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Knowledge Attitude and Practices of Iron-Folic Acid Supplementation and Deworming Among Mothers of 6 Months – 60 Months Children Attending an Urban Primary Health Care Centre Field Practice Area in Pudupet – A Cross Sectional Study

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Abstract:

- ***Background:***

Iron deficiency anemia (IDA) is a significant global health burden, especially in children under six. India combats childhood anemia via the National Iron Plus Initiative (IFA supplementation) and biannual deworming. NFHS 5 (2019-2021) reported anemia in 67.1% of Indian children under five, and 57.4% in Tamil Nadu.

- ***Methods:***

This two-month cross-sectional study (August-September 2022) surveyed 194 mothers of children aged 6-60 months at an urban primary health center in Pudupet. Data was collected using a semi-structured questionnaire.

- ***Results:***

Knowledge of IFA supplementation was 40.2% (78/194 mothers), while deworming knowledge was 69.6% (135/194). IFA supplementation was practiced by 52.6% (102/194) of mothers, and deworming by 67.5% (131/194). Although 65.6% (86/131) of deworming practices aligned with WHO guidelines (twice yearly), only 34.3% (35/102) of IFA supplementation was weekly and 35.3% (36/102) monthly, despite a twice-weekly recommendation. Key reasons for non-adherence included lack of awareness and perceived side effects like black stools for IFA (62.7%) and abdominal cramps for deworming (48.1%).

Binary logistic regression showed maternal age above 30 positively influenced IFA adherence, while lower-middle-class status and working mothers correlated with reduced IFA practice. For deworming, working mothers demonstrated significantly improved practices, and mothers with one child showed marginal significance. Both IFA and deworming practices were significantly associated with maternal occupation and socioeconomic status.

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➢ ***Conclusion:***

Deworming showed better knowledge, attitude, and practice than IFA supplementation. However, both interventions had less than 50% performance across knowledge, attitude, and practice indicators. With rising childhood anemia, increased awareness and practice of IFA supplementation and deworming are crucial for improving child well-being.

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I. INTRODUCTION

Iron deficiency anemia is an important childhood disease among all paediatric age groups. The World Health Organization (WHO) defines anemia in children under 5 years as a hemoglobin concentration below 110 g/L. WHO estimates that 40% of children 6–59 months of age, 37% of pregnant women, and 30% of women 15–49 years of age worldwide are anaemic.[1] The National Family Health Survey 5 (NFHS 5) for the year 2019- 2021 reported that the national disease burden among children aged under 5 years old was 67.1% and that of Tamil Nadu was 57.4%[2].

The magnitude of the problem in developing countries is high since they are more exposed to various health and socioeconomic problems, which are directly or indirectly related to anemia. Though all age groups can develop anemia due to various factors, under-five children are among the most vulnerable age groups. Lack of nutritional supplementation and lack of health care facilities are found to be important influential factors of anaemia among children. [3]

India uses a double pronged approach of supplementation with Iron – Folic acid (IFA) through the scheme National Iron Plus Initiative (NIPI) – launched by the Adolescent Division of the Ministry of Health and Family Welfare (MoHFW), Government of India and biannual deworming strategy through National Deworming Day (NDD) to combat childhood anaemia of nutritional deficiency. As compared to only deworming, IFA + deworming showed a 17.3% increase in blood haemoglobin levels Iron deficiency anaemia results in impaired cognitive and motor development in children and decreased work capacity in adults.

The effects are most severe in infancy and early childhood. [5] Biweekly, 1 ml Iron and Folic Acid syrup Each ml of Iron and Folic Acid syrup containing 20 mg elemental Iron + 100 mcg of Folic Acid is given for 6 months to 60 months cildren under Anaemia Mukth Bharath programme. Bottle (50ml) to have an 'auto-dispenser' and information leaflet as per MoHFW guidelines in the mono-carton [6]. Despite these efforts, the data obtained from NFHS 5 compared to NFHS 4 has worsened showing an increase in Disease burden of 8.5% nationally and 6.7% in Tamil Nadu. The target is to reduce the prevalence of disease to 40%Under the Anaemia Mukt Bharath (AMB) program[7].

Therefore the aim of this study is to estimate the prevalence of knowledge, attitude and practice about role of IFA Supplementation and deworming in the prevention of anemia among mothers of children under 5 years of age Attending a primary health care centre.

II. METHODOLOGY

The study design used was cross sectional study. The study was conducted for a period of two months between August 2022 and September 2022.

The study population was mothers of children between 6 months and 5 years of age visiting urban primary health center.

Based on the cumulative data available for the fourth quarter of the year 2021-2022 from the official Anemia Mukt Bharath website, the beneficiaries of IFA supplementation in the target age group in the district of Chennai under which the study center falls was found to be 20.0% and assuming the non-responsive rate to be 10%, the sample size was calculated to be 195 using formula S=4PQ/L^2, where S-sample size, P-percentage of beneficiaries, Q= (1-P), L- permissible limit of error.

The sampling method used was simple random sampling. The inclusion criteria were mothers of all children between 6 months to 60 months of age and exclusion criteria were mothers who didn't give consent for the study and mothers with speech, hearing difficulty.

Ethical clearance was obtained from the Institutional Ethics Committee. Informed written consent was obtained from the participants.

The data was collected using semi-structured, interviewer administered questionnaire based on previous studies. The question was made available in both English and Tamil language. The data obtained are entered in excel sheets data cleansing and missing data identification were done. Then descriptive and inferential analysis were done using SPSS v.28 software.

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III. RESULTS

A total of 194 mothers were included in the study. Among which 143 participants were between the age of 21 to 29 years. The parity of the participants was 1 in 106 participants,2 in 77 participants and 3 or more in 11 participants. According to the Modified Kuppuswamy scale 48 participants belonged to Class 1, 144 participants belonged to Class 2 and 2 participants belonged to class 3. No participants belonged to Class 4 & 5. (table 1)

Table 1: Sociodemographic Characteristics of the Participants

SOCIO DEMOGRAPHIC CHARACTERISTICS	TOTAL NUMBER & PERCENTAGE
AGE OF MOTHER	
18 -20	1 (0.5%)
21-29	143 (73.7%)
30 and above	50 (25.8%)
Total	194 (100%)
AGE OF CHILD	
6 months - 1 year	40 (20.6%)
1 year - 3 years	96 (49.4%)
3 years - 5 years	58 (30%)
MARITAL STATUS	
Married	190 (97.9%)
Others (divorced, widow)	4 (2.1%)
OBSTETRIC SCORE (no of live children)	
1 child	106 (54.6%)
2 children	77 (39.7%)
3 children or more	11 (5.7%)
MOTHER'S OCCUPATION	
Housewife	134 (69.1%)
Working	60 (30.9%)
SOCIOECONOMIC STATUS (SES)	
CLASS 1: Upper class	48 (24.7%)
CLASS 2: Upper middle class	144 (74.2%)
CLASS 3: Lower middle class	2 (1%)
CLASS 4: Upper lower class	0
CLASS 5: Lower class	0
(According to Modified KUPPUSWAMY SCALE)	

Table 2: Knowledge on Iron Supplementation and Deworming

Parameter	Questions	Yes	No	SCORE
Knowledge and awareness **regarding IFA supplementation**	1.Knowledge or awareness regarding IFA supplementation	78 (40.2%)	116 (59.8%)	
	2. Knowledge regarding frequency of supplementation	78 (40.2%)	116 (59.8%)	
	3. Knowledge that IFA deficiency causes anaemia and awareness regarding symptoms of anaemia such pallor, fatigue etc.	89 (45.9%)	105 (54.1%)	
	4.Awareness of any government schemes for IFA supplementation	18 (9.3%)	176 (90.7%)	
		64	130	

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	5.Awareness about who provides IFA supplementation and deworming	(33%)	(67%)	
Knowledge and awareness **regarding deworming**	1. Knowledge or awareness regarding deworming	135(69.6%)	59 (30.4%)	
	2. Knowledge regarding frequency of deworming	131(67.5%)	63(32.5%)	
	3. Knowledge that helminth infection from soil can cause anemia	50(25.8%)	144 (74.2%)	
	4. Awareness regarding any govt schemes for deworming	20 (10.3%)	174 (89.7%)	
	5. Awareness regarding who provides IFA supplementation and deworming	64 (33%)	130 (67%)	

