and total fertility rate (TFR). To make inference on this issue, data on the report were collected from seven provinces of Federal Democratic Republic of Nepal published by Ministry of Health and Population of government of Nepal and Chi-square test was carried out to test the goodness of fit of the aforementioned variables one by one. According to chi-Square test result (Table 5), it could be observed inequality in WLR and IDR. In other words, there couldn't be observed inequality in others like child immunization rate, contraceptive prevalence rate, completeness of ANC service and fertility rate. The statistical calculation shows that, among seven hypotheses of the study only two accepted and other five are rejected. It indicates that there is less inequality in the maternal health related indicators among seven provinces in Nepal.

Table 5*Chi-square Estimated output Result of Health Inequalities in Provincial Level*

Variables	Calculated Chi-Square(C)	Tabulated Chi-Square(T)	P-Value	If C >T: Accept Research hypothesis If C >T :Reject Research hypothesis	Decision
WLR	21.335	12.59159	0.00	C >T	Accept H ₁
IDR	17.855	12.59159	0.00	C >T	Accept H ₂
CPMW	2.975	12.59159	0.81	C <T	Reject H ₃
CIP	8.777	12.59159	0.18	C <T	Reject H ₄
ANCRW	11.778	12.59159	0.06	C <T	Reject H ₅
TPR	10.971	12.59159	0.08	C <T	Reject H ₆
WFR	0.456	12.59159	0.99	C <T	Reject H ₇

Note. The table shows the statistical calculation of variables Chi-Square Test data from the NDHS, 2016.

Causal Relationships between Women Literacy and Key Health Outcomes

This study attempted to have insight on causal relationship between women literacy and some of the key health outcomes in Nepal like institutional delivery, teenage pregnancy, child immunization rate, contraceptive prevalence rate, completeness of ANC vaccination. To make inference on issue, data on the same were collected from seven provinces of Federal Democratic Republic of Nepal. Regression analysis was done between women literacy rate and remain other variables one by one in the table 6.

The relationship between women literacy rate (WLR) and institutional delivery (ID) was observed using statistical tolls like correlation and regression analysis tool to test hypothesis that WLR has causal relation to ID. The output result shows that there is positive correlation between the variables ($r = 0.67$). The regression output result shows that one-unit increase in WLR cause 0.56-unit increase in IDR. Likewise, the estimated R^2 shows that the independent variable WLR can predict ID by 45 percent and the coefficient is significant at 10 percent level. Similarly the relation between WLR and CPMW, we can observed the output result in the moderate level correlation between the variable ($r = .037$). The estimated R^2 indicates that the independent variable WLR can forecast CPWM by 14 percent and the coefficient is significant at 5 percent level.

We can observe the next relationship between women literacy rate (WLR) and child immunization rate (CIR). The output result reveals that there is highly

positive correlation between the variables ($r=0.09$) and the coefficient is significant at 5 percent level. Likewise another positive correlation can be observed the relationship between WLR and TPR, the estimated R^2 indicates that the independent variable WLR can predict TPR by 86 percent and the coefficient is significant at 1 percent level. As well the correlation of women literacy rate with antenatal care received and fertility rate it is observed that the significantly positive relationship with the mentioned variables. On the basis of statistical test and its results in empirical way, the theory of education\literacy rate has positive relation with health status can be observed in the study. Therefore, in the context of Nepal, provincial health governance strategy should be focused on education and literacy of the women.

Table 6

Statistical Analysis of Women's Literacy with Different Variables

Casual relation of Variables	Variables	Coefficient	Std. Error	t-stat.	P-Value
1. Relation between WLR and IDR	Constant	18.8348	19.7193	0.955141	0.38
	WLR	0.561493	0.275546	2.037751	0.09*
$R^2 = 0.453697$ Adjusted $R^2 = 0.344436$ Correlation Coefficient = 0.67357 $IDR = 18.83 + 0.56WLR$					
2. Relation between WLR and CPMW	Constant	44.08402	9.597425	4.593317	0.005**
	WLR	0.121762	0.134108	0.907936	0.40
$R^2 = 0.141535$ Adjusted $R^2 = 0.03016$ Correlation Coefficient = 0.376211 $CPMW = 44.08 + 0.12WLR$					
3. Relation between WLR and CIR	Constant	76.9081082	20.77182	3.702521	0.01**
	WLR	-0.06394119	0.290252	-0.2203	0.83
$R^2 = 0.009612731$ Adjusted $R^2 = 0.18846472$ Correlation Coefficient = 0.098044536 $CIR = 76.90 - 0.06WLR$					

4. Relation between WLR and ANCRW	Constant	30.327514	15.435535	1.964785459	0.10
	WLR	0.5634327	0.215686	2.612282768	0.04**
R ² = 0.577132		Adjusted R ² = 0.4925584		Correlation Coefficient = 0.7596921	
WANCR=30.32+0.56WLR					
5. Relation between WLR and TPR	Constant	39.07771	4.086733	9.562091	0.00***
	WLR	-0.32309	0.057105	-5.65782	0.00***
R ² = 0.864905		Adjusted R ² = 0.837885		Correlation Coefficient = 0.930002	
TPR=39.07 - 0.323WLR					
6. Relation between WLR and TFR	Constant	3.9663612	0.444657	8.920054	0.00***
	WLR	-0.0229701	0.006213	-3.6969	0.01**
R ² = 0.7321485		Adjusted R ² = 0.6785782		Correlation Coefficient = 0.8556568	
WFR=3.96 -0.022WLR					

Note. *, ** and *** implies significance of coefficient at 10 percent, 5 percent and 1 percent level. The calculation based on data from NDHS, 2016.

Conclusion

The relationship between women literacy rate and the maternal health status has shown the positive correlations. The literacy rate of women is positively correlated with institutional delivery rate, contraceptive prevalence rate amongst married women and antenatal care received by women. It implies that higher the rate of women literacy, higher the IDR, CPMW and ANCRW. On the other hand, the literacy rate of women is negatively correlated with TPR, TFR and CIR. It implies that higher the rate of women literacy lower TPR, TFR and CIR. The implication of the result is that increasing WLR is key to achieve expected health outcome such as increase IDR, CPMW and WANCR and TPR, TFR decrease. But, it is a matter of further inquiry that why WLR and CIR negatively correlated. The expected result is positive. Furthermore, to improve the health outcomes and narrowing the health inequalities in provincial and local level in Nepal, equitable health sector reform policy and strategy should essential for effective federal health governance

in Nepal. The study shows the provincial level inequality in the health outcomes in Nepal. There are mixed consequences behind the health outcomes disparity in provincial level. Diversity in geography, cultural norms and values are the distinct characteristic of Nepal that affects the health outcomes. Similarly, the government institutional basic health service delivery has also effect on the health outcomes that varies by the place. Likewise access to health care is unequal at the province level on the basis of the health institution providing the service and its capacity. This shows that if the health service is to reach the majority of the people, the institutions of the health service delivery should be increased at the local and community level. The inequality analysis in maternal health key indicators, it shows that the rate of women literacy and institutional delivery are unequal with in a provincial level. It is essential to enhance the institutional delivery services in provincial and local level. Other indicators like; contraceptive prevailing of married women, child immunization, ANC, teenage pregnancy and total fertility rate are more or less similar at the provincial level. The policies and strategies adopted by the government are also focused on providing easy access to basic health care to the general public.

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