Original Research Article

Alarming rise in abdominal obesity among Anganwadi workers in a rural area of Ludhiana

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ABSTRACT

Background: Anganwadi Workers (AWWs) at Anganwadi Centers (AWCs) under Integrated Child development Scheme (ICDS) are currently, overburdened. The health of AWWs should be optimum for carrying out duties under ICDS program efficiently.
Methods: A cross-sectional study was conducted among AWWs in rural Ludhiana. A pre-tested questionnaire was used, their physical health status was assessed and pattern of social media usage was determined.
Results: Out of the total 106 AWWs, majority (74.5%) were in the age group of 40-60 years (mean age=51.44±8.83), 72.6% were living with spouse and 61.3% were educated above 10th standard. Regarding self-reported morbidity, 33% had hypertension and 16% had diabetes mellitus. The mean systolic blood pressure (BP) and diastolic BP were 128.58±20.7 and 77.16±10.57 mm of Hg respectively. The mean random blood sugar (RBS) was 131.78±76.17mg/dL and mean body mass index (BMI) was 27.90±4.70, with 79 (74.5%) having BMI≥25. The mean waist hip ratio (WHR) was 0.926±0.07, showing increase with age. All the subjects were using social media platforms with daily average screen time of 3.82±2.2 hours. The association between BMI versus age group (p<0.03), education level (p<0.028) and hypertension (p<0.012) were statistically significant. The association between WHR versus education level (p<0.03) was significant. The majority (77.4%) agreed social media provides misinformation. About 11.3% reported positive and 32.1% reported a negative health change after social media usage.
Conclusions: The government should mandate the annual health checkup of AWWs. Social media can be utilized positively by them for prevention and control of risk factors like obesity.

Keywords: Anganwadi worker, Health status, ICDS, Poshan app, Social media usage

INTRODUCTION

AWWs under the ICDS have proven themselves to be an asset to health care development in rural and urban areas of India. Their main objective is to address the critical issues of maternal and child health as well as many other welfare activities in rural areas. Each Anganwadi is run by an AWW and helper in coordination with the existing health care delivery system in rural areas.[1] The AWCs are part of ICDS program to combat child hunger, malnutrition and other health issues of children under five.[2]

ICDS, targets infants and children below six years of age, women in the reproductive age group of 15 to 49 years and expectant and nursing mothers. Any investment in

children's health is an anticipatory investment in the health of the nation.[3] AWW is the main force of the scheme and plays a crucial role in providing services to beneficiaries as she belongs to the same community. She works to promote child development which includes supplementary nutrition, immunization, health check-ups, health education, referral services and non-formal education.[3] These AWWs are overburdened and unable to manage their daily work effectively.[4]

The health of AWWs should be optimum for carrying out duties under ICDS program efficiently.[5] With the increasing dependence on technology for data management, a Poshan Tracker has been introduced in the ICDS scheme to obtain real time data from AWCs to improve the efficiency of AWWs since year 2023 using smartphones.[6] However, the introduction of smartphones has also increased health problems associated with indulgence in social media usage. Periodical medical examination of AWW is a necessity to run the activities under ICDS program effectively. Taking into consideration various factors, this study was done to assess the social media usage and health status of the AWWs working in the rural area of Ludhiana.

METHODS

Type of study

A cross-sectional study among 106 Anganwadi workers working under ICDS scheme in rural area of the Ludhiana district.

Type of sampling

This was a convenience sampling.

Sample size

106 AWWs. All the AWWs had gathered at RHTC under the Department of Community Medicine for a sensitization program to detect ocular anomalies in children attending AWCs in rural areas. This opportunity was utilized for opportunistic screening and routine health check-ups. The inclusion criteria were any Anganwadi worker giving consent to be part of study.

Study duration

The study was done in month of June 2025.

IEC Approval

The approval for the study was given by Institutional Ethics Committee letter no. IEC/2025/485.

Data collection

The social media usage by AWWs was explored by investigators by using a pretested questionnaire.

Participant's prior consent was obtained. The participants were questioned using a pre-tested pro forma. The questionnaire was administered in Punjabi and English to ensure clear comprehension. It primarily encompassed demographic and health status information, as well as the pattern of social media usage. The data was collected by interviewing the AWWs and pretested pro forma was filled. Weight was recorded to nearest 100 grams on standardized electronic weighing machine.[7] Height was measured to the nearest cm against a wall with heels, buttocks, shoulders touching the wall and shoulders relaxed, using a semi-rigid tape. Body mass index (BMI) was calculated and classified as per Asian classification.[8]

Blood pressure was measured with a prior standardized digital sphygmomanometer.[9] Waist circumference was measured between the center point of lower border of ribs and upper border of iliac crest; the WHR cutoff taken was 0.8.[10] Hip circumference was measured between the maximum gluteal prominence on back and ischial tuberosity in front. Spot RBS testing was done using Abott FreeStyle Optimum H glucometer with levels above 200 mg/dl considered significant.[11,12]

Statistical analysis

Data was entered into a MS Excel and analyzed using SPSS version 25.0 (IBM SPSS, Chicago, Illinois, USA). Descriptive statistics (mean±SD) for continuous variables, frequencies and proportions (percentage) for categorical variables were computed. The association between different variables was assessed through Chisquare (χ2) test and p value less than 0.05 was considered statistically significant.

RESULTS

Out of the total 106 AWWs, majority (74.5%) were in age group of 40-60 years (mean age=51.44±8.83), 72.6% were living with spouse and 61.3% were educated above 10th standard (Table 1). Regarding self-reported morbidity, 33% had hypertension and 16% had diabetes mellitus, while migraine, arthritis and depression reported were below 5% individually.

The mean SBP and DBP were 128.58±20.7 and 77.16±10.57 mm of Hg respectively. The mean RBS was 131.78±76.17 mg/dl and 11 (10.4%) were found to have levels above 200 mg/dl on spot testing. Out of total subjects, 74.5% were obese and obesity increased with increasing age. The mean BMI was 27.90±4.70. The majority of the subjects (93.4%), had a WHR greater than 0.8. The mean WHR was 0.926±0.07 and it increased with increase in the age of the study subjects.

As shown in Figure 1, Poshan tracker app was used by all the AWWs on working days for average duration of 2 hours and all the subjects were using social media platforms.
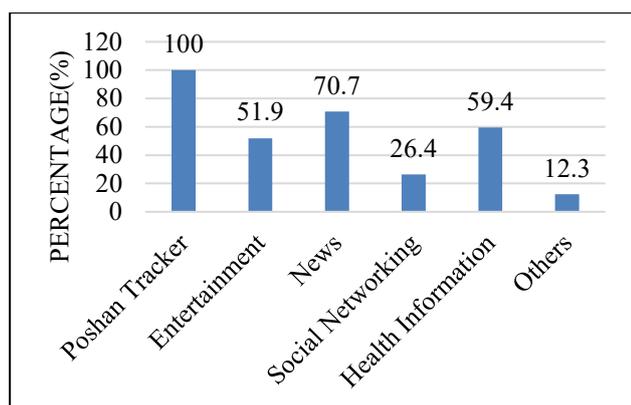
Figure 1: Primary purposes of social media use by AWWs.

They were also using social media apps for news (70.7%), health information (59.4%), entertainment (51.9%) and social networking (26.4%). Regarding social media platforms, YouTube (86.8%), WhatsApp (82.1%), Facebook (41.5%) and Instagram (19.8%) were prominently used by them with daily average screen time of 3.82±2.2 hours (Table 1 and 2). The association between BMI versus age group (p<0.03), education level (p<0.028) and hypertension (p<0.012) were statistically significant. The association between WHR versus education level (p<0.03) was statistically significant but was nearly significant with hypertension (p=0.055) (Table 3). As shown in Table 4, majority of the AWWs were using social media for searching topics related to nutrition (84%) such as healthy eating and two-thirds were searching for exercise and yoga for obesity management.

Regarding perceived effects of social media by AWWs (Table 5), majority (77.4%) agreed that it provides wrong information. Nearly half of them reported that they were facing emotional stress and experiencing disturbed sleep patterns due to its usage. Approximately two thirds of them indicated that they were feeling physical discomfort (64.2%) and were making health decisions based on social media information. Only, 7.5% were monitoring their total step count daily on smartphones and 1.9% were tracking their menstrual cycle on it. Positive health changes were reported by 12 (11.3%) of AWWs such as exercise and avoidance of junk food, while 36 (32.1%) reported negative health changes, such as headaches, eye strain and back pain after social media usage. (Table 6). The relationship between daily average screen time with BMI and WHR was found to be non-significant.

Table 1: Socio-demographic, self-reported diseases and social media platform usage details of AWWs.

Variable	Category	Frequency	%
Age (in years)	<40	9	8.5
	40-60	79	74.5
	≥60	1	17
Marital status	With spouse	77	72.60
	Without spouse	29	27.4
Education level (years of schooling)	<10	41	38.7
	≥10	65	61.3
History of any chronic disease (self-reported)	Diabetes mellitus type 2	17	16
	Hypertension	35	33
	Migraine	5	4.7
	Arthritis	4	3.8
	Thyroid disorder	4	3.8
	Cardiac problem	3	2.8
	Depression	3	2.8
	Allergic rhinitis/ asthma	3	2.8
	Neurological problem or seizure	2	1.9
	Others (hernia/ hyperuricemia / breast cyst / lumbar spondylosis)	4	3.8
Social media platforms used*	YouTube	92	86.8
	WhatsApp	87	82.1
	Facebook	44	41.5
	Instagram	21	19.8

*Total is more than 106 because each AWW used more than 1 social media platform.

Table 2: Mean, Median and range of Age, BMI, BP, WHR and RBS.

Variable	Mean±SD	Median	Range (Min-Max)
Age (in years)	51.44±8.83	52.00	28-69
BMI (kg/m²)	27.90±4.70	27.86	14.69-41.94

Continued.

Variable	Mean±SD	Median	Range (Min-Max)
SBP (mmHg)	128.58±20.7	129.00	85-180
DBP (mmHg)	77.16±10.57	79.5	51-102
Waist-hip ratio	0.926±0.070	0.940	0.72-1.13
RBS (mg/dl)	131.78±76.17	105.00	73-425
Daily screen time in last week in hours	3.82±2.20	4.00	0.50-10

Table 3: Association of BMI and WHR with sociodemographic variables.

	BMI			WHR	
	<23	23–24.9	≥25	<0.8	≥0.8
Age group (years)					
<40	0 (0.0%)	2 (22.2%)	7 (77.8%)	2 (22.2%)	7 (77.8%)
40-60	12 (15.2%)	6 (7.6%)	61 (77.2%)	5 (6.3%)	74 (93.7%)
≥60	1 (5.6%)	6 (33.3%)	11 (61.1%)	0 (0.0%)	18 (100%)
Total	13 (12.3%)	14 (13.2%)	79 (74.5%)	7 (6.6%)	99 (93.4%)
P value	Fisher Exact=9.21, p<0.03			Fisher Exact=3.9 p=0.107	
Marital Status					
Without spouse	3 (10.3%)	3 (10.3%)	23 (79.3%)	1 (3.4%)	28 (96.6%)
With spouse	10 (13.0%)	11 (14.3%)	56 (72.7%)	6 (7.8%)	71 (92.2%)
Total	13 (12.3%)	14 (13.2%)	79 (74.5%)	7 (6.6%)	99 (93.4%)
P value	Fisher Exact=0.38, p=0.82			Fisher Exact=0.64 p=0.42	
Education level					
<10	4 (9.8%)	10 (24.4%)	27 (65.9%)	0 (0.0%)	41 (100%)
≥10	9 (13.8%)	4 (6.2%)	52 (80.0%)	7 (10.8%)	58 (89.2%)
Total	13 (12.3%)	14 (13.2%)	79 (74.5%)	7 (6.6%)	99 (93.4%)
P value	Fisher Exact=6.98, p<0.028			Fisher Exact=4.72, p<0.03	
Diabetes mellitus					
Yes	1 (5.9%)	2 (11.8%)	14 (82.4%)	0 (0.0%)	17 (100.0%)
No	12 (13.5%)	12 (13.5%)	65 (73.0%)	7 (7.9%)	82 (92.1%)
Total	13 (12.3%)	14 (13.2%)	79 (74.5%)	7 (6.6%)	99 (93.4%)
P value	Fisher Exact=0.59, p=0.9			Fisher Exact=1.43 p=0.23	
Hypertension					
Yes	0 (0.0%)	6 (17.1%)	29 (82.9%)	0 (0.0%)	35 (100.0%)
No	13 (18.3%)	8 (11.3%)	50 (70.4%)	7 (9.9%)	64 (90.1%)
Total	13 (12.3%)	14 (13.2%)	79 (74.5%)	7 (6.6%)	99 (93.4%)
P value	Fisher Exact=8.78, p<0.012			Fisher Exact=3.69 p=0.055	