Table 3: Attitude About Iron Supplementation and Deworming

ATTITUDE	YES	NO
1. Do you believe IFA supplementation is good.	177 (91.2%)	17 (8.9%)
2. Do you believe IFA Supplementation should be compulsory	167 (86.1%)	27(13.9%)
3. Do you believe deworming is beneficial	166 (85.6%)	28(14.4%)
4. Do you believe deworming should be compulsory	167 (86.1%)	26(13.4%)
5. Would you advice other mothers to practise IFA supplementation and deworming	168 (86.5%)	26(13.4%)
TOTAL ATTITUDE SCORE (IFA SUPPLEMENTATION AND DEWORMING)	0-3 = Poor attitude 3-5 = Good attitude	163(84%) = Good attitude 31 (16%) = Poor attitude

Out of the 194 participating mothers, 102 practice IFA supplementation while 92 participants do not practice IFA Supplementation and 131 participants practice deworming while 63 do not practice deworming.

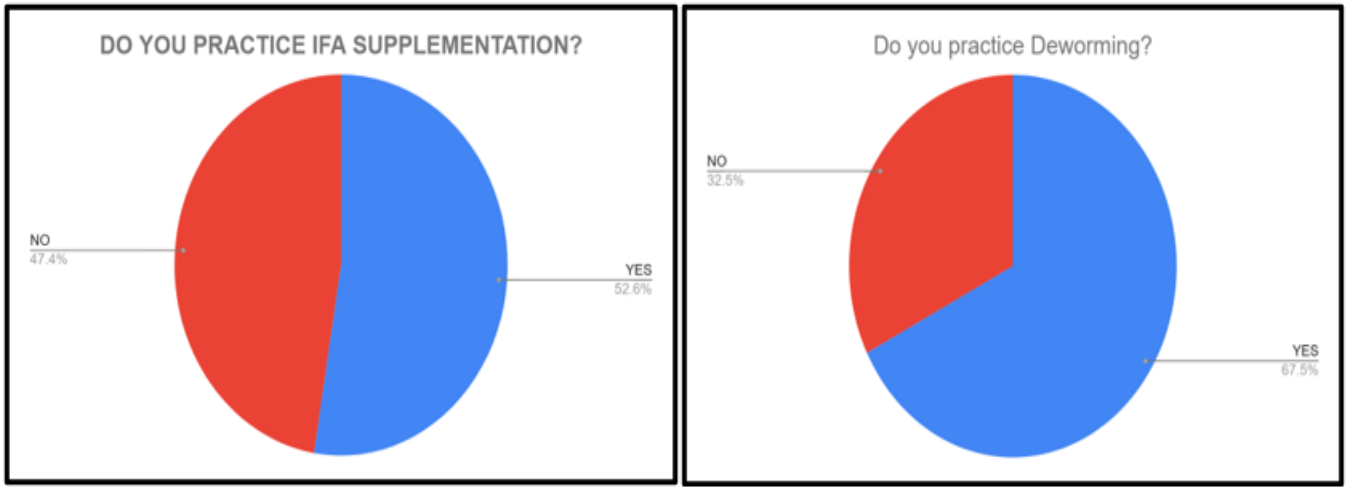

Chart 1: Practices of Ifa Supplementation and Deworming

Among the practicing participants of IFA supplementation (102 participants) , 35(34.3%) participants take it weekly once, 13(12.7%) take it weekly twice, 18 (17.6%) take it bi monthly and 36 (35.3%) take it as a monthly dose. Among the participants who practice deworming (131 participants), 45(34.4%) take it once a year and 86(65.6%) take it twice a year according to the WHO GUIDELINES and MINISTRY OF HEALTH AND FAMILY WELFARE (MoHFW).

