Global Academic Journal of Medical Sciences, 2020; 2(4) 20-24

DOI: 10.36346.GAJMS.v02i04.001

Avilable online at https://gajrc.com/gajms

OPEN ACCESS

ISSN: 2706-9028 (O)
ISSN:2707-2533 (P)

Pattern of Drinking Water Consumption among Residents of Rural Area in District Shimla

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Article History
Received: 25.06.2020
Accepted: 12.07.2020
Published: 22.07.2020

Abstract: ***Background:*** Water is basic human right which is required for the survival, sustainability and development of human's life. A normal healthy person needs to drink about 8 glasses (2litres) of water per day but the importance of drinking adequate amount of water is often overlooked. The aim of the present study was to estimate the amount and pattern of drinking water consumed and various methods of water purification used by the residents of rural health training center (RHTC) area of Indira Gandhi medical college, Shimla. ***Material & Methods:*** It was a community based cross sectional survey conducted in RHTC area from August 2019 through September 2019 and included Population of all age groups residing in this area. Simple random Sampling was done for the selection of 400 Households. Statistical analysis was done by using Epi Info 7 software using appropriate tests. ***Results:*** Most of the participants belong to 20-59 years (64%) and were males (53.5%).Among the study participants, main source (75.5%) of drinking water supply was IPH (Irrigation & Public Health) which was household piped water supply and 49.5% participants used any method of water purification. Mean drinking water Consumption per day was 1.33±0.76 Liters / day and was significantly higher in males and in adults. ***Conclusion:*** Health promotion campaigns should be organized by the health care workers in this area to encourage the creation of an environment favoring drinking water consumption.

Keywords: Drinking water consumption, water purification methods, Rural Health Training Center.

Research Article

INTRODUCTION

Water is the major constituent of the human body as it accounts for 70% of our body weight. It is a constituent of blood and other vital body fluids. Every cell, tissue and organ in your body needs water to function properly (www.mayoclinic.org; & www.healthline.com). It is an essential nutrient, which is required for the survival, sustainability and development of human's life. It modulates normal osmotic pressure, regulates body temperature, maintains electrolyte balance, flushes toxins from organs, carries nutrients to cells and helps in digestion of food (www.betterhealth.vic.gov.au).

Water plays a key role in elimination of body wastes. It helps in regulation of body temperature, lubricates and cushions joints the joints and bones, protects the spinal cord and other sensitive tissues. The body loses water through sweat, urine and faeces. This loss must be constantly replenished with clean and potable water. As per various Health authorities, a normal healthy person needs to drink about 8 glasses (2 litre) of water per day (www.mayoclinic.org; &

www.healthline.com; www.betterhealth.vic.gov.au; & Ohno, K. *et al.*, 2018).

Various Studies suggest that long-term benefits of drinking adequate amount of water might include a lower risk of colorectal cancer and cancers of the urinary system, heart disease, urinary tract infections, kidney stones, constipation, high blood pressure, stroke and many other diseases..There have also been claims that water can "detox" the body. Low fluid intake may impair cognitive performance, reduce the ability to perform physical activities and increase the incidence and prevalence of kidney and urinary system diseases (www.medicalnewstoday.com; www.webmd.com; & www.onemedical.com).

However, the importance of drinking adequate amount of water is often overlooked and there are not enough studies relating to drinking water consumption. Therefore, the aim of the present study was to estimate the amount and pattern of drinking water consumed and various methods of water purification used by the residents of rural health training center area of Indira Gandhi medical college, Shimla.

Objectives of the study

- To assess the amount and pattern of drinking water consumed by the residents of rural health training center area of Indira Gandhi medical college, Shimla.
- To assess the source of drinking water and various methods of water purification used by the residents of rural health training center area of Indira Gandhi medical college, Shimla.

MATERIAL & METHODS

Study Design

It was a community based Cross sectional survey.

Study Area

The study was conducted in Rural Health Training Center Area, Mashobra of District Shimla Himachal Pradesh located in the south-western ranges of the Himalayas and attached with Department of Community Medicine, Indira Gandhi Medical College, Shimla.

Study Period

2 months (August 2019 through September 2019).

Study Population

Population (All age groups) residing in Rural Health Training Center Area, Mashobra of District Shimla.

Sample Size

Sampling unit was households in the Rural Health Training Center Area, Mashobra . Sample size was estimated to be 374 expecting 50% of household in selected area are consuming adequately amount of water with 95% level of confidence and 5% confidence interval. Taking non response rate of 5%, we take a total sample size of 394 households.

Sampling Design

Simple random Sampling was done for the selection of 400 Households for survey area taking the whole households list of that area. Only one member in the household was selected by random sampling after enumerating all the members in the households above 1 year of age.

DATA COLLECTION

Before doing the data collection, the survey team consisting of MBBS students and residents of department of community medicine was given training regarding the data collection. The data collectors obtained consent from the head of Family and Pretested Standardized Questionnaire was administered in every selected household and the respondents was asked questions regarding drinking water source, consumption, purification etc. For participants less than 10 years of age, data was collected from their parents.

Data Analysis: The collected Data was thoroughly screened and entered in Microsoft Excel spreadsