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Iron Deficiency Anemia and Associated Factors in Non-Pregnant, Non-Working Females of Reproductive Age in a Tertiary Military Hospital

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Abstract

Background: Iron deficiency anaemia (IDA) remains a major public health concern among women of reproductive age, yet data on non-pregnant, non-working women—a nutritionally vulnerable subgroup—are limited. This study assessed the prevalence and associated factors of IDA in women attending a tertiary military hospital in Bangladesh.

Methods: A retrospective observational study was conducted at Combined Military Hospital, Dhaka from January, 2025 to December, 2025 among 336 non-pregnant, non-working women aged 15–49 years. IDA was defined as haemoglobin <12 g/dL with at least two abnormal iron indices. Data on demographic, reproductive, medical, surgical, and haematological parameters were extracted from medical records. Associations between anaemia severity and key variables were examined using Chi-square tests.

Results: The mean age of participants was 35.18 ± 7.22 years; 78.6% reported menorrhagia and 39.3% had a history of one abortion. Moderate anaemia was most common (64.3%). Significant associations were observed between anaemia severity and number of abortions ($\chi^2 = 40.58$, $P < 0.001$), contraceptive method—particularly IUD use ($\chi^2 = 49.19$, $P < 0.001$)—and number of major surgeries ($\chi^2 = 15.81$, $P < 0.001$). No significant associations were found with menorrhagia, PPH, PPI use, anthelmintic use, stool occult blood test, or transfusion history. Iron indices confirmed severe iron depletion, with mean ferritin 8.29 ± 3.28 ng/mL and transferrin saturation 6.68 ± 3.44%.

Conclusion: IDA in non-pregnant women reflects a multifactorial pattern influenced more by reproductive and surgical history than by menstrual factors alone. Targeted screening and reproductive health interventions are warranted.

Keywords: Iron deficiency anaemia, reproductive-age women, contraceptives, abortions

Introduction

Anaemia remains one of the most pervasive global public health challenges, affecting over a quarter of the world's population and disproportionately impacting women of reproductive age.[1] The World Health Organization identifies anaemia as a condition of public health significance in nearly

all low- and middle-income countries, with South Asia bearing one of the highest regional burdens. Iron deficiency accounts for approximately half of all anaemia cases worldwide, underscoring its primacy as the leading cause of anaemia.[2] Women of reproductive age are particularly vulnerable due to biological factors such as menstrual blood loss, pregnancy, lactation, and increased iron requirements during reproductive years.[3] In regions where dietary iron intake is inadequate and healthcare access is limited, these physiological demands are further amplified, leading to a sustained cycle of deficiency and anaemia.

In Bangladesh and other South Asian nations, the prevalence of anaemia among women remains substantially higher than the global average. The Bangladesh Demographic and Health Survey (BDHS) and several subsequent analyses have consistently reported anaemia prevalence between 40% and 45% among women of reproductive age.[2,4] Such rates signify a severe public health problem by WHO standards. The aetiology of anaemia in Bangladeshi women is multifactorial, involving dietary insufficiency, iron bioavailability constraints, chronic blood loss, infections, and comorbid health conditions.[3,5] The persistence of anaemia across decades, despite public health interventions, suggests that nutritional and environmental determinants continue to play a dominant role, especially in rural and socioeconomically disadvantaged groups.[5,6]

Physiologically, women of reproductive age are predisposed to iron depletion due to monthly menstrual losses, hormonal fluctuations, and the cyclical demands of reproduction. Excessive or irregular menstrual bleeding (menorrhagia) significantly increases the risk of iron deficiency, and repeated pregnancies without adequate recovery intervals further deplete iron stores.[7] Postpartum haemorrhage and abortions are also known contributors to cumulative blood loss, exacerbating anaemia in non-pregnant women and those not engaged in formal employment, who may have limited dietary diversity and health-seeking opportunities.[8] In Bangladesh, studies among rural women indicate that chronic iron depletion often predates pregnancy, leading to compounded risks during gestation and postpartum periods.[9,10] This underscores the importance of early identification and management of iron deficiency in non-pregnant, reproductive-aged women to prevent future obstetric and systemic complications.

