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Burden Of Anemia And Its Socio-Economic Determinates Among Pregnant Women In Himachal Pradesh, India: A Cross-Sectional Study

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Abstract
Objective: *Although Much Effort Has Been Taken To Prevent Anemia In Indian Women, Still The Prevalence Of Anemia Was High In Women. The Study Is To Estimate The Prevalence/Burden Of Anemia Among Pregnant Women And To Determine Its Socio-Economic Determinants Among Pregnant Women In Himachal Pradesh.*
Methods: *The Data Were Derived From The National Family Health Survey Conducted In 2015-16. The Effective Sample Size Of The Present Paper Was 296 Women Aged 15-49 Years In Himachal Pradesh. Descriptive Statistics Along With Bivariate Analysis Is Conducted To Find Out The Preliminary Results. Additionally, Multivariable Logistic Regression Analysis Is Conducted To Find Out The Extent Of The Association Between Anemia Among Pregnant Women Along With Household Factors.*
Results: *Although Much Effort Has Been Taken To Prevent Anemia In Indian Women, Still The Prevalence Of Anemia During Pregnancy Is Found To Be 42.9% In Himachal Pradesh In This Study. It Depicts That The Highest Prevalence Of Anemia 72.2% Was In The Lahul & Spiti Districts And The Lowest 24% Was In The Kullu District. The Prevalence Of Anemia In Pregnant Women Was High In Lahul & Spiti Because Lahul Spiti Is A Remote Region Called A "Cold Desert" And It Is Virtually Cut Off In The Winter Due To Heavy Snowfall. Even The Lack Of Healthcare Facilities, Lack Of Awareness, And Lack Of Education Were Also Factors. In This Study, Results Depict That The Prevalence Of Anemia Is Higher In Low-Socioeconomic Pregnant Women As Compared To Middle And High-Socioeconomic Pregnant Women. Results Show That The Majority Of Anemic Women Were Illiterate (62.5%), Nearly 44% Of Anemic Women Belonged To The Rural Population May Be Related To The Inaccessibility Of Healthcare Centers, Transport, Poor Education And Awareness, Poor Lifestyle, And Poor Services. In The Present Study, The Majority Of Anemic Patients Belonged To The Age Group Of 15-19 Years (64.3%). This May Be Due To Early Marriage And Poor Birth Spacing In Reproductive-Age Women, Poor Dietary Patterns, And Poor Knowledge And Awareness Which Make Them More Prone To Anemia In Our Study. Results Depict That A High Prevalence Of Anemia Among Pregnant Non-Hindu Women (66.7%) As Compared With Hindu Women Was Observed In The Present Study. The Religion Itself May Not Be The Cause For This Finding, But Probably It Works Through Different Dietary Patterns, Food Taboos, And So On. In The Present Study, 69.2% Showed That Anemia Was More Prevalent In Women Having Obese BMI. It Can Be Hypothesized That Obesity Can Increase The Prevalence Of Anemia Because Of Increased Inflammation, And Increased Ferritin, Thereby Promoting The Sequestration Of Iron By Macrophages, And Reducing Iron Absorption From The Gut.*

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I. Background

An estimated 2.5 billion people worldwide suffer from anemia. Since ancient times, anemia has been a global public health issue, with the poor world having the highest prevalence (Roy, 2021) [1]. According to WHO projections, anemia affects 30% of women between the ages of 15 and 49, 37% of pregnant women, and 40% of children aged 6 to 59 months (WHO, 2023) [2]. IDA is diagnosed When the Hb concentration is below to be normal for the person's age, gender, and physiological state. Anemia during pregnancy has an impact on both the mother's and the unborn child's health and raises the possibility of preterm birth, intrauterine growth restriction, and low birth weight, all of which increase the risk of perinatal death. According to the World Health Organisation, eliminating anemia during pregnancy is a crucial part of becoming a safe mother. Given the great incidence of anemia, any unfavorable results for pregnant women and their unborn children would have a large negative effect on everyone's health (WHO, 2021) [3]. However, due to variations in socioeconomic situations, lifestyles, and health-seeking behaviors of different people across different nations and cultures, as well as the obstetrics and gynecological circumstances of pregnant women, there is a significant variation in the incidence of pregnancy anemia (Bharati, 2008) [4]. The pallor of the skin and conjunctiva, exhaustion, shortness of breath, and lack of appetite are some of the enigmatic and challenging symptoms of anemia. In fact, unless the anemia is quite severe, the clinical identification of anemia is poor due to the involvement of so many factors, including skin thickness

and pigmentation (WHO, 2001) [5]. Due to pregnancy's economic, societal, and health variables, anemia among pregnant women in poor nations is substantially greater than in advanced nations. By 2025, the WHO has set a global goal of reducing anemia among women of reproductive age by 50%. The World Health Organisation (WHO) estimates that iron deficiency anemia causes 1,15,000 maternal deaths worldwide each year (WHO, 2023) [2]. According to NFHS 2, and 3 report indicates 58% of pregnant women in India are anemic and it is estimated that anemia is the underlying cause of 20 -40% of cases of maternal deaths. The prevalence of anemia in pregnant women in Himachal Pradesh is 42.2% (NFHS-4) report. As Ladakh is characterized by poor vegetative cover and low plant production, especially in remote areas like Changthang, their diet is deficient in various essential nutrients, which frequently causes anemia and other deficiency diseases. The majority of Changpa women suffer from anemia, and children suffer from vitamin deficiencies.

Factors associated with anemia in pregnant women

Although there are several factors that might contribute to anemia, iron deficiency is by far the leading cause of nutritional anemia in the globe. Anaemia due to iron deficiency (IDA) is brought on by a number of reasons, including Low dietary availability, inadequate iron intake, high physiologic demands during pregnancy and early childhood, rapid growth spurts like adolescence, chronic iron loss from parasitic infections like hookworm and schistosomiasis, and vitamin B12, folic acid, and Vitamin A deficiency, educational level, family size, income, urban and rural region, not taking iron-folic acid supplements, gravidity, excess menstrual bleedings, history of abortion, are all contributing factors. In terms of epidemiology, parasitic illnesses including malaria, HIV, chronic inflammation, and protein-energy deficiency are crucial in separating IDA from other causes of anemia (Shome, 2006) [6]. Anaemia has adverse effects on one's health, society, and economy. Anaemia was evaluated using WHO standards.

Table 1.1 Classification of Anemia According to WHO, 2017

Age/ Population Group	Normal Value (g/dl)	ANEMIA SEVERITY(Hb)		
		Mild (g/dl)	Moderate (g/dl)	Severe (g/dl)
Pregnant Women	>11	10-10.9	7-9.9	<7
Children 6-59 months of age	>11	10-10.9	7-9.9	<7
Children 5-11 years of age	>11.5	11-11.4	8-10.9	<8
Children 12-24 years of age	>12	11-11.9	8-10.9	<8
Non-pregnant women (15 years of age and above)	>12	11-11.9	8-10.9	<8
Men, 15 years of age and above	>13	11-12.9	8-10.9	<8

(Source: WHO-Nutritional Anemia: Tools for Effective Prevention and Control, 2017)

Anaemia was defined as having a haemoglobin level in a pregnant woman of less than 110 g/L. Haemoglobin levels below 70, between 70 and 100, and between 100 and 109 g/L were regarded as signs of severe, moderate, and mild anemia in pregnant women, respectively. Even mild to moderate anemia has an impact on mood, leading to weariness and tension, which in turn lowers productivity and work capacity. In underdeveloped nations, severe anemia is a leading factor in maternal mortality and morbidity. While chronic anemia is thought to have a role in haemorrhage and infection issues, severe anemia has the potential to result in heart failure and mortality (WHO, 2023) [2]. **Strategies for Reduction of Anemia-** As a result, several initiatives have been by governments and non-governmental organizations worldwide to treat anemia. These efforts have taken a variety of forms, including short-term measures like supplementation and long-term approaches like food-based approaches, food fortification, dietary diversification, and nutrition education. The "Nutritional Iron Plus Initiative" was introduced by the Ministry of Health and Family Welfare in 2013 as part of a comprehensive plan to address the problem of iron deficiency anemia, which affects people of all ages (Nambiar, 2020) [7]. After the first trimester, every pregnant woman is given iron and folic acid to be taken 1 tablet daily for 6 months during the antenatal and postnatal periods. Universal anemia testing for expectant mothers. IEC, BCC, and nutrition education encourage dietary diversity and the inclusion of foods high in iron and folate that help in iron absorption (MOHFW, 2016) [8]. For the purpose of reporting severely anemic pregnant women, HIMS and MCTS are being used. Women who were pregnant received an MCP card and a booklet on healthy parenthood as learning materials. To enhance mother and child health outcomes, 184 High Priority Districts (HPDs) have been identified and given priority for RMNCHA+A activities (MOHFW, 2016) [9]. This study examines the prevalence of anemia among pregnant women in Himachal Pradesh. **Aim Of the study**-The study's goals are to quantify the incidence of anemia in pregnant women and identify the socioeconomic factors that influence this condition in pregnant women in Himachal Pradesh.