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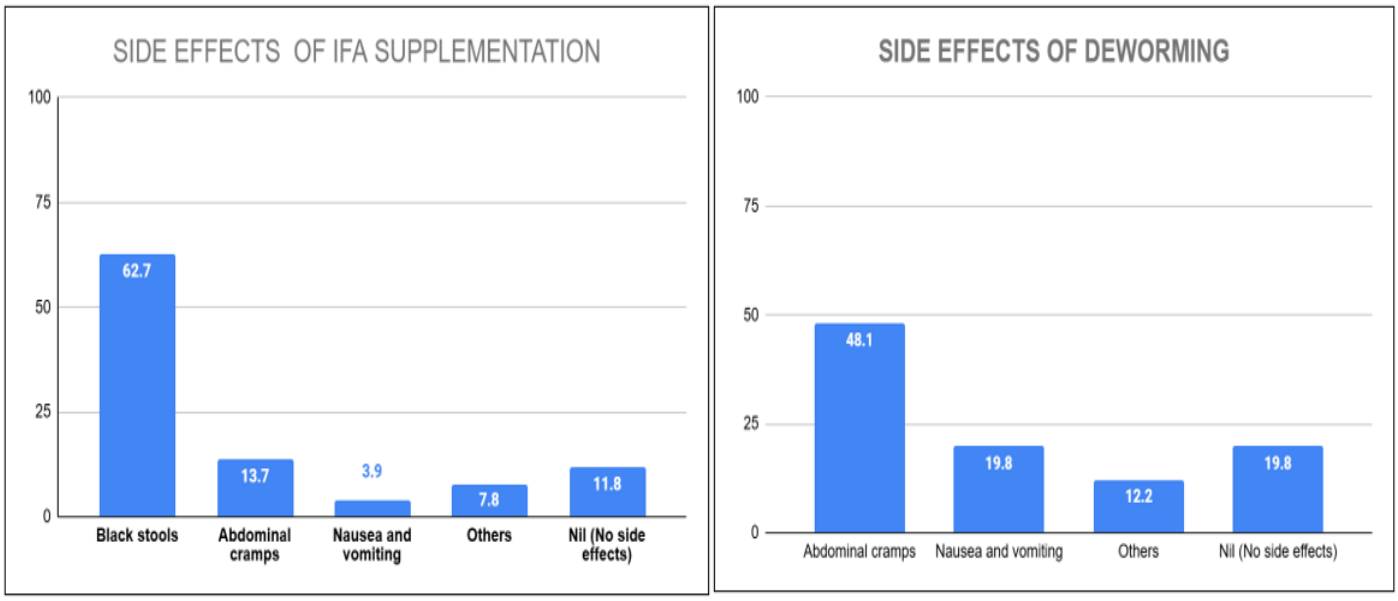

Chart 2: Participants View of Side Effects of Ifa Supplementation and Deworming

Table 4: Significance of Practise of IFA Supplementation across Different Sociodemographic Characteristics *p value <0.05 Considered Statistically Significant

SOCIODEMOGRAPHIC CHARACTERISTICS	YES n(%)	NO n(%)	Chi-square value	P value
Age Group 18-20 21-29 Above 30	 1 82 19	 0 61 31	6.466	0.039*
Marital Status Married Other marital status	 100 2	 90 2	.917	1.000
Obstetric Score/ no of live children 1 child 2 children 3 children	 59 41 2	 47 36 9	5.637	0.060
Mother's occupation Housewife Working women	 63 39	 71 21	5.376	0.020*
Socioeconomic status Upper class Upper middle class Lower middle class	 36 64 2	 12 80 0	15.303	0.000*

Table 5: Significance of Practise of Deworming across Different Sociodemographic Characteristics *p value <0.05 Considered Statistically Significant

SOCIODEMOGRAPHIC CHARACTERISTICS	YES	NO	Chi-square value	P value
Age Group 18-20 21-29 Above 30	 1 94 36	 0 49 14	1.147	0.564
Marital Status Married Other marital status	 127 4	 63 0	1.964	0.306
Obstetric Score/ no of live children				

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1 child 2 children 3 children	65 60 6	41 17 5	6.502	0.039*
Mother's occupation Housewife Working women	83 48	51 12	6.164	0.013*
Socioeconomic status Upper class Upper middle class Lower middle class	38 93 0	10 51 2	7.694	0.021*

Table 6: Logistic Regression Model for Characteristics Affecting IFA Supplementation. *p value <0.05 Considered Statistically Significant

