

Summer Training Report

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MBA-HM_24

MBA (Hospital and Health Management)

2019-21



PART 1

ASSOCIATION OF LITERACY RATE WITH MATERNAL HEALTH CARE UTILIZATION IN ODISHA

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ABBREVIATIONS

AHS	Annual Health Survey
ANC	Ante-natal Care
ASHA	Accredited Social Health Activist
AWW	Anganwadi Worker
CHC	Community Health Center
CI	Confidence Interval
DPT	Diphtheria, Pertussis and Tetanus
JSY	Janani Suraksha Yojna
LHV	Lady Health Visitor
LaQshya	Labor Room Quality Improvement Initiative Guideline
MDG	Millennium Development Goal
MMR	Maternal Mortality Rate
NFHS	National Family Health Survey
OR	Odd's Ratio
PHC	Primary Health Center
SDG	Sustainable Development Goal
SRS	Sample Survey Registration
UNDP	United Nations Development Program
UNICEF	United Nations Children Education Fund
WHO	World Health Organization

CHAPTER- 1 INTRODUCTION

The well-being of mothers both physically and emotionally during pregnancy, childbirth and the post-natal, refers to maternal health. Excessive blood loss infection, high blood pressure, abortion done in unsafe environment without the supervision of a skilled professional, obstructed labor and some of the indirect caused such as anemia malaria, heart disease lead to maternal injuries or even death. Most of these reasons are completely preventable if they are managed by a professional working in a supportive environment at the right time. The global agenda is to reduce preventable maternal deaths. And while this remains our top priority, survival of the mother during childbirth should not be restricted to maintaining good maternal health. Efforts should also be made into reducing the injuries resulting from [childbirth](#)¹.

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According to WHO, Maternal Mortality can be defined as. ‘Maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes. To facilitate the identification of maternal deaths in circumstances in which cause of death attribution is inadequate, a new category has been introduced: Pregnancy-related death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the cause of [death](#)².

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While the prevalence of maternal mortality is much lower in developed countries, developing countries of Asian and Africa continue to struggle keeping mothers alive during childbirth or post deliveries. A decline of 38% has been seen in the mortality trends from 342 death to 211 deaths per 100,000 live births from 2000 to 2017(UNICEF, 2019). While this decline may seem significant, it is still not substantial enough to reach the Sustainable development goal which aims at reducing MMR to 70 per 100,000 live births by the year 2030^{1,4}.

The United Nations held a conference in 2012, in Rio de Janeiro lead to the formation of Sustainable Development Goals which is aimed at constructing a set of goals to meet with the requirements of the world in various areas such as environmental, political, health and wellbeing etc. The SDG’s replaced the MDG’s which began as an initiative to end poverty. Off the 17 Goals Globally, first target of Goal 3 of SDG is ‘by 2030, reduce the global maternal mortality ration to less than 70 per 100’000 live births (UNDP, 2011)^{3,4}.

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It is of utmost importance for women to receive the care they deserve, but unfortunately do not receive. With men being the primary bread-winner of the family in most developing countries along with the ideology that they are the torchbearers of taking the genes forward, makes women an outcaste in their own house. More often than not, countries with high MMR also report high female feticide, sex selective abortion, low literacy rate among women when compare to the men in the same area as well as mal nourishment⁵⁻⁴

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1.1 RESEARCH QUESTION-

Does literacy rate influence the maternal health care utilization in Odisha?

1.2 HYPOTHESIS-

Null Hypothesis- There is no association between literacy rate and maternal health care utilization

Alternate Hypothesis- There is an association between literacy rate and maternal health

1.3 OBJECTIVE-

To find out association between maternal health care utilization and literacy rate in Odisha.

1.4 BACKGROUND-

As per the SRS bulletin 2015-17, the maternal mortality rate of India is 122 per 100,000 live births with a Confidence Interval of 95%. Four percent of these deaths are observed amongst adolescents between the age group of 15-19 years⁶⁻⁽⁴⁾. India has seen a tremendous decline in maternal mortality in the recent years, however it is still far from reaching its SDG target. The Government of India has initiated various schemes aimed towards improving maternal and child healthcare and reduce mortality. The programs are as follows,

Janani Surakhsha Yojana, launched in the year 2005 with the purpose of promoting institutional deliveries by trained professionals in reducing maternal and neonatal

mortality occurring during childbirth, in all states and UT's with emphasis on Low performing states by providing cash assistance⁷.~~(5)~~

Janani Shishu Suraksha Karyakaram- was started after the launch of JSY in the year 2011, to eliminate out of pocket expenditure before, during and after childbirth, for both the mother and the infant until he is 1 year old⁸.~~(6)~~

Pradhan Mantri Surakshit Matritva abhiyan, under which a date is fixed for antenatal care for women in the 2nd and 3rd trimester, which is the 9th of every month providing comprehensive and quality care. This facility is not only available in the government health facilities like the PHC's and CHC's, but some of the private sector hospitals have also volunteered to be a part of this initiative⁹.~~(7)~~

Labor Room and Quality Improvement Initiative (LaQshya), the NFHS-4 data 2015-17 showed an increase in institutional deliveries from 38.7% to ~~78~~8.9%, but this surge in institutional deliveries did not lead to a decrease in maternal and neonatal mortality rates. The labor room quality in the healthcare facility is said to be a major contributing factor, to combat which, LaQshya was implemented which contains a set of guidelines and standards the labor rooms need to follow. Launched by the Ministry of Health and family Welfare, the beneficiaries of this initiative are every pregnant woman and newborn delivering in a public health facility^{10,11}.~~(8,9)~~

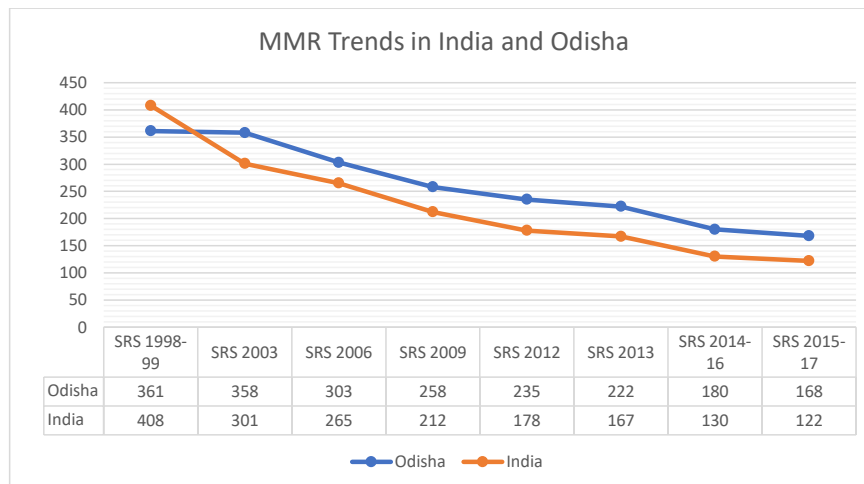
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Apart from programs that are launched on a national level, some state government also initiate schemes of their own keeping in mind the regional requirements which are subjective to each state differently. One such state is Odisha, in which the state government launched the MAMTA campaign in the year 2011, where in the government bears the cost of antenatal, Institutional delivery and post-delivery expenditure of the mother and child (for the 1st year), for upto 2 children¹².~~(10)~~

The Government of Odisha has also initiated a Chemoprophylaxis program where in pregnant women are given prophylactic Chloroquin after 12 weeks of pregnancy and continued until 2 weeks after delivery. Odisha is a malaria prone state and apart from causing maternal and infant mortality, it is also responsible for low birth weight¹².
(DoHFW, Odisha).~~(10)~~

A low performing state situated on the east coast of India with a total population of 41,974,218, Odisha has an MMR of 168, which is much higher than the national average of 122 per 100,000 [live](#) births. A vast majority of people live in the rural areas, with only 1/6th i.e. 17 % of the population living in Urban areas¹³ (NFHS-4, 2015)¹⁴. Odisha has a literacy rate of 72.8%, which is lower than the national average of 74.04%¹⁴. Literacy rate is the important parameter in assessing the economic development which in turns means better human development, better standards of living. Literacy is as important for individual and community wellbeing as it to economic development.

Figure- 1 Comparing the MMR trends in India and Odisha for the Last 22 years



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Source- SRS database

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1.5 METHODOLOGY

Various online platforms were used to gather research paper which are relevant for the study such as Scholarly, PubMed and Google.

The secondary data was collected from various reliable government database such as, National Family Health Survey-4 (NFHS-4) 2015-16

It is a large scale, multi round survey conducted in a representative sample of households throughout India. The survey holds four questionnaires relating to household, women, men and biomarkers. The data was collected from 30 districts of Odisha between 21st January 2016 and 4th July 2016 by IIHMR University. The survey was conducted on 30,242 households in Odisha, by interviewing 33,721 women between ages 15 and 49 years and 4,634 men between ages 15 and 54 years.

Census 2011

As of 2020, the census has been conducted 15 times in India, the last one being 2011. It is held every 10 years by the Census Commissioner of India and Registrar General under The Ministry of Home Affairs, Government of India.

Annual Health Survey 2011-2012

Started [under the chairmanship of Prime Minister of India, the first AHS was conducted in the year 2010-11](#). ~~in the year 2005, It compared all the district against benchmarks (AHS Factsheet, 2011-12)~~ It prepares a district health profile which is comprehensive. It was initially confined to the 8 Empowered Action Group states because of a large sample size.

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The Sample Registration System

The SRS was initiated by the Office of the Registrar General, India, started on a pilot basis in selected states in the year 1964-65. The data from the SRS bulletin 2015-17 has been used for the purpose of this study where in a female population sample of 647,5970 was taken between the age groups of 15-49 years. In this, a total of 525 maternal deaths have been reported. The maternal death being a rare event, requires a large sample size to get correct estimates. Hence, the sample size is enhanced by using a data collected over 3 years to produce reliable estimates. Taking into consideration the out-migration rates of a region during the half yearly survey, a correction factor is multiplied to the data obtained on maternal deaths⁶.

The relationship between the two variables, which are the maternal health indicators and literacy rate, is established using Pearson's correlation coefficient formula where,

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n \sum x^2 - (\sum x)^2][n \sum y^2 - (\sum y)^2]}}$$

A positive value of r means a positive correlation between the variables whereas a negative value of r denotes a negative correlation.

Range of Pearson's correlation coefficient= +1 to -1

High degree of correlation = ± 0.50 to ± 1

Moderate degree of correlation = ± 0.30 to ± 0.49

Low degree of correlation = ≤ 0.29

No correlation when the value is ZERO.

Fishers transformation applied to find a range to the original r with a 95% CI.

CHAPTER-2 REVIEW OF LITERATURE

~~Montgomery AL, Ram U, Kumar R, Jha P; Million Death Study Collaborators. Maternal mortality in India: causes and healthcare service use based on a nationally representative survey. *PLoS One*. 2014;9(1):e83331. Published 2014 Jan 15. doi:10.1371/journal.pone.0083331~~¹⁵

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The aim of the study was to evaluate the discrepancies in access to healthcare among rural household in poorer states and rich states. About 1.1 million households were interviewed by the field staff regarding deaths that's occurred between 2001 and 2003, wherein two physicians assigned the cause of death independently for each death. In total 130 medical officers were recruited, and the data of the survey was emailed. Of the 10,041 deaths that did occur during the duration amongst women in the age group 15-49 years due to various causes, about 11% (1096) were maternal deaths.

The most common direct cause of maternal deaths was hemorrhage (38%), others (34%), sepsis (11%), abortion (8%), obstructed labor (5%) and hypertensive pregnancy disorder (5%) (source- *Indian SRS 2001-3*)

Antenatal care and institutional deliveries were much less in the poorer states when compared to the richer states of India.

Rao-Scott chi squared test was done to compare the richer and poorer states healthcare distribution

The cause of death in both, the poorer states and the rich remained unchanged, however, a larger number of women in poorer states had extremely limited access to healthcare facilities. When compared, the rural areas saw poor access to healthcare facilities than the urban areas in the same state of the poorer category. (Montgomery AL, Ram U, Kumar R, Jha P., 2014).

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~~Goli S, Jaleel AC.~~ What is the cause of the decline in maternal mortality in India? Evidence from time series and cross-sectional analyses. ~~*J Biosoc Sci.* 2014;46(3):351-365. doi:10.1017/S0021932013000564~~¹⁶

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The aim of the study was to analyze the factors such as institutional deliveries, socioeconomic and demographic factors which could have led to a decline in Maternal Mortality. To do this, the author uses a time series and regression analysis of the numerous factors that could have contributed in this decrease.