II. Methodology

Data

The data were derived from the National Family Health Survey (NHFS-5) which is conducted in 2019-2021. It offered details on population nutrition and health in India from each of the nation's states and union territories. Under the direction of the Ministry of Health and Family Welfare (MoHFW), the Indian government, all five rounds of the NFHS were carried out. The International Institute for Population Sciences (IIPS), Mumbai, has been chosen by MoHFW as the nodal organization for carrying out the surveys. Similar to NFHS-4, NFHS-5 offers district-level estimates for a number of significant metrics. To enable comparisons across time, the content of NFHS-5 is comparable to NFHS-4. The NFHS-5 does, however, introduce some new subjects, such as Death Registration, Preschool Education, Expanded Child Immunisation Domains, Components of Micronutrients to Children, Menstrual Hygiene, Methods and Reasons for Abortion, Frequency of Alcohol and Tobacco Use, An Additional Component of Non-Communicable Diseases (NCDs), and Expanded Age Range for Measuring Hypertension and Diabetes among All Aged 15 Years and Above. The NFHS-5 sample was created to offer estimates of several survey indicators at the national, state/union territory (UT), and district levels.

Estimates of indicators of sexual behavior, husband's background, and women's employment; knowledge, attitudes, and behaviors related to HIV/AIDS; and domestic violence, however, are only available at the state/UT and federal levels. NFHS-5 sample size decisions were influenced by a number of factors, the most important of which was the requirement to develop indicators at the district, state, and/or union territory (UT) levels. With regard to 707 districts, 28 states, and 8 union territories, NFHS-5 offers information. In each round of the poll, a consistent sample design that is representative at the national, state/union territory, and district levels was used. Each district is stratified into urban and rural areas.

Each rural stratum is divided into a smaller substrate based on the population of the village and the proportion of people who belong to the SC/ST (scheduled castes and scheduled tribes) castes. A sample of villages was chosen as Primary Sampling Units (PSUs) within each specific rural sampling stratum; prior to the PSU selection, PSUs were classified based on the literacy rate of women aged 6+ years. The mapping and household listing procedures completed in each chosen PSU before the household selection in the second stage resulted in the creation of the list of households. As of March 31st, 2017, a total of 30,456 Primary Sampling Units (PSUs) were chosen nationwide for the NFHS-5 study, drawn from 707 districts; 30,198 PSUs have already undergone fieldwork. A stratified two-stage sample is the NFHS-5 sample. The sampling frame used to choose the PSUs was the census from 2011.PSUs were Census Enumeration Blocks (CEBs) in urban regions and villages in rural areas.

Four survey schedules/questionnaires- Household, Woman, Man, and Biomarker -were canvassed in 18 local languages using Computer Assisted Personal Interviewing (CAPI). In the Household Questionnaire, information was collected on all usual members of the household and visitors who stayed in the household the night before the interview as well as socio-economic characteristics of the household; water, sanitation, and hygiene; health insurance coverage; disabilities; land ownership; the number of deaths in the household in the three years preceding the survey; and the ownership and use of mosquito nets. The Biomarker Schedule included measurements of children's height, weight, hip and waist circumference, hemoglobin levels, blood pressure, and random blood glucose levels for both women and men aged 15 and over. It also included children's height, weight, and hemoglobin level measurements. Men and women were also asked to give a few more drops of blood via a finger prick for lab testing of vitamin D3, malaria parasites, and HbA1c.