Characteristics	Category	B	P-value	Unadjusted Odd's Ratio	Adjusted Odd's Ratio	95% C.I Lower	95% C.I Upper
Age	18-20		.136				
	21-29	21.486	1.000	0	$2.1 * 10^9$	.000	.
	Above 30	.739	.046*	0	2.095	1.015	4.324
Marital status	Married						
	Other marital status	-.105	.925	0.9	.900	.100	8.124
Obstetric score	1 child		.277				
	2 children	.178	.583	0.9	1.195	.632	2.260
	3 children	-1.173	.168	0.177	.310	.058	1.641
Mother's occupation	Housewife						
	Working women	-.689	.048*	2.093	.502	.253	.995
Socioeconomic class	Upper class		.010*	-			
	Upper middle class	-1.178	.002*	2.09	.308	.144	.660
	Lower middle class	20.283	.999	0.27	$6.4 * 10^8$	.000	.

Table 7: Logistic Regression Model for Characteristics Affecting Deworming *p value <0.05 Considered Statistically Significant **Undefined Odd's Ratio Arise because there were zero "no" Responses in the Reference Group for those Specific Comparisons

Category		B	P-value	Unadjusted Odd's Ratio	Adjusted Odd's Ratio	95% C.I Lower	95% C.I Upper
Age	18-20		.630	-			
	21-29	-19.983	1.000	Undefined**	.000	.000*	.
	Above 30	.390	.336	Undefined**	1.477	.667	3.275
Marital status	Married		-	-	$5.6 * 10^7$	.000*	.
	Other marital status	20.141	.999	Undefined**			
Obstretic score	1 child		.033*	-	.737	.192	2.833
	2 children	-.305	.657	2.226	.308	.078	1.219
	3 children	-1.176	.093	0.757	2.501	1.154	5.419
Mother's	Housewife		-	-			

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Occupation	Working women	.917	.020*	2.458	.000	.000	.
socioeconomic class	Upper class		.155	-	.000	.000	.
	Upper middle class	-22.721	.999	0.480	2.335		
	Lower middle class	-21.904	.999	2.09			

IV. DISCUSSION

In this study, 102 individuals (52.6%) reported practicing IFA supplementation and 131 individuals (67.5%) reported practicing deworming whereas in the study conducted by Reena Mohan et al. iron and folic acid supplementation was taken by 31.2% of the children before the interview. [9] In the study conducted by Dhanuraja V et al. in Kancheepuram among 208 under 5 children showed that (65.4%) mothers have done deworming to their children regularly, this result is closely related to the results in this study. [11] This study showed that 79.9% of the participants had poor knowledge about iron supplementation and a mere percentage of 20.1% had good knowledge. The knowledge on deworming was better when compared to iron supplementation as 31.4% had good knowledge yet the overall knowledge gap is high. In the study conducted by Bahago NI et al. in Nigeria, while the percentage of mothers practicing deworming for children under 5(66.4%), the knowledge was very high of about 96.2%. [12]. Inspite of higher practices but lower knowledge may be attributed to the lack of Health education among the mothers.

Practices of IFA supplementation among the surveyed individuals reveal that a significant portion take it monthly once (35.3%, n=36) or weekly once (34.3%, n=35), while fewer individuals supplement every two weeks (17.6%, n=18) or twice a week (12.7%, n=13). According to the Anemia Mukt Bharath program, children of the studied age group should take IFA supplementation weekly twice. When questioned on why there was this discrepancy maximum participants blamed the lack of awareness and knowledge and equally second the side effects of IFA supplementation with black colouration of stool being the most commonly reported (62.7%). Among the non-practitioners of IFA supplementations, lack of awareness, side effects and the ideology of supplements being unnecessary for their children.

Practices of deworming among the surveyed individuals, the majority (65.6%, n=86) do so twice a year, while a smaller proportion (34.4%, n=45) deworm once annually. This practice aligns with the WHO standards and MINISTRY OF HEALTH AND FAMILY WELFARE (MoHFW). Yet the practitioners still seem to be low with most participants blaming the lack of awareness, decreased necessity of biannual deworming and side effects mainly abdominal cramping (48.1%).