On performing the barro regression estimate, it was seen that more than institutional deliveries, an increase in growth in state income, reduced poverty, higher literacy, and fertility lead to a decline in maternal mortality. A weak correlation was seen between institutional deliveries and decline in MMR, which means that deliveries in health facilities will not necessarily transition into better chances of survival of the mother, if she does not receive proper antenatal care (Goli S, Jaleel AC., 2014). Delay in reaching the healthcare facility as well as the preparedness of the couple/family are also crucial factors which could decline the MMR.

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~~Rai RK, Singh PK.~~ Janani Suraksha Yojana: the conditional cash transfer scheme to reduce maternal mortality in India – a need for reassessment. ~~*WHO South East Asia J Public Health* 2012; 1:362-8~~¹⁷

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The aim of this research article was to evaluate the effectiveness of the JSY in reducing MMR and the various ways in which it requires improvement in its design and execution.

The authors argue that use of conditional cash transfer for the service provided is not the solution to reduction in MMR and that the managers of the program and policy makers should consider the maternal health services as a package of continuum which starts right from pre-teen years and go on until after the delivery and beyond that.

The promotion of maternal health is not restricted to only providing institutional deliveries, but emphasis should also be given to antenatal and post-natal care. According to SRS data, nearly 45% of women do not, at a national level, seek treatment post-delivery.

The authors conclude the research article by proposing to rethink the incentive system of the JSY, as well as to increase the sending of the healthcare budget on maternal health packages. [\(Rai RK, Singh PK., 2012\)](#)

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~~Randive B, Diwan V, De Costa A.~~ India's Conditional Cash Transfer Programme (the JSY) to Promote Institutional Birth: Is There an Association between Institutional Birth Proportion and Maternal Mortality? ~~PLoS One.~~ [2013;8\(6\):e67452. Published 2013 Jun 27. doi:10.1371/journal.pone.0067452](#)¹⁸

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Like the earlier research paper, this also aims at evaluate the effectiveness of JSY and forming an association between institutional deliveries with the increase or decrease in the maternal mortality.

The data used for the secondary research is obtained from SRS, AHS and a comparison in trends is made between institutional deliveries those before the years 2005 and that which occurred between 2006-2010, the year JSY was implemented in the nine states of India, namely Bihar, Uttar Pradesh, Uttarakhand, Madhya Pradesh, Odisha, Chhattisgarh, Assam, Jharkhand and Rajasthan.

These nine states were further divided into 286 districts of which the data was used.

The paper concludes by showing a positive increase in Institutional deliveries after the implementation of JSY, with no significant or a slight negative correlation between the increase in institutional deliveries with MMR ($r = -0.11$).

No significant association was established between institutional births and MMR on doing a multivariate regression analysis [\(Randive B, Diwan V, De Costa A., 2013\)](#).

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~~Gupta SD, Khanna A, Gupta R, Sharma NK, Sharma ND.~~ Maternal mortality ratio and predictors of maternal deaths in selected desert districts in rajasthan a community-based survey and case control study. ~~Womens Health Issues.~~ [2010;20\(1\):80-85. doi:10.1016/j.whi.2009.10.003](#)¹⁹

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The aim of the study was to estimate the ratio of MMR in the desert districts of Rajasthan and to predict the probable causes resulting in maternal deaths.

This is a case control study which was performed in two parts where in the first stage comprised of a community-based survey in the households of the selected districts and then a case control study of the same population. The study covered 25,926 households in 411 villages. In the duration of the study, 32 maternal death and 6,165 live births were identified

Case- Died during pregnancy of childbirth

Control- Survived during and after childbirth

Hemorrhage showed to be the major cause of mortality ([Gupta SD, Khanna A, Gupta R, Sharma NK, Sharma ND, 2010](#)). An independent relation was seen between conceiving at an early age and poverty on the maternal mortality with an Odds ratio of 2.6 and 2.5 respectively (95% CI)

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The author also stated the need the re-evaluation of program efficiency and strategies for decreasing these complications.

~~Johri M, Subramanian SV, Sylvestre M, et al~~

Association between maternal health literacy and child vaccination in India: a cross-sectional study

~~J Epidemiol Community Health 2015;69:849-857²⁰~~.

The study was conducted in two underserved communities of India, where the author aims to find the association between mother's education corresponding with immunization of the child. A cross sectional survey was conducted in the urban and rural areas and health literacy was measured using Indian child health promotion material. The rural analysis was done from 60 villages in which 1170 women participated, and Urban analysis consisted of 670 from 9 slum clusters. The study was based on whether the child has received 3 doses of DPT and its association with mother's literacy ([Johri M, Subramanian SV, Sylvestre M, et al, 2015](#))

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The adjusted OR for both urban and rural areas were high in case of high health literacy among mothers, which means mothers literacy is independently associated with better immunization of children.

~~Kharazi, Seyde Sara and Peyman, Nooshin and Esmaily, Habibolah (2016)~~
Association between maternal health literacy level with pregnancy care and its outcomes.~~The Iranian Journal of Obstetrics, Gynecology and Infertility, 19 (37). pp. 40-50~~²¹.

The study aimed at performing an investigation to show the correlation between health literacy among women and pregnancy outcome.

Cross sectional study and descriptive analysis was performed on 120 women in the year 2010 who visited the Health-center of Mashhad for prenatal care. The data was analyzed using the SPSS software as well as descriptive statistics, t test, correlation test to find the association between maternal literacy and pregnancy, birth-weight, supplement consumption etc.~~(Kharazi, Seyde Sara and Peyman, Nooshin and Esmaily, Habibolah, 2016).~~

A significant correlation was found between literacy and pregnancy outcome wrt $p = < 0.001$.

~~Mira Johri, SV Subramanian, Georges K Koné, Sakshi Dudeja, Dinesh Chandra, Nanor Minoyan, Marie-Pierre Sylvestre, Smriti Pahwa, Maternal Health Literacy Is Associated with Early Childhood Nutritional Status in India, The Journal of Nutrition, Volume 146, Issue 7, July 2016, Pages 1402-1410~~²².

The study was to investigate the association between literacy rate and under-nurishment in 2 populations of India that are resource poor. One mother was interviewed from each household with a child between 12-24 months of age, in rural and urban areas. A multivariate regression analysis was performed independently on each site. The ability of the respondent to assess various health-related information was assessed using the Indian health promotion material, and the child was assessed based on three outcomes, which are severe underweight, severe stunting and severe wasting. 1116 and 637 pairs of mother and child were used in the survey from ~~ma~~ rural and urban areas respectively. A strong association was seen between health literacy rate of the mother and nutritional status of the child in the resource poor populations of India in the region (~~Mira Johri, SV Subramanian, Georges K Koné, Sakshi Dudeja, Dinesh Chandra, Nanor Minoyan, Marie-Pierre Sylvestre, Smriti Pahwa, 2016).~~

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Some of the limitations of the study were unavailability of data relating to mothers nutritional status such as BMI, genetic predisposition which could have lead to a smaller stature. Another draw back of the study is the diverse interpretation of the Indian health promotion material, which may not provide a comparable result had the study been performed aging.

~~Birmeta, K., Dibaba, Y. & Woldeyohannes, D.~~ **Determinants of maternal health care utilization in Holeta town, central Ethiopia.** ~~BMC Health Serv Res 13, 256 (2013).~~ ²³

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The aim of the study to assess the determinants of maternal health-care facility utilization among women who has given birth within the 3 years period before the survey was conducted and literacy rate. (Birmeta, K., Dibaba, Y. & Woldeyohannes, D., 2013)

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Cross sectional study was conducted between January 20th and- February 20th 2012, in Central Ethiopia. Data on 422 women of the town of Holeta was collected for the purpose of this study and a bivariate and multivariate logistic regression analysis was performed. Inadequacy was seen in utilization of ANC care, which was correlated to various demographic, socio-economic and health related factors. The odds of a women using ANC at the local hospital was approximately 3 times more in women with better knowledge on the warning signs of pregnancy (OR= 3.51), than those with poor²³.

TABLE- 1 SUMMARY OF REVIEWED LITERACTURE

YEAR PUBLISHED	PLACE	OBJECTIVE	SAMPLE SIZE/ SOURCE OF DATA	KEY FINDINGS
2001-2003	India	To find the usage of healthcare facilities by women in the rich and poor states of India	SRS 2001	Women from poorer states had poor access to healthcare, where as socio- economic factors influenced usage

				of the facilities in the same states
2014	India	To find the factors associated with a decline in MMR	NFHS-3	Decrease in poverty and female literacy showed a bigger impact on declining MMR, where as institutional deliveries show not significant impact
2017	India	To implicate the need for reassessment of JSY in reducing MMR	DLHS-3	Despite the increased institutional deliveries, this has not translated positively in declining MMR. Maternal health should be seen as a package starting from adolescent years and continue post delivery, and not just at the time of delivery
2013	India	The aim of the study was to find an association	SRS, AHS	No association was seen between MMR and institutional

		between institutional deliveries and MMR by comparing data before 2005(the year JSY was launched and period between 2006 to 2010		deliveries
2010	Rajasthan, India.	The aim of the study is to estimate the MMR and find the possible cause of death in the desert cities of Rajasthan	25,926 households interviewed in 411 Village.	Poverty, adolescent pregnancy and home births were some of the factors associated with increased MMR. Most common direct cause of death in mothers was due to hemorrhage
2013	India Rural- Hardoi, Uttar Pradesh Urban slum- New Delhi	The study aims at finding a relationship between maternal health literacy and immunization	Rural- 1170 women Urban- 670	Lower immunization coverage seen in rural village when compared to urban slums. At the same time, higher immunization rate

		in rural village and urban slum		seen with mothers with high and medium health literacy, than those with lower literacy.
2016	Mashhad, Iran	Aims to find the association between maternal health literacy with pregnancy care and the outcomes.	120 women	There was a significant association seen between maternal health literacy and pregnancy outcomes such a birth-weight, pre and post natal care.
2016	India, particularly 2 resource poor states.	The study aims to find a association between maternal health literacy with early childhood nutritional status	Rural- 1116 and Urban- 576 mother-child pair.	The odds of the child being malnourished, stunted was 50%(0.5 times) less likely in mothers with high or medium literacy rate, both in urban as well as rural.
2012	Holeta , Ethiopia.	To find the factors that determine the utilization of healthcare facilities	422 women	The odds of a women utilizing ANC services was 3 times more in women who are aware of the

				warning signs in pregnancy. It was also seen that the perception of husbands greatly influenced this usage of healthcare facility.
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CHAPTER- 3 **RESULTS**

3.1 DEMOGRAPHY

~~10 districts were selected based on the literacy rate for the purpose of this study~~

TABLE-2 The demographic findings of the 30 districts in **Odisha**

DISTRICT	POPULATION	DENSITY/KM Sq.	SEX RATIO (PER 1000)	AVERAGE LITERACY (%)	<u>AVERAGE FEMALE LITERACY (%)</u>
Khorda	2,251,673	800	929	86.88	<u>81.61</u>
Jagatsinghpura	1,136,971	682	968	86.59	<u>80.63</u>
Cuttack	2,624,470	667	940	85.50	<u>79.55</u>
Kendrapara	1,440,361	545	1007	85.15	<u>78.96</u>
Puri	1,698,730	488	963	84.67	<u>78.28</u>
Bhadrak	1,506,337	601	981	82.78	<u>75.83</u>
Nayagarh	962,789	248	915	80.42	<u>72.05</u>
Jajapur	1,827,192	630	973	80.13	<u>73.29</u>
Baleshwar	2,320,529	610	957	79.79	<u>72.28</u>

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Jharsuguda	579,505	274	953	78.86	70.73
Dhenkanal	1,192,811	268	947	78.76	71.00
Anugul	1,273,821	200	943	77.53	68.64
Sambalpur	1,041,099	157	976	76.22	67.93
Bargarh	1,481,255	254	977	74.62	65.38
Subarnapur	610,183	261	960	74.42	64.04
Sundargarh	2,093,437	216	973	73.34	65.48
Debagarh	312,520	106	975	72.57	63.05
Baudh	441,162	142	991	71.61	59.79
Ganjam	3,529,031	430	983	71.09	61.13
Kendujhar	1,801,733	217	988	68.24	58.28
Balangir	1,648,997	251	987	64.72	53.50
Kandhamal	733,110	91	1037	64.13	51.94
Mayurbhanj	2,519,738	242	1006	63.17	52.71
Kalahandi	1,576,869	199	1003	59.22	46.68
Naupada	610,382	158	1021	57.35	44.76
Gajapati	577,817	134	1043	53.49	43.18
Rayagada	967,911	137	1051	49.76	39.19
Korapat	1,379,647	157	1032	49.21	38.55
Malkangiri	613,192	106	1020	48.54	38.28
Nabarangapur	1,220,946	231	1019	46.43	35.80