Basic demographic information including age, sex, marital status, education, possession of an Aadhaar card, use of cigarettes or alcohol, use of drugs, disability, and relationship to the head of the home, were gathered.

The Woman's Questionnaire collected information from all eligible women aged 15 -49, who were asked questions on a large variety of topics, including the following:

Background characteristics: age, literacy, schooling, religion, child ever born, household size, caste/tribe, media exposure, etc.

Reproduction: children ever born, birth history, current pregnancy, pregnancy terminations

Anaemia testing: Blood specimens for anemia testing were collected by health investigators from eligible women aged 15-49.

Other health concerns include the use of tobacco and alcohol, awareness of tuberculosis, and current morbidity (cancer, diabetes, heart disease, hypertension, asthma, goiter, and other thyroid problems). Decision-making in the home and anemia (State module subsample only).

Data Processing

Electronic data collected in the 2019-21 National Family Health Survey (NFHS) were received daily via the Sync Cloud system at the International Institute for Population Sciences, where the data were stored on a password-protected computer. The sample consisted of a total of 664,972 households, of which 653,144 were occupied. A total of 636,699 occupied households were successfully interviewed, yielding a 98 percent response rate.

In the interviewed households, 747,176 eligible women aged 15-49 were identified for individual women's interviews. Interviews were completed with 724,115 women, for a response rate of 97 percent. In all, there were 111,179 eligible men aged 15-54 in households selected for the state module. Interviews were completed with 101,839 men, for a response rate of 92 percent.

Variable description

Outcome variable:

The outcome variable was the presence of Any Anemia among pregnant women which was recorded as Yes or No.

Explanatory variable: the information related to the socio-demographic variables including the age of the respondents, educational level, children ever born, body mass index, religion caste, household size, wealth index, and place of residence (urban/rural) these data were extracted from the Demography health survey (DHS).

Individual characteristics: age was grouped into 15-19 years, 20-24 years, 25-29 years, 30-34 years, and 35-49 years. Educational status was categorized as No education, primary, secondary higher. Children ever born were categorized as zero, one, two, or more than two. Body Mass Index was coded as Thin, normal, overweight, and obese.

Household characteristics: The variable wealth status was generated using the information given in the NFHS 2019-21 survey. Household sizes were coded as 1 to 4 members, 5-8, and 9-15. Religions were coded as Hindus and non-Hindus. Caste was categorized as SC/ST, OBC, and Others. Wealth Index was coded as low, middle, and high. The place of residence was coded as urban and rural, and the religion of India was coded as north, central, east, northeast, west, and south.

Statistical analysis

All the analyses have been conducted using SPSS version 26. Descriptive and inferential statistics were performed at the initial stage. Frequencies and percentages distribution were used to analyze the demographic profile of the subjects. The Chi-square test was used to find the significance level for the prevalence estimates of Anemia among pregnant women by background characteristics. The logistic regression analysis was used to estimate the extent of association between anemia among pregnant women along with household factors. The binary logistic regression model usually put into a more compact form is as follows.

$$\text{Logit } [P(Y=1] = \beta_0 + \beta * X$$

The parameter β_0 estimates the log odds of anemia for the reference group, while β estimates the maximum likelihood, the differential log adds of anemia associated with a set of predictors X, as compared to the reference group.

III. Results:

This study was conducted to examine the prevalence of Anemia and Its Socioeconomic determinants among Pregnant Women in Himachal Pradesh, India. The secondary data method was employed to gather the data. The information was processed using SPSS version 26 and examined with the proper descriptive statistical techniques. The general findings of this investigation have been tabulated and in graphical form given under the following headings in this chapter. Analysis was conducted about the study's goal.

Table 1 shows the socioeconomic profile of pregnant women in Himachal Pradesh, India. It depicts that the majority of a group of the respondent 110(37.2%) were of the age group 25-29 years,108 (36.5%) from the 20-24 years of age group, 49 (16.6%) from the 30-34 years of age group,15 (5.1%) 0f 35-39 year of age group, followed by 14 (4.7%) of 15-19 years. Most of the respondents 173 (58.4%) were having secondary education and 94 (31.8%) were having higher education, 21(7.1%) were having primary education and 8(2.7%) had no education. Moreover, 152 (51.4%) of the women were not having any child, 86(29.1%) women were having one child and 58 women (19.6%) were having two or more children. The majority of respondents, 200 (67.6%), had a normal body weight, followed by 60 (20.3%) who were overweight, 22 (7.4%) who were lean, and 14 (5.4%) who were obese. In total, 269 (90.9%) of the participants were Hindus, while 27 (9.1%) were non-Hindus. Most of the 132(44.6%) participants were from other castes,118 (39.9%) were from SC/ST caste and 45(15.2%) were from OBC caste. In all, 144 (48.5%) participants had 5-8 family members, 132 (44.6%) had 1-4 family members, and 20 (6.8%) had 9–15 family members. Out of the 296 participants, 172(58.1%%) women had high wealth index, 63(21.3%) had middle and 61(20.6%) had low Wealth Index. Moreover,277(93.6%) participants were belonging to a rural area and 19(6.4%) participants were belonging to an urban area.

Figure 1 shows the prevalence of Anemic and Not Anemic Pregnant Women in India and Himachal Pradesh, 2019-21. It depicts that, 50.50% of pregnant women were Anemic and 49.50% were Not-Anemic in India, 42.90% were Anemic and 57.10% were Not-Anemic in Himachal Pradesh.

Figure 2 shows the Prevalence of Anemia among Pregnant Women, District wise In Himachal Pradesh, 2019-21. It depicts that the prevalence of anemia among pregnant women is higher at 72.20% in Lahul & Spiti as compared to 24% in Kullu District.

Table 2 shows the prevalence of anemia among pregnant women by Background Characteristics, in Himachal Pradesh, India. It was revealed that pregnant women in the age group of 15-19 had higher 64.3% anemia (Mild, moderate & Severe) followed by 30-34 had 49%,20-24 had 41.5%, 25-29 had 40% and 35-39 had 33.3% anemia. The findings show that 66.7% of pregnant women were not anemic in the age group of 35-39 followed by 60% were not anemic in the age group 25-29,58.5% were not anemic in the age group 20-24 & 35.7% were not anemic in the age group 15-19 and the (p-value) was (.358). According to their education status, the prevalence of anemia was higher at 62.5% among illiterate women and lowest at 37% among higher-educated pregnant women and the (p-value) was (.404). Their Body Mass Index indicated that 69.2% of obese women were anemic while 60.5% of normal body weight women were not, and the (p-value) was (.133). Their Religion indicates that 66.7% of non-Hindus were Anemic and 59.6% of Hindus were not Anemic and (p-value) was (.009). According to their caste, 52.3% of OBC were Anemic, and 59% of SC/ST caste women were not – Anemic, and (p-value) was (.401). In the group of households with 1-4 members, the prevalence of anemia was 44.6%, and in the group of households with 9–15 members, 60% Were not anemic and the (p-value) was (.855). Regarding the wealth status of the respondent's majority of the low wealth index, 44.3% were anemic, and 57.1% of the middle & high wealth index were not anemic, and (p-value) was (.967). According to their residents, pregnant women in rural areas were more likely to have anemia (44%), compared to pregnant women in urban areas (26.36%), and the (p-value) was (.132).

Table 3 presents the logistic regression estimates for pregnant women having Anemia by their independent characteristics. Pregnant Women aged 30-39 had significantly higher odds (OR=0.672), p-value (0.295) of having any anemia in comparison to women aged 25- 29 years. The odds of anemia among pregnant women with Secondary education had higher odds (OR= 0.851), with a p-value of (0.730) than women with Higher Education. The odds of having anemia among pregnant women with children ever born more than two had significantly higher odds (OR=2.289), p-value (0.049) in comparison to women with one child ever born. The odds of having anemia among pregnant women with Overweight had significantly higher odds (OR =1.913), a p-value of (0.029) in comparison to women with normal Body Mass Index. The odds of having anemia among pregnant women Non- Hindus Religion had significantly higher odds (OR=2.919), p-value (0.018) in comparison to the Hindu religion. The odds of anemia among pregnant women with SC/ST/OBC caste had significantly higher odds (OR=1.000) than other castes. The odds of having anemia among pregnant women were significantly higher in Rural area pregnant women's odds (OR=2.378), p-value (0.127) compared to Urban Area Pregnant Women.