Table 4: Various topics of health information accessed by AWWs.

Category	Frequency	%
Nutrition (balanced diet, healthy food choices, cooking, food recipe and junk food information)	89	84
Exercise and yoga	69	65
Diseases and related health education	42	39.6
Pregnancy and child birth (reproductive health)	23	21.7
Counselling of mothers and adolescent girls	5	4.7
Others (contraception, weight loss and side effects of medicines)	4	3.8

*Total is more than 106 because of multiple responses by each AWW.

Table 5: Perceived effects of social media use among participants (n=106).

Question	Response	Frequency	%
Do you think social media provides wrong information?	Yes	82	77.4
	No	24	22.6
Faced emotional stress after consuming social media?	Yes	59	55.7

Continued.

Question	Response	Frequency	%
	No	47	44.3
Is social media affecting your sleep pattern?	Yes	52	49.1
	No	54	50.9
Experienced physical discomfort after prolonged social media use?	Yes	68	64.2
	No	38	35.8
Noticed changes in health since starting regular social media use?	Yes	47	44.3
	No	59	55.7
Health decisions, based on social media information	Yes	68	64.2
	No	38	35.8
Use of mobile phone for health tracking (n=106)			
Daily walking step count	Yes	8	7.5
	No	98	92.5
Tracking menstrual cycle	Yes	2	1.9
	No	104	98.1

Table 6: Health change reported by AWWs.

Category		Frequency	%
Positive change	Started exercises	6	12.5
	Avoided junk, oily, sugary foods	2	4.1
	Peace of mind	4	8.3
Negative change	Headache	11	22.9
	Stress and sleep problem	10	20.8
	Eye strain	9	18.7
	Body ache and backpain	4	8.3
	Weight gain	2	4.1
Total		48	100

DISCUSSION

In the present study, the mean age of all 106 AWWs included in the study was 51.4±8.8 years. The majority (74.5%) were in the age group of 40-60 years and 72.6% of them were married. Naidu et al in their cross-sectional study on the health profile of Anganwadi sevikas working in rural Thane, Maharashtra found that mean age was 45.98±9.51 years, 70.69% workers belonged to 40-58 years age group and all were married with 56.9% having educated below graduation.[3] Jayalekshmi et al in their study on the health problems of AWWs in an urban area of Thane, Maharashtra found that 90.32% subjects belonged to the age group of 40-58 years with mean age of 47.79±5.95 years and 77.42% were less than graduates.[13]

Modi et al in their study on health, profile and practices of Anganwadi workers in Surat city, Gujarat found that, AWWs had a mean age of 38.11±5.95 years.[14] In present study, 35 (37%) AWWs gave history of hypertension and the mean SBP and DBP were 128.58±20.7 and 77.16±10.57 mmHg respectively. Similar findings were reported by Naidu et al from rural Thane, Maharashtra in AWWs with mean systolic BP of 124.55±8.49 and mean diastolic blood pressure 78.41±5.46 mmHg. However, 5.17% were found to be hypertensive compared to 37% in the present study.[3] Modi et al found that, 22.9% of

them were hypertensive.[14] Other studies, such as Mohanan et al from Mangalore, Karnataka reported prevalence rate of hypertension to be 9% among AWWs and Ahmed et al also found 9.2% prevalence rate for same among healthcare workers in Nelamangala, Karnataka.[15,16]