When the IFA supplement was analysed along with other selected variables, a significant association was found among the age of the mothers (p=0.039) with the maximum number of participating mothers being in the age group of 21 to 29 years (73.7%). Whereas when the Deworming was analysed along with other selected variables, a significant association was found with the parity of the mother (p=0.039) with maximum of the participants having only one child (54.6%). In both IFA supplementation and deworming a significant association was found between occupation of the mother (p=0.020; p=0.013) majority as housewives and socioeconomic status of the family (0.00;0.021), with most of the participants belonging to the Class 2 (upper middle class - 74.2%). In the study conducted by Sant-Rayn Pasricha et al. among children aged 12 months to 23 months in rural Karnataka conducted in 2008 revealed significant association in wealth and mothers' educational status to IFA supplementation. With more than a decade of time the socioeconomic status continues to hinder IFA supplementation among the population. [10].

- *Binary Logistic Regression Model was done for Factors Influencing IFA Supplementation*

Table 6 shows factors significantly related to IFA supplementation adherence of mothers of children between 6 and 60 months old. The results show that maternal age is a significant factor where mothers above 30 years of age had a positive relation with IFA supplementation adherence. On the other hand, mothers from the lower middle class had reduced odds of IFA supplementation. The research also identified a strong correlation between occupation of the mother and IFA supplementation, with working women having a lower tendency of practicing IFA supplementation. These results indicate that socioeconomic determinants still shape IFA supplementation practice, an issue further brought out in a study by Sant-Rayn Pasricha et al. in rural Karnataka in 2008, where they identified a strong correlation between wealth, education of mothers, and IFA supplementation.[10]

In addition, Priya et al.'s study on weekly iron and folic acid (WIFS) supplementation among rural Puducherry school children provides further evidence of determinants of IFA uptake[13]. Although their research discovered that gender, family type, parents' education, and occupation were not related to the use of IFA tablets among adolescents, it did reveal some usual causes of refusal or occasional use, including stomach pain (41.7%), nausea and vomiting (24.5%), and disliking the tablets (22.3%). Girls specifically noticed side effects such as stomach pain, nausea, dizziness, foul taste, and weight gain worries, and boys typically thought tablets were not needed and experienced side effects such as pain in the stomach and nausea, sometimes going to the extent of throwing away the tablets. Inability to get tablets occasionally, lack of proper awareness about how important they are, and informal program implementation were also reported as major obstacles. These qualitative results from

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Priya et al. are useful background information on perceptions and hands-on issues that may similarly influence IFA supplementation practice among mothers, particularly side effects and awareness, that may explain differences noted in practice despite government intervention.

- *Binary Logistic Regression Model was done for Factors Influencing Deworming*

Table 7 displays the logistic regression model for factors influencing mothers' deworming practices. From the analysis, it is clear that working mothers have significantly improved deworming practices. Also, mothers with an obstetric score of 1 (having a single child) revealed marginal significance in deworming practices. Undefined odds ratios were recorded in certain categories because of zero "no" responses in the reference group for particular comparisons. These high determinants can be used for focused health promotion and education interventions to enhance deworming practice. The high prevalence of deworming practice (67.5%) in this study is consistent with the findings of a study done by Dhanuraja V et al. in Kancheepuram, where 65.4% of the mothers stated regular deworming in their children[11]. Even though practice rates are good, there is still a significant knowledge deficit when it comes to deworming, indicating practice may be more influenced by procedure or program dictates than full awareness.

V. CONCLUSIONS

The knowledge, attitude and practice was better among deworming when compared to IFA supplementations. Yet both IFA supplementations and deworming KAP has its performance less than 50% of the participants. With the increasing trend in anaemic children between the age of 6 months to 5 years according to the National Family Health Survey, Awareness and practicing of IFA supplementation and deworming should be exponentially increased to improve the well-being of the future backbones of a country.

LIMITATIONS

The impact of Health education and different modalities of changing Knowledge, Attitude and Practice among the Participants regarding supplementation and deworming was not explored, thereby unable to provide solutions to this discrepancy. Adopting more study settings covering both rural and urban populations would have given a more holistic report and improve the external validity.

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DECLARATIONS

Conflict of Interests:

The authors declare no conflict of interests.

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