IV. Discussion:

Although much effort has been taken to prevent anemia in Indian women, still the prevalence of anemia during pregnancy is found to be 42.9% in Himachal Pradesh in this study. It depicts that the highest prevalence of anemia 72.2% was in the Lahul & Spiti Districts and the Lowest 24% was in the Kullu District. The prevalence of anemia in pregnant women was high in Lahul & Spiti because Lahul Spiti is a remote region called a "cold desert" and it is virtually cut off in the winter due to heavy snowfall. Even the lack of healthcare facilities, lack of awareness, and lack of education were also factors. Similar results were obtained in a study by Romi Bansal *et al.* (81.8%), Gautam *et al*. (96.5%), Lokare *et al*. (87.2%), and Mangla and Singla (98%) [10]. A similar study conducted by the Nutrition Foundation of India and ICMR Task Force observed the prevalence of anemia as 84% and 84.9% among pregnant women, respectively [11].

It was evident that the prevalence of anemia increased as socioeconomic status declined. Thus, anemia during pregnancy is more likely to occur in people with lower socioeconomic levels. In this study, results depict that the prevalence of anemia is higher in low-socioeconomic pregnant women as compared to middle and high-socioeconomic pregnant women. On the contrary, in developed countries, the prevalence of anemia was only 18% among pregnant women as reported by the WHO [12]. Low anemia prevalence in industrialized nations is attributed to socioeconomic advancements, a greater standard of living, better use of healthcare resources, and rising literacy rates.

In the present study, the majority of anemic patients belonged to the age group of 15-19 years (64.3%). It is comparable to the studies by Ayano and Amentie,[13] Obai *et al*.,[14], and Getahun *et al*. [15] This may be due to early marriage and poor birth spacing in reproductive-age women, poor dietary patterns, and poor knowledge and awareness which make them more prone to anemia in our study. In this study, the majority of anemic women were illiterate (62.5%), Nearly 44% of anemic women belonged to the rural population while 26.3% to the urban population. The reason for the higher burden of anemia in rural pregnant women may be related to the inaccessibility of healthcare centers, transport, poor education and awareness, poor lifestyle, and poor services. However, lack of awareness about the factors causing anemia and possible strategies to prevent the risk factors of anemia plays a major role. It closely correlates with a study by Okube *et al*.,[16] Singh *et al*.,[17] Javed *et al*.,[18] where women of low socioeconomic groups had a higher prevalence of anemia.

Results depict that A high prevalence of anemia among pregnant non-Hindu women (66.7%) as compared with Hindu women was observed in the present study. The religion itself may not be the cause for this

finding, but probably it works through different dietary patterns, food taboos, and so on. Anemia was more prevalent among the women who have family size 1-8 (44.6%) as compared to women who have family size 9-15 (40%). There may be a direct relationship between family size with anemia due to food insecurity in large family sizes. Similarly, Sharma *et al*. [19] also showed a higher incidence of anemia in family size >2. In the present study, 69.2% showed that anemia was more prevalent in women having obese BMI. It can be hypothesized that obesity can increase the prevalence of anemia because of increased inflammation, and increased ferritin, thereby promoting the sequestration of iron by macrophages, and reducing iron absorption from the gut.

V. Conclusion:

The main factors that influence the anemia issue are women's socioeconomic level and literacy rates. Education is the fundamental element in transformation. Women's education alone won't result in any good changes, but raising the family's level of reading will undoubtedly aid in resolving this issue. Government should develop strategies and programs to improve women's education so they may become independent in the socioeconomic and cultural decisions, which have a direct and indirect impact on women's health. Some strategies for preventing anemia have been put forth, including iron-folic acid supplements, health awareness campaigns, frequent visits by Anganwadi workers to expectant mothers, cooking with iron cookware, fortifying food with iodized salt, and anemia screening programs. Such actions would significantly enhance both the health of the mother and the unborn child. All of these initiatives would contribute to ensuring safe motherhood and achieving the Millennium development goals.