Source- Census 2011

3.2 MATERNAL HEALTH INDICATORS

The various indicators (NFHS-4) that are used in assessing the relationship between literacy rate and maternal health [care utilization](#) are as follows,

- Women aged 15-19 years who were already mothers or pregnant at the time of survey
- Mothers who had at least 4 antenatal care visits
- Mothers who received post-natal care from a doctor/nurse/LHV/ANM/midwife/other health personnel within 2 days of delivery

- Institutional births

3.2.1 Woman aged 15-19 years who were already mothers or pregnant at the time of survey

As stated earlier, adolescent pregnancy amounts to four percent of maternal deaths in India. An estimated 21 million girls between the age of 15-19-year-old get pregnant every year globally, out of which 12 million of them give birth. The remaining 9 million either get an abortion or die during pregnancy. Even the proportion of girls getting abortion in a medical setting under the supervision of a medical professional is low, which further adds to maternal mortality²⁴. Much of these cases go undocumented due to the stigma attached with pregnancy out of wedlock. In countries like India, even with the legal age of marriage being 18year (now 21years for females as of 2020), child marriage is still a problem faced in many rural areas in the interiors. Approximately sixteen percent of teenage girls between 15 and 19 years of age are currently married in India²⁵

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TABLE-3 Average female literacy rate (%) and women aged 15-19 years who were already mothers or pregnant at the time of survey (%) of the 30 districts in Odisha

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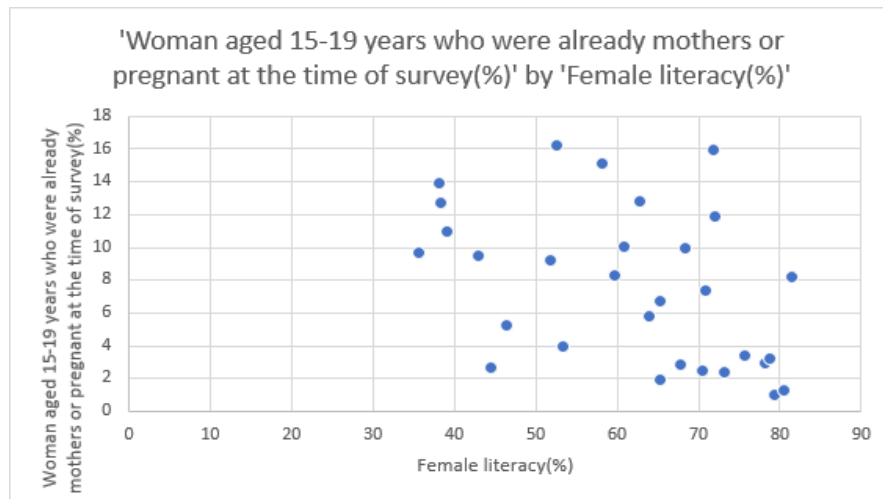
	<u>AVERAGE FEMALE LITERACY (%)</u>	WOMEN AGED 15-19 YEARS WHO WERE ALREADY MOTHERS OR PREGNANT AT THE TIME OF SURVEY (%)
Khorda	<u>81.61</u>	8.1
Jagatsinghpura	<u>80.63</u>	1.2
Cuttack	<u>79.55</u>	0.9
Kendrapara	<u>78.96</u>	3.1
Puri	<u>78.28</u>	2.9
Bhadrak	<u>75.83</u>	3.3

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Nayagarh	72.05	15.9
Jajapur	73.29	2.3
Baleshwar	72.28	11.8
Jharsuguda	70.73	2.4
Dhenkanal	71.00	7.3
Anugul	68.64	9.9
Sambalpur	67.93	2.8
Bargarh	65.38	1.8
Subarnapur	64.04	5.7
Sundargarh	65.48	6.6
Debagarh	63.05	12.7
Baudh	59.79	8.2
Ganjam	61.13	10
Kendujhar	58.28	15
Balangir	53.50	3.9
Kandhamal	51.94	9.1
Mayurbhanj	52.71	16.1
Kalahandi	46.68	5.2
Naupada	44.76	2.6
Gajapati	43.18	9.4
Rayagada	39.19	10.9
Korapat	38.55	12.6
Malkangiri	38.28	13.8
Nabarangapur	35.80	9.6

Source- Census 2011 and NFHS-4

Figure 2- Scattered graph between [female literacy-rate \(%\)](#) and [Women aged 15-19 years who were already pregnant at the time of survey \(%\)](#)



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Source- Census 2011 and NFHS-4

The calculated value of r from the given data set is -0.4394, upon applying fishers transformation, we get a range of 95% CI which is -0.0990 to -0.688 (Standard Error= 0.19)597.

Critical value of r is ± 0.36 (two-tailed test, 0.05% significance)

Null hypothesis is accepted if the value of calculated r falls between the positive and negative value of the critical value of $-r$.

Since $-0.4394 < -0.36$, Null hypothesis is rejected. There is a significant negative relation between literacy rate and women who are pregnant or already mothers between the age of 15 and -19 years. This means, lower adolescent pregnancy rates seen when literacy among women is higher.

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3.2.2 Mothers who had at least 4 antenatal care visits

Antenatal care is crucial to detect complications early on in pregnancies and well as train mothers to detect warning signs, thus reducing the chances of injuries or death at the time of delivery and post-natal. As of 2020, the WHO recommends a minimum of at least 8 antenatal visits, however globally and regionally data for ‘at least 4 antenatal visit’ is available which was previously recommended²⁶.