In current study, 74.5% subjects were obese (BMI>25) and 93.4% had abdominal obesity (WHR≥0.8). The mean BMI and WHR were 27.90±4.70 and 0.926±0.07 respectively. There was significant association between obesity and occurrence of hypertension. In a study conducted by Ahmed et al among healthcare workers in Nelamangala, Karnataka, 33.3% were overweight, 8.3% obese and 62.5% had abdominal obesity.[16] In contrast, study conducted by Mohanan et al in Mangalore, Karnataka found that only 2% were overweight/obese.[15] Using smartphone for Poshan Tracker also allows AWWs to access other social media applications easily and smoothly. In present study, all the AWWs used smartphones for Poshan Tracker application.

Similarly, Panmei et al and Meshack et al found in Naga women of Northeast India, that 90.3% of women used smartphones for job-related purposes.[17] In this study, all the subjects were using various social media platforms e.g., YouTube (86.8%), WhatsApp (82.1%), Facebook (41.5%) and Instagram (19.8%). The study conducted by

Shekhawat et al in Vadodara (Gujarat) to find out the impact of social media on women found that, 27.8% were using both WhatsApp and Instagram, 22.4% were using YouTube and 8.7% were using Facebook.[18] Panmei et al and Meshack et al in their study on an assessment of social media usage patterns and influences among tribal Naga women, found that 93.9% were using WhatsApp, 82.2% Facebook, 82.8% YouTube and 68.1% were using Instagram.[17] Social media usage provides easy access to knowledge related to various aspects of daily life, but the authenticity of information remains doubtful. In present study, 77.4 % of AWWs perceived that social media provides wrong information. Similarly, study by Shekhawat et al and Bhatt et al in Vadodara found that 50% women believed that social media information is unnecessary and confusing information.[18]

Regarding usage of social media by AWWs, 70.7% of them used social media for news related purposes. Similarly, Panmei et al and Meshack et al found that 95.93% of women used smartphones for news related purposes.[17] The average screen time of Indian adults is 6 hours and 49 minutes per day.[19] In current study, daily screen time was 3.82±2.2 hours with usage of smartphones multiple times a day. Panmei et al and Meshack et al found that 74.5% of women used smartphones for several times a day and only 3.29% were using them occasionally.[17]

Strengths

The study has its own specific strengths. The usage of smartphones by AWWs was analyzed and the physical health status was measured simultaneously. The AWWs with undetected and no history of chronic diseases were counseled for health checkups. The study provides a sneak peek into the lives of AWWs. It highlights the diminishing physical and mental health of AWWs due to various reasons in addition to screen time. The study provides guidance to ICDS policymakers to address these issues as a priority to keep this workforce which numbers in the lakhs, sound and healthy.

Limitations

The sample size is small and study is from a specific location; hence, the findings cannot be generalized. The simultaneous use of smartphone by family members post-job hours might have increased the screen time of the concerned AWWs. Due to the white coat effect, the SBP readings might be higher than usual. The RBS readings should be confirmed by venous blood sampling.

CONCLUSION

This study provides an insight into the current physical health status of AWWs. The alarming prevalence of overweight, obesity and abdominal obesity cannot be ignored though these findings are based on a very small sample size. The Poshan tracker application on smartphones, consumes a significant proportion (>25%) of their time while they are on job. This also increases their dependency on smartphones to explore other applications as well. In this process, they are exposed to different information regarding health and nutrition, as they use social media for their health queries. There is a potential of this finding for prevention and control of diseases in them through regular dissemination of messages related to health promotion and disease prevention. The government should mandate annual health checkups for AWWs. They should be educated during program officer meetings about limiting screen time and taking care of their health. With this will they be able to carry out their responsibilities with all strength and vigor. It is recommended to conduct further research studies to substantiate the declining physical and mental health status of AWWs.

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