VI. Recommendations:

1) Women should be encouraged and counselled to eat a more variety of extra meals and iron-rich foods than usual to prevent the occurrence of anemia.
2) Pregnant women should get ongoing information and counseling to use the free hemoglobin estimation service offered by rural and urban health centers.
3) Advice to pregnant women take the National iron plus initiative recommends iron folic acid [IFA] supplementation of 100 mg elemental iron and 500 µg of folic acid every day for at least 100 days starting after the first trimester at 14–16 weeks of gestation for all non-anemic pregnant women followed by the same dose for 100 days postpartum.
4) This public health issue can be brought to the attention of the public by setting up awareness camps, patient group meetings, and social media use.
5) Healthcare professionals across the nation participated in the observance of "National Anaemia Awareness and Treatment Day" to target vulnerable populations, particularly the nation's youth and pregnant women.

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Table 1: The Burden of Anemia among Pregnant Women in Himachal Pradesh, India: Evidence from Fifth Indian Demographic Health Survey

Background Characteristics	**Number (n)**	**Percentage (%)**
Age		
15-19	14	4.7
20-24	108	36.5
25-29	110	37.2
30-34	49	16.6
35-39	15	5.1
Educational Level		
No education	8	2.7
Primary	21	7.1
Secondary	173	58.4
Higher	94	31.8
Children Ever Born		
0	152	51.4
1	86	29.1
>=2	58	19.6
BMI		
Thin	22	7.4
Normal	200	67.6
Overweight	60	20.3
Obese	14	5.4
Religion		
Hindu	269	90.9
Non-Hindus	27	9.1
Caste		
SC/ST	118	39.9
OBC	45	15.2
Others	132	44.6
Household Size		
1-4	132	44.6
5-8	144	48.6
9-15	20	6.8
Wealth Index		
Low	61	20.6
Middle	63	21.3
High	172	58.1
Residence		
Urban	19	6.4
Rural	277	93.6
Total	**296**	**100**

Figure 1: Prevalence of Anemic and not Anemic Pregnant Women in India and Himachal Pradesh, 2019-21

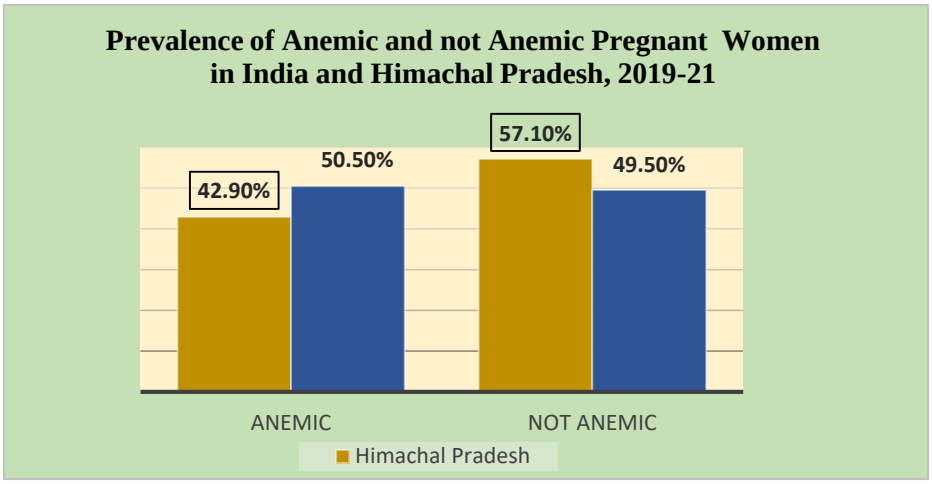

Figure 2: Prevalence of Anemia among Pregnant Women by District wise, Himachal Pradesh, 2019-21