TABLE-4 Average female literacy rate (%) and mothers who had at least 4 antenatal care visits (%) in the 30 districts of Odisha

	<u>AVERAGE FEMALE LITERACY (%)</u>	<u>MOTHERS WHO HAD AT LEAST 4 ANTENATAL CARE VISITS (%)</u>
Khorda	81.61	60.5
Jagatsinghpura	80.63	80.4
Cuttack	79.55	51
Kendrapara	78.96	53.1
Puri	78.28	81.8
Bhadrak	75.83	34.8
Nayagarh	72.05	58.1
Jajapur	73.29	50.8
Baleshwar	72.28	57.3
Jharsuguda	70.73	74.5
Dhenkanal	71.00	69.9
Anugul	68.64	68.4
Sambalpur	67.93	83
Bargarh	65.38	63.5
Subarnapur	64.04	85.3
Sundargarh	65.48	80.7
Debagarh	63.05	58.4
Baudh	59.79	73.4
Ganjam	61.13	51.3
Kendujhar	58.28	39.4
Balangir	53.50	76.5
Kandhamal	51.94	64.8

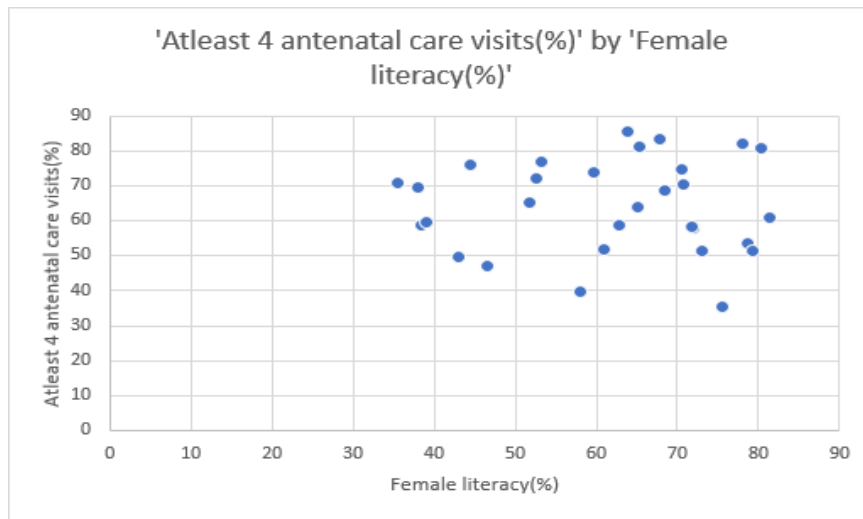
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Mayurbhanj	52.71	71.6
Kalahandi	46.68	46.7
Naupada	44.76	75.5
Gajapati	43.18	49.1
Rayagada	39.19	59.3
Korapat	38.55	58.4
Malkangiri	38.28	69.3
Nabarangapur	35.80	70.5

Source- Census 2011 and NFHS-4

Figure- 4 Scattered graph between [female](#) literacy rate (%) and at least 4 antenatal visits (%)



Source- Census 2011 and NFHS- 4

The calculated value of r from the given data set is $-0.000150.012$, upon applying fishers transformation, we get a range of 95% CI which is -0.3533 to 0.35 (Standard Error= 0.19).

Critical value of r is ± 0.36 (two-tailed test, 0.05% significance)

Null hypothesis is accepted, as the calculated value of r is not significant.

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3.2.3 Mothers who received post-natal care from a doctor/nurse/LHV/ANM/midwife/other health personnel within 2 days of delivery

According to WHO, nearly 75% of all maternal deaths are a result of complications that arise after childbirth². As the child gets much of the attention, the needs of a mother are often neglected or overshadowed. An hour after the delivery to until 6 weeks after, is considered as the post-partum period. Post-natal visits are also essential in immunizing the baby, reinforcing the importance of breast feeding to the mothers as well as monitoring the occurrence of any genital infections or assess excessive bleeding.

TABLE-5 Average [female](#) literacy rate (%) and mothers who received post-natal care by a professional within 2 days of delivery (%) in 30 districts of [Odisha](#)

	AVERAGE FEMALE LITERACY (%)	MOTHERS WHO RECEIVED POST NATAL CARE BY A PROFFESIONAL WITH 2 DAYS OF DELIVERY (%)
Khorda	81.61	70.9
Jagatsinghpura	80.63	92.6
Cuttack	79.55	68.7
Kendrapara	78.96	83.4
Puri	78.28	92.9
Bhadrak	75.83	62.3
Nayagarh	72.05	74.5
Jajapur	73.29	79.4
Baleshwar	72.28	72.2
Jharsuguda	70.73	88.6
Dhenkanal	71.00	81.9
Anugul	68.64	85.2
Sambalpur	67.93	74.4
Bargarh	65.38	80
Subarnapur	64.04	86.9
Sundargarh	65.48	78.9
Debagarh	63.05	71.2
Baudh	59.79	73.8
Ganjam	61.13	76.6
Kendujhar	58.28	58.9
Balangir	53.50	78.5
Kandhamal	51.94	68.9

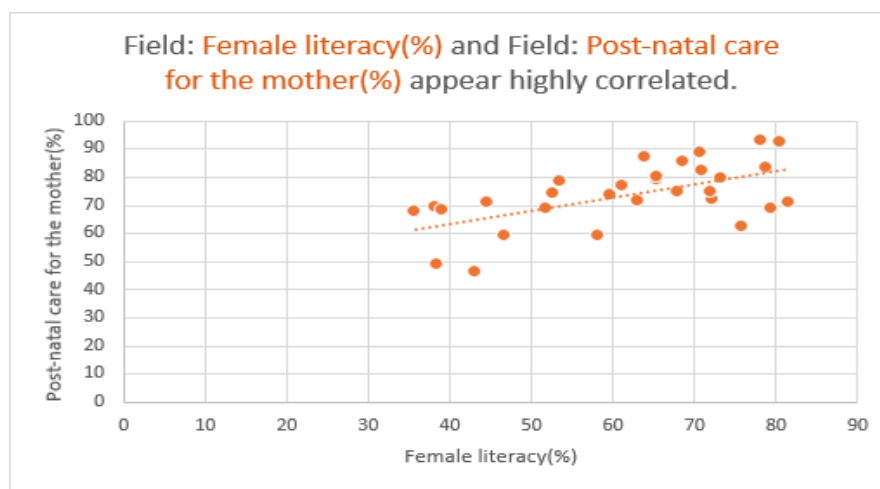
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Mayurbhanj	52.71	74.1
Kalahandi	46.68	58.8
Naupada	44.76	70.9
Gajapati	43.18	46.4
Rayagada	39.19	68.4
Korapat	38.55	49.1
Malkangiri	38.28	69.4
Nabarangapur	35.80	67.9

Source- Census 2011 and NFHS-4

Figure- 5 Scattered graph between [female](#) literacy rate (%) and Post natal care for mother (%) showing a high correlation



Source- Census 2011 and NFHS- 4

The calculated value of r from the given data set is [0.59260](#), upon applying fishers transformation, we get a range of 95% CI which is 0.29 to [0.781\(Standard Error=0.19\)](#)[65](#).

Critical value of r is ± 0.36 (two-tailed test, 0.05% significance)

0.59260 > 0.36 and does not fall within the range of critical r , hence null hypothesis is rejected. There is a significant positive relation between literacy rate and post natal care received by mothers

3.2.4 Institutional births

As per the NFHS-4 data, 78.9% of pregnant women give institutional births which has doubled in the last 10 years, but this increase does not necessarily translate into improvement in maternal mortality¹³. The government of India launched the JSY to promote institutional deliveries, but now also includes pre-natal and post-natal care in its program. At the same time, programs such as LaQshya have been initiated to improve the quality of labor rooms.

TABLE-6 Average female literacy rate (%) and Institutional births in 30 districts of Odisha

	AVERAGE FEMALE LITERACY (%)	INTITUTIONAL BIRTHS (%)
Khorda	81.61	85.1
Jagatsinghpura	80.63	97.6
Cuttack	79.55	94
Kendrapara	78.96	94
Puri	78.28	97.8
Bhadrak	75.83	87.4
Nayagarh	72.05	92.5
Jajapur	73.29	94
Baleshwar	72.28	91.9
Jharsuguda	70.73	95.2
Dhenkanal	71.00	90.1
Anugul	68.64	90.3
Sambalpur	67.93	90.3
Bargarh	65.38	92
Subarnapur	64.04	93
Sundargarh	65.48	88.3

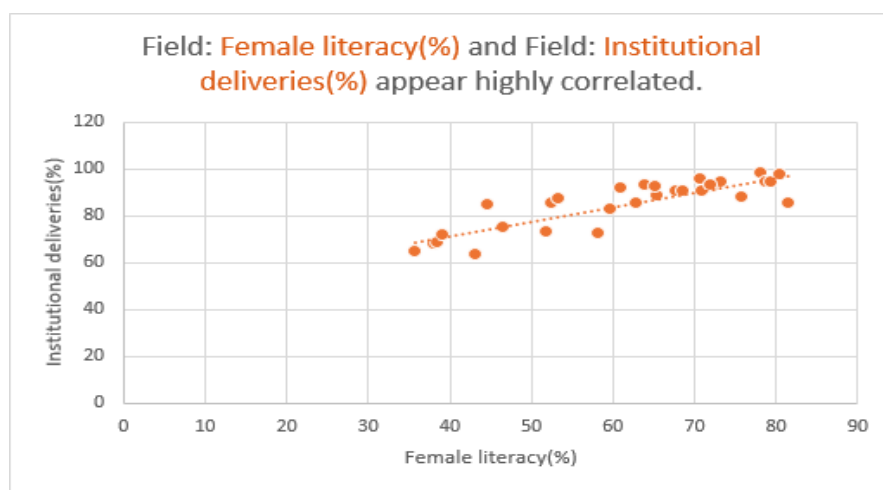
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Debagarh	63.05	85.3
Baudh	59.79	82.3
Ganjam	61.13	91.5
Kendujhar	58.28	72.2
Balangir	53.50	87.1
Kandhamal	51.94	72.7
Mayurbhanj	52.71	84.9
Kalahandi	46.68	74.5
Naupada	44.76	84.7
Gajapati	43.18	63.3
Rayagada	39.19	71.5
Korapat	38.55	68.4
Malkangiri	38.28	67.8
Nabarangapur	35.80	64.3

Source- Census 2011 and NFHS-4

Figure- 6 Scattered graph between [female](#) literacy rate (%) and Institutional deliveries showing high correlation



Source- Census 2011 and NFHS- 4

The calculated value of r from the given data set is 0.8577, upon applying fishers transformation, we get a range of 95% CI which is 0.7263 to 0.93733.

Critical value of r is ± 0.36 (two-tailed test, 0.05% significance)

0.857 > 0.36, which does not lie in the range of critical r value, hence null hypothesis is rejected. There is a significant positive association between literacy rate and Institutional births.

DISCUSSION

The 30 districts of Odisha have further been divided into North division, Central division And the South division and MMR for the divisions have been presented in AHS 2013,

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TABLE-7 Average literacy rate and MMR in the 3 geographical divisions of Odisha

	AVERAGE FEMALE LITERACY RATE (%)	MMR
NORTHERN DIVISION (Bargarh, Jharsuguda, Sambalpur, Debagraha, Sundargarh, Kendujhar, Dhenkanal, Anugul, Sonapur, Balangir)	64.873.93	212
CENTRAL DIVISION (Mayurbhanj, Baleshwar, Bhadrak, Kendrapara, Jagatsinghpur, Cuttack,	74.5181.51	222

Jajapur, Nayagarh, Khordha, Puri)		
SOUTHERN DIVISION (Ganjam, Gajapati, Kandhamal, Baudh, Nuapada, Kalahandi, Rayagada, Nabarangapur, Koraput, Malkangiri)	45.93 57.90	297

Based on the AHS 2011, the division with the lowest literacy rate also records the highest maternal [deaths](#) ²⁷.

As per the census 2011, Odisha also has the third highest tribal population in India which are mostly concentrated in the southern division of Odisha ¹⁴. The tribal population in districts such as Malkangiri, Nabarangpur, koraput, etc is as high as more than 50% of the total population of the region. The state government of Odisha has set up a special development council in the 9 southern districts with the aim of not only preserve the culture, dialect, resources but also bring about specific interventions in terms of development ²⁸ (*Times of India, 9 tribal districts get special development councils, March 2018*).

CONCLUSION

In the 30 districts of Odisha, some of which have a [high](#) tribal population, a significant association was seen between the average [female](#) literacy rate and adolescent marriage and pregnancy along with maternal health [care utilization](#) indicators such as post-natal care and institutional birth. However, no significant association was seen between literacy and antenatal care visits. The literacy rate was also lower among women in each respective region when compared to that of men, which means programs should concentrate on female [enrolment](#) into schools. Emphasis should also be given to health [education and](#) literacy.