Iron deficiency anaemia (IDA) represents the most clinically significant subtype of anaemia, defined by depleted iron stores leading to impaired erythropoiesis and reduced haemoglobin synthesis. The pathophysiology of IDA involves a cascade of changes beginning with diminished serum ferritin, followed by reduced serum iron and transferrin saturation, increased total iron-binding capacity (TIBC), and ultimately microcytic, hypochromic red blood cells reflected by decreased mean corpuscular volume (MCV) and mean corpuscular haemoglobin (MCH) with elevated red cell distribution width (RDW).[11] Accurate diagnosis therefore necessitates an integrated assessment of both haematological and biochemical parameters rather than reliance on haemoglobin levels alone.[12] This approach is critical in settings like Bangladesh, where a high proportion of anaemic individuals may not exhibit classical biochemical markers of iron deficiency due to confounding factors such as inflammation, malnutrition, or concurrent infections.[13] Clinically, untreated IDA contributes to reduced physical endurance, cognitive impairment, decreased work productivity, and increased susceptibility to infections.[7]

Environmental and dietary factors exacerbate the burden of IDA in Bangladeshi women. The majority of the population subsists on cereal-based diets with limited consumption of animal-source foods, resulting in poor dietary iron bioavailability.[3] Cultural practices and socioeconomic limitations restrict access to heme iron sources, while concurrent deficiencies in vitamins such as A, B12, and folate may compound anaemia severity.[10] Gastrointestinal conditions that impair

iron absorption, including chronic gastritis and prolonged proton pump inhibitor (PPI) use, have been implicated in IDA pathogenesis among women in developing countries.[14] Moreover, malabsorption disorders and chronic occult gastrointestinal blood loss contribute to persistent iron depletion despite adequate intake. A hospital-based study in Bangladesh reported that nearly 18% of IDA patients had helminth ova or cysts detected in stool samples, and 12% tested positive for occult blood, highlighting gastrointestinal blood loss as an under-recognized contributor.[14] Soil-transmitted helminths, prevalent in rural Bangladesh, cause chronic intestinal blood loss and inflammation, further exacerbating iron deficiency.[15]

Despite significant national progress in maternal and child health, there remains a critical evidence gap concerning anaemia among non-pregnant, non-working women, a subgroup often nutritionally vulnerable, with limited access to healthcare or supplementation programs.[16] Most surveillance and intervention efforts in Bangladesh target pregnant women and children, overlooking the substantial burden among women outside these groups. This omission is consequential, as these women often enter pregnancy with pre-existing iron deficiency, compounding maternal morbidity risks.[5] Hospital-based studies examining this population remain sparse, and few have comprehensively assessed both haematological and biochemical indicators of iron deficiency. The present study therefore aims to investigate the prevalence of iron deficiency anaemia and its associated factors among non-pregnant, non-working women of reproductive age in a tertiary military hospital in Bangladesh. By integrating demographic, reproductive, clinical, and laboratory parameters, this research seeks to fill an existing knowledge gap and provide an evidence base for targeted screening and preventive interventions in this overlooked female demographic.

Methods

This retrospective, single-centre observational study was conducted in Combined Military Hospital, Dhaka, Bangladesh, using medical records of women of reproductive age who attended outpatient or inpatient services from January, 2025 to December, 2025. The target population comprised non-pregnant, non-working females aged 15–49 years with a diagnosis of iron deficiency anaemia (IDA) and complete clinical and laboratory documentation. A census-type sampling approach was used: all consecutive records meeting the eligibility criteria within the study period were reviewed, and 336 women fulfilled the inclusion criteria and were retained for analysis. Eligible cases were non-pregnant, non-working women aged 15–49 years with haemoglobin (Hb) < 12 g/dL plus at least two additional abnormalities among: serum ferritin < 15 ng/mL, serum iron < 60 µg/dL, transferrin saturation < 15%, mean corpuscular volume (MCV) < 80 fL, mean corpuscular haemoglobin (MCH) < 27 pg, and red cell distribution width (RDW) > 14.5%. Women with documented alternative causes of anaemia (for example, haemolytic anaemia, megaloblastic anaemia, thalassaemia or other haemoglobinopathies), pregnancy at the time of evaluation, or incomplete key data were excluded. Anaemia severity was categorised as mild (Hb 10.0–11.9 g/dL), moderate (Hb 7.0–9.9 g/dL) or severe (Hb < 7.0 g/dL). Data were extracted using a structured form and included age, age at menarche, history of menorrhagia, number of offspring, mode of previous deliveries (normal vaginal delivery or caesarean section), history of postpartum haemorrhage, number of abortions, recent abortion (within six months), and recent contraceptive use by method. Medical and surgical history comprised regular anthelmintic use, number of other major surgeries, presence and type of comorbidities (for example, diabetes mellitus, hypertension, hypothyroidism or combinations), proton pump inhibitor (PPI)

use and duration, history of malabsorption, and prior blood transfusion. Laboratory data included Hb, MCV, MCH, RDW, serum ferritin, serum iron, total iron-binding capacity (TIBC), transferrin saturation, stool occult blood test (OBT) result, and, where available, stool microscopy findings for helminths; all were generated in the hospital's central laboratory using standard automated analyzers, and the study used the values recorded at the index visit. Data were entered into SPSS (version 26), cleaned, and analyzed using descriptive statistics: continuous variables were summarized as mean ± standard deviation, and categorical variables as frequencies and percentages. Associations between anaemia severity and categorical explanatory variables (for example, menorrhagia, postpartum haemorrhage, number of abortions, contraceptive method, comorbidities, anthelmintic use, PPI use, prior transfusion, OBT status, and number of other major surgeries) were explored with cross-tabulations and Chi-square tests or Fisher's exact test where appropriate; a P-value < 0.05 was considered statistically significant. The protocol was approved by the institutional ethics committee of the hospital; as this was a retrospective record-based study with no direct patient contact, informed consent was waived, and all data were anonymised prior to analysis.

Results

The baseline characteristics of the 336 study participants show that the majority of women were in the 36–49-year age group (57.1%), with a mean age of 35.18 ± 7.22 years. Most participants experienced menarche after 12 years of age (60.7%), with a mean menarcheal age of 13.29 ± 1.45 years. Regarding reproductive history, three-quarters of the women had one to two offspring (75.0%), while 21.4% had three or more, and only 3.6% were nulliparous; the mean number of children was 2.23 ± 0.58. Half of the participants had no history of normal vaginal delivery (50.0%), and 46.4% had undergone two Caesarean sections, indicating a high proportion with surgical deliveries. Abortion history varied, with 42.9% reporting no abortions, 39.3% reporting one, and smaller proportions reporting two (10.7%) or three (7.1%) prior abortion events. [Table 1].

The majority of participants reported a history of menorrhagia, with 78.6% experiencing heavy menstrual bleeding, reflecting a substantial burden of menstrual blood loss among the study population. Postpartum haemorrhage was less common, documented in 14.3% of women. Abortion history varied widely: 42.9% had no prior abortions, while 39.3% had one and smaller

Table 1: Baseline characteristics of the study participants ($N = 336$)

Variable	*n* (%)
Age (years)	
Mean ± SD	35.18 ± 7.22
Age at menarche (years)	
≤12 years	132 (39.3)
>12 years	204 (60.7)
Mean ± SD	13.29 ± 1.45
Number of offspring	
0	12 (3.6)
1–2	252 (75.0)
≥3	72 (21.4)
Mean ± SD	2.23 ± 0.58
Number of normal vaginal deliveries (NVD)	
0	168 (50.0)
1	48 (14.3)
2	108 (32.1)
3	12 (3.6)
Number of Caesarean sections	
0	120 (35.7)
1	60 (17.9)
2	156 (46.4)
Number of abortions	
0	144 (42.9)
1	132 (39.3)
2	36 (10.7)
3	24 (7.1)

proportions had two (10.7%) or three (7.1%) abortions, indicating repeated reproductive events that may contribute to cumulative iron loss. Contraceptive use patterns showed condom use as the most prevalent method (53.6%), followed by non-use in 21.4% of participants. Hormonal and long-term methods were less common, with 10.7% using oral pills and 7.1% each using either intrauterine devices or sterilization through ligation [Table 2].

Most women did not take anthelmintics regularly (85.7%), suggesting limited routine deworming practices in this cohort. A small proportion had a history of blood transfusion (7.1%), and similarly, 7.1% had a positive stool occult blood test, indicating possible gastrointestinal blood loss. Proton pump inhibitor use was frequent, with 64.3% using them occasionally and 35.7% using them regularly, and duration of regular PPI use varied from one to five months among those who used them consistently. Comorbidities were notable: diabetes mellitus alone accounted for 28.6% of participants, while an equal proportion had coexisting diabetes and hypothyroidism; 7.1% had subclinical hypothyroidism, and 10.7% had hypertension, whereas 25.0% reported no comorbid conditions. Surgical history showed that 82.1% of participants had undergone two major surgeries, with only 17.9% having had one, suggesting substantial prior surgical exposure in the group [Table 3].

Table 2: Menstrual and gynecological history of participants ($N = 336$)

Variable	*n* (%)
History of menorrhagia	
Yes	264 (78.6)
No	72 (21.4)
History of postpartum hemorrhage (PPH)	
Yes	48 (14.3)
No	288 (85.7)
Number of abortions	
0	144 (42.9)
1	132 (39.3)
2	36 (10.7)
3	24 (7.1)
Recent use of contraceptives	
Condom	180 (53.6)
No use	72 (21.4)
Oral pill	36 (10.7)
IUD	24 (7.1)
Ligation	24 (7.1)

Table 3: Medical and surgical history of participants ($N = 336$)

Variable	*n* (%)
Takes anthelmintics regularly	
Yes	48 (14.3)
No	288 (85.7)
History of blood transfusion	
Yes	24 (7.1)
No	312 (92.9)
Stool for occult blood test (OBT)	
Positive	24 (7.1)
Negative	312 (92.9)
Takes PPI	
Occasionally	216 (64.3)
Regularly	120 (35.7)
Comorbidity	
Diabetes mellitus	96 (28.6)
Diabetes mellitus, Hypothyroidism	96 (28.6)
Diabetes mellitus, Subclinical	24 (7.1)
Hypertention	36 (10.7)
None	84 (25.0)
Number of other major surgeries	
1	60 (17.9)
2	276 (82.1)
Duration of regular PPI use (months)	
0	216 (64.3)
1	12 (3.6)
2	12 (3.6)
3	48 (14.3)
4	36 (10.7)
5	12 (3.6)

The hematological and biochemical parameters of the participants reflect a consistent pattern of iron deficiency anaemia. Mean haemoglobin was markedly reduced at 9.71 ± 1.40 g/dL, with values ranging from 6.3 to 11.5 g/dL. Red cell indices demonstrated classic microcytic–hypochromic changes: the mean MCV was low at 71.15 ± 7.29 fL and the mean MCH was similarly reduced at 22.51 ± 2.90 pg. RDW was elevated (mean 17.65 ± 2.82%), indicating significant anisocytosis consistent with iron-deficient erythropoiesis. Iron profile markers further supported depleted iron stores, with serum ferritin averaging only 8.29 ± 3.28 ng/mL and serum iron measuring 24.36 ± 10.29 µg/dL. Compensatory increases in iron-binding capacity were evident, with mean TIBC elevated at 394.14 ± 93.23 µg/dL. Transferrin saturation was profoundly reduced, with a mean of 6.68 ± 3.44%, underscoring severely limited circulating bioavailable iron [Table 4].

The distribution of anaemia severity showed that most participants were moderately anaemic, representing 64.3% of the cohort. Mild anaemia was observed in 21.4% of women, while 14.3% were classified as severely anaemic with haemoglobin levels below 8 g/dL [Table 5].

Table 6 shows the distribution of menstrual and gynaecological factors across anaemia severity categories among women with iron deficiency anaemia. Menorrhagia was highly prevalent in all groups, affecting 78.9% of moderately anaemic and all severely anaemic women, although its association with severity was not statistically significant ($P = 0.266$). A history of postpartum haemorrhage was reported only among women with moderate anaemia (21.1%), but this pattern also did not reach statistical significance ($P = 0.110$). In contrast, the number of abortions was strongly associated with anaemia severity ($P < 0.001$): mild cases were predominantly seen in women with no abortions (66.7%), whereas severe anaemia clustered in women with three abortions (66.7%). Recent contraceptive use also showed a significant association with severity ($P < 0.001$). Mild anaemia was most common among condom and oral pill users, moderate anaemia was frequent across condom, ligation and non-use groups, while severe anaemia

Table 4: Hematological and iron profile of the participants ($N = 336$)

Parameter	Minimum	Maximum	Mean ± SD
Hemoglobin, Hb (g/dL)	6.3	11.5	9.71 ± 1.40
Mean corpuscular volume, MCV (fL)	53.8	81.8	71.15 ± 7.29
Mean corpuscular hemoglobin, MCH (pg)	14.5	27.4	22.51 ± 2.90
Red cell distribution width, RDW (%)	15.2	27	17.65 ± 2.82
Serum ferritin (ng/mL)	4	19	8.29 ± 3.28
Serum iron (µg/dL)	6	47	24.36 ± 10.29
Serum total iron-binding capacity, TIBC (µg/dL)	231	549	394.14 ± 93.23
Transferrin saturation (%)	1	15	6.68 ± 3.44

Table 5: Severity of anaemia and iron deficiency anaemia ($N = 336$)

Variable	Category	*n* (%)
Severity of anaemia	Mild (11–11.9 g/dL)	72 (21.4)
	Moderate (8–10.9 g/dL)	216 (64.3)
	Severe (<8 g/dL)	48 (14.3)

occurred predominantly in women using intra-uterine devices (66.7%) [Table 6].

Table 7 examines the relationship between anaemia severity and key medical and surgical factors. Proton pump inhibitor (PPI) use showed no meaningful association with severity, as the distribution of occasional and regular use was nearly identical across mild, moderate, and severe groups (P = 0.968). Regular anthelmintic use was reported only among women with moderate anaemia (21.1%), though this trend did not reach statistical significance (P = 0.110). Similarly, neither history of blood transfusion nor stool occult blood positivity demonstrated significant associations with anaemia severity, with all severe cases occurring exclusively among women without these findings (P = 0.361 for both comparisons). In contrast, the number of other major surgeries showed a strong and statistically significant association with severity (P < 0.001). Mild anaemia was more common among women with a single major surgery (33.3%), whereas moderate anaemia clustered overwhelmingly among those with two surgeries (94.7%). Severe anaemia showed a split pattern, with two-thirds of cases occurring among women with only one major surgery [Table 7].

Discussion

The present study explored the prevalence and determinants of iron deficiency anaemia (IDA) among non-pregnant, non-working women of reproductive age attending a tertiary military hospital in Bangladesh. The findings revealed a multifactorial landscape of anaemia, reflecting an interplay of biological, reproductive, and lifestyle factors within this vulnerable subgroup. The mean age of the participants was 35.18 ± 7.22 years, similar to previous South Asian studies reporting anaemia predominance among women in their thirties and forties, when cumulative reproductive and nutritional stress peaks.[17] Most women in the present study had menarche after 12 years of age

Table 6: Menstrual and gynecological factors among women with iron deficiency anaemia (N = 336)

Category	Mild *n* (%)	Moderate n (%)	Severe *n* (%)	χ^2 (df)	*P*-value
Menorrhagia					
Yes	48 (66.7)	180 (78.9)	36 (100.0)	2.65 (2)	0.266
No	24 (33.3)	48 (21.1)	0 (0.0)		
Postpartum haemorrhage (PPH)					
Yes	0 (0.0)	48 (21.1)	0 (0.0)	4.42 (2)	0.110*
No	72 (100.0)	180 (78.9)	36 (100.0)		
Number of abortions					
0	48 (66.7)	96 (42.1)	0 (0.0)	40.58 (6)	<0.001
1	24 (33.3)	96 (42.1)	12 (33.3)		
2	0 (0.0)	36 (15.8)	0 (0.0)		
3	0 (0.0)	0 (0.0)	24 (66.7)		
Recent use of contraceptives					
Condom	48 (66.7)	120(52.6)	12 (33.3)	49.19 (8)	<0.001
IUD	0 (0.0)	0 (0.0)	24 (66.7)		
Ligation	0 (0.0)	24 (10.5)	0 (0.0)		
No use	0 (0.0)	72 (31.6)	0 (0.0)		
Oral pill	24 (33.3)	12 (5.3)	0 (0.0)		

Table 7: Association between severity of anaemia and medical and surgical factors ($N = 336$)

Category	Mild *n* (%)	Moderate *n* (%)	Severe *n* (%)	χ^2 (df)	*P*-value
Use of PPI					
Occasionally	48 (66.7)	144(63.2)	24 (66.7)	0.07 (2)	0.968
Regularly	24 (33.3)	84 (36.8)	12 (33.3)		
Regular anthelmintic use					
Yes	0 (0.0)	48 (21.1)	0 (0.0)	4.42 (2)	0.110*
No	72 (100.0)	180 (78.9)	36(100.0)		
History of blood transfusion					
Yes	0 (0.0)	24 (10.5)	0 (0.0)	2.04 (2)	0.361
No	72 (100.0)	204 (89.5)	36 (100.0)		
Stool occult blood test (OBT)					
Positive	0 (0.0)	24 (10.5)	0 (0.0)	2.04 (2)	0.361
Negative	72 (100.0)	204 (89.5)	36 (100.0)		
Number of other major surgeries					
1	24 (33.3)	12 (5.3)	24 (66.7)	15.81 (2)	<0.001
2	48 (66.7)	216 (94.7)	12 (33.3)		

and were multiparous, patterns consistent with national demographic trends suggesting delayed menarche and high parity among Bangladeshi women.[18,19] Multiparity and repeated pregnancies contribute to chronic iron depletion due to inadequate postnatal recovery and cumulative blood loss, aligning with regional findings from Afghanistan and Nepal where anaemia risk increased sharply with each successive childbirth.[17]

A striking 78.6% of participants in this study reported menorrhagia, underscoring the reproductive burden faced by women in this demographic. However, the absence of a statistically significant association between menorrhagia and anaemia severity suggests that while heavy menstrual bleeding is a common risk factor, it may not uniformly determine the degree of anaemia. Similar inconclusive results have been reported in guideline reviews where variability in self-reported bleeding volume and compensatory iron absorption mechanisms diminished apparent statistical associations.[12] Conversely, postpartum haemorrhage (PPH) and number of abortions emerged as more consistent predictors of anaemia severity. The strong association between multiple abortions and severe anaemia ($P < 0.001$) parallels findings from Hyder et al., who identified previous abortions as an independent determinant of anaemia among reproductive-age women.[8] Recurrent abortions likely contribute to cumulative blood loss and reduced iron stores, particularly when recovery intervals are short and dietary replenishment inadequate.

The type of contraceptive method showed significant variation in anaemia severity. Women using intrauterine devices (IUDs) were disproportionately affected by severe anaemia (66.7%), echoing regional data from Adhikary et al., which documented higher odds of anaemia among users of non-hormonal methods such as copper IUDs compared to hormonal or barrier methods.[20] The mechanism is primarily attributed to IUD-related endometrial bleeding, which may exacerbate iron loss over time. In contrast, oral contraceptive use has been associated with reduced menstrual blood loss and consequently lower anaemia prevalence, consistent with the relatively milder anaemia observed among oral pill users in this study.[20]

Comorbidity patterns were also notable, with diabetes mellitus (28.6%) and diabetes with hypothyroidism (28.6%) being the most common. This aligns with a meta-analysis from South Asia reporting a pooled anaemia prevalence of 45% among diabetic patients, largely due to inflammation-mediated suppression of erythropoiesis.[21] Additionally, the current study's participants exhibited evidence of chronic iron depletion, as reflected by low mean ferritin and transferrin saturation levels. Kolarš et al. similarly described anaemia and low iron indices among surgical and comorbid patients, suggesting multifactorial causation where chronic disease, inflammation, and repeated surgical interventions compound iron deficiency.[22] The finding that most participants had undergone two major surgeries (82.1%) underscores the surgical contribution to blood and iron loss.

Despite widespread PPI use (35.7% regular, 64.3% occasional), there was no significant association with anaemia severity. This contrasts with global evidence that long-term PPI therapy impairs iron absorption and predisposes to IDA.[23] The non-significant result in this context may stem from shorter durations of use or insufficient sample differentiation between chronic and intermittent users. Similarly, regular anthelmintic use, history of blood transfusion, and stool occult blood positivity did not significantly relate to anaemia severity, suggesting either effective deworming or low prevalence of parasitic burden in this urban sample, findings comparable to low helminth-attributable anaemia reported in recent urban Bangladeshi studies.[2]

Overall, the predominance of moderate anaemia (64.3%) highlights a chronic yet underrecognized public health issue in non-pregnant women. The study reinforces that while traditional factors such as menorrhagia and parity remain relevant, emerging contributors, including comorbidity, surgical history, and contraceptive use, are equally critical in shaping anaemia profiles in this population. The observed gaps between known risk factors and measured severity point toward complex biological and contextual interactions requiring longitudinal, mechanistic research. In the absence of nationally representative data for non-working women, these findings underscore the need for targeted anaemia prevention strategies that address not only reproductive losses but also chronic disease management, surgical optimization, and contraceptive counselling tailored to women's haematologic health.

Limitations of the Study

This study was limited by its single-centre, retrospective design and reliance on existing medical records, which may have introduced documentation or recall variability in reproductive and menstrual history. The sample size was relatively small and drawn from a hospital-based population, which may limit generalizability to community settings. Additionally, certain variables such as duration of contraceptive use, dietary intake, and inflammatory markers were unavailable, restricting further adjustment for potential confounders.

Conclusion

Iron deficiency anaemia among non-pregnant, non-working women of reproductive age was found to be highly prevalent and predominantly moderate in severity, reflecting a substantial chronic burden. The study identified significant associations with reproductive history, particularly repeated abortions, IUD use, and prior major surgeries, while other commonly implicated factors such as menorrhagia and PPI use did not show significant associations with severity. These findings underscore the multifactorial nature of IDA in this population, involving both reproductive exposures and chronic health factors rather than menstrual losses alone. The results highlight the need for targeted screening, comprehensive reproductive counselling, and integrated

management strategies addressing both haematinic deficiencies and broader women's health determinants.

Ethical Approval

The study was approved by the Institutional Ethics Committee.

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