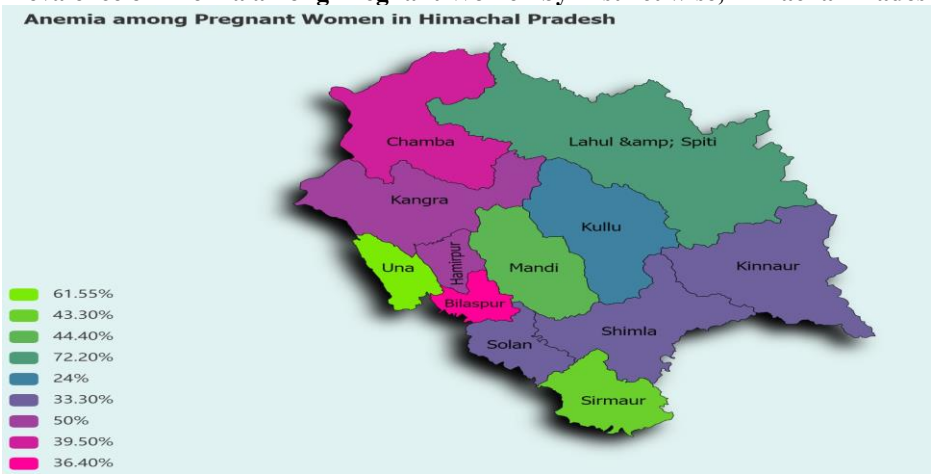

Table 2: Prevalence of Anemia among Pregnant Women by Background Characteristics, Himachal Pradesh, India, 2019-21

Background Characteristics	Anemic	Not-Anemic	P-value
Age			
15-19	64.3%	35.7%	0.358
20-24	41.5%	58.5%	
25-29	40.0%	60.0%	
30-34	49.0%	51.0%	
35-39	33.3%	66.7%	
Educational Level			
No education	62.5%	37.5%	0.404
Primary	42.9%	57.1%	
Secondary	45.1%	54.9%	
Higher	37.0%	63.0%	
Children Ever Born			
0	36%	64.0%	0.050
1	48.8%	51.2%	
>=2	51.7%	48.3%	
BMI			
Thin	40.9%	59.1%	0.133
Normal	39.5%	60.5%	
Overweight	49.2%	50.8%	
Obese	69.2%	30.8%	
Religion			
Hindu	40.4%	59.6%	**0.009**
Non-Hindus	66.7%	33.3%	
Caste			

SC/ST	41.0%	59.0%	0.401
OBC	52.3%	47.7%	
Others	41.7%	58.3%	
Household Size			
1-4	44.6%	55.4%	0.855
5-8	41.7%	58.3%	
9-15	40.0%	60.0%	
Wealth Index			
Low	44.3%	55.7%	0.967
Middle	42.9%	57.1%	
High	42.4%	57.1%	
Residence			
Urban	26.3%	73.7%	0.132
Rural	44.0%	56.0%	
Total	**42.9%**	**57.1%**	**296**

Table 3: Odds of any Anemia among Pregnant Women by Independents variables, India, 2019-21

Independent Variables	Odds Ratio	95% Confidence interval		p-value
Age				
15-24	1.000			
25-29	0.619	0.345	1.109	0.107
30-49	0.672	0.319	1.415	0.295
Educational Level				
Primary	1.000			
Secondary	0.851	0.340	2.130	0.730
Higher	0.637	0.219	1.832	0.400
Children Ever Born				
0	1.000			
1	2.324	1.223	4.416	0.010
>=2	2.289	1.003	5.226	0.049
BMI				
Normal	1.000			
Overweight	1.913	1.067	3.427	0.029
Religion				
Hindus	1.000			
Non-Hindus	2.919	1.199	7.108	0.018
Caste				
SC/ST/OBC	1.000			
Others	0.991	0.600	1.636	0.971
Household Size				
1-4	1.000			
>=4	0.708	0.415	1.206	0.204
Wealth Index				
Low	1.000			
Middle	1.024	0.475	2.210	0.952
High	1.389	0.670	2.876	0.377
Residence				
Urban	1.000			
Rural	2.378	0.781	7.242	0.127