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PART-2

**ONLINE COURSE REPORT ON- HUMAN RESOURCE FOR
PEOPLE MANAGEMENT: RECRUITING, HIRING AND
ONBOARDING EMPLOYEES**

BY UNIVERSITY OF MINNESOTA

1. Name of the Course:

- Human Resource For People Manager: Recruiting, Hiring And Onboarding Employees

By. University of Minnesota

2. Course Description:

- The quest for and recruitment of the right people is frequently cited as the number one issue of the businesses today. We also tend to be vying for the best and brightest staff. As you can see in our time together in the second course, a vital component of the People Manager Value Proposition is the recruitment of talented people who help the organization achieve its strategic goals. This course is an introduction to the topics of recruiting, placement, and onboarding.

The importance of balancing recruiting priorities with overall business strategy will be addressed at the beginning of the course. We then consider a set of options for successful and lawful recruiting and employee selection. Throughout the class we will look at current concerns related to talent acquisitions, such as how companies are now using social media and recruiting reviews to ensure better quality recruitment.

3. Objectives of the Course:

- To get a brief understanding of human resources
 - Recruitment.
 - Selection.
 - Onboarding.

4. Course Contents:

- Week 1 -Aligning Recruitment and Selection with Company Strategy
 - In this module, we will lay the important foundation for the course: aligning recruitment and selection practices with your overall strategy for the company. We will apply the system theory framework to explain the organization's interdependent elements, and how internal and external environmental factors impact our strategy. They will discuss the value of preparing the workforce and eventually conclude this section with a look at the key components of the recruiting process: role design, task analysis and job requirements.
- Week 2 - Recruitment: Finding the Best Candidates
 - Within this section we take a look at the strategic aspects of macro-level recruitment. We will also look at what makes an effective recruiter, and where to find prospective employees. Present recruitment issues, such as using social media and mobile devices, are addressed. We then take time to reflect on critical legal and ethical problems in recruiting, and we wrap up this section from a global viewpoint with a look at recruiting.
- Week 3 - Selection: Choosing the Best Candidates

- In this section, we discuss selection process. We start from the big picture like the first two modules-what is selection and how do we relate it to strategic goals? We will then discuss the relevant legal issues (U.S. laws) and other selection best practices, such as avoiding prejudices and carrying out background checks. First, we'll see numerous selection methods you can use to make a better hiring decision. Finally, we wrap up the third module by designing and presenting candidates' offers, and evaluating our efficiency hiring process.

➤ Week 4 - Special Topic: Onboarding

- In module four, we will be discussing bringing on your new hire. Once you've just recruited and hired a new employee, you want to make sure that the new employee gets up to speed as quickly as possible and becomes a committed and excited team member. Module four will discuss how to work through a great onboarding process, and why that matters to the engagement of an employee with the organization.

5. Learning Methodology used in the course:

- In this course, online learning provided by following:
- Lecture Videos
 - Reading Materials
 - Quizzes

6. Key Learnings from the Course:

➤ Week 1 -Aligning Recruitment and Selection with Company Strategy

- A brief introduction to the course was given to how system thought plays a role in recruitment and selection as a framework consisting of both internal

and external factors that, in effect, characterize the function of an organization.

There are 4 key system thought elements-

- 1) system can be open or close.
 - 2) system has interdependent parts that are interdependent and form a complex whole.
 - 3) system has input, throughput and output.
 - 4) environment feedback is required.
- Until recruitment and selection all aspects are seen in a program how the internal and external environment plays a role. External environment is seen on factors such as turnover, employee growth, current job profile, performance while external environment is observed on factors such as economy, rivals, replacement risks, the labor market, consumer demand, geography.
 - Workforce preparation plays a significant role, as recruiting and selection preparation takes place according to the needs and requirements after knowing the environment.
 - Core hire process components- Job Analysis, Job Descriptions, job specification. These are the most critical aspects of recruiting and selection process that would be chosen as the correct applicant if they are clearly understood by the applicant and clearly written and evaluated by the recruiter.

➤ Week 2 - Recruitment: Finding the Best Candidates

- Strategic planning is done before recruitment to successfully recruit these candidates- how many, where, who, when. There are different responsibilities of HR- target recruitment, environment and fit, strategies

& recruitment methods, recruitment method costs, recruitment method speed.

- Characteristics of effective recruiter-

- 1) Trustworthy,
- 2) Friendly,
- 3) Reasonable,
- 4) Affectable.

Technology plays a significant role in getting a large number of candidates based on the profile and how to handle derogatory comments circulating on the internet.

- To recruit a passive employee to improve the organisation. Passive employee is not actively pursuing a position, but an HR chooses to recruit him / her because of a particular skillset that helps a business grow. There are various ways to reach out to passive candidates, i.e. networking, quickly moving this, give them what they don't already have, on point emails.

➤ Week 3 - Selection: Choosing the Best Candidates

- Steps of selection process-

1. Screening applications.
2. Testing and reviewing work samples.
3. Interviewing Candidates.
4. Checking References.
5. Making selection & offer.
6. Acceptance and background check.

A recruiter should be very careful before selecting any candidate.

- Due to which biases exists, often decisions made will be swift. There are 5 types of biases occurring during the selection process- 1) biases of confirmation, 2) biases of group, 3) biases of contrast, 4) effect of halo, 5) Prejudice. Background checks include a person's work history, education, credit history, driving record, criminal record, medical history, use of social media and drug screening. Professional licenses Background checks, which simply verify that the applicant possesses a valid license.
- Selection tool model should be used before switching to selection tools to render accurate and effective selection tools. There are steps toward good hiring:
 - 1)Job Analyzes+ KSA+ skills+ JD.
 - 2)Determine the methods to use for selection.
 - 3)Method of behavior.
 - 4)Evaluating Applicants.
- Structured interviews are the best form of effective interviewing. A Predefined collection of questions may be a good predictor of success before interview. On the other hand, an applicant should be well prepared with all the necessary tags to ensure a smooth conduct of the interview.
- Candidate evaluation should be performed after interview so it would be a difficult job or at least to document the interview for late evaluation after having conducted all the interview and then deciding on the candidate. Any candidate evaluation form may be designed or adopted by HR team to evaluate a candidate with ratings & weights in it.

➤ Week 4 - Special Topic: Onboarding

- The onboarding of new hires is the process of integrating a new employee with an organization and its community as well as providing a new recruit

with the resources and knowledge required to become a successful team member.

- Tools for onboarding- checklists can be made before and after onboarding with any employee to ensure that the applicant is secure in an organisation.
- Once the applicant is onboard and they will be given individual progress plans to fill over a period of time in order to meet their desires and what else needs to be done to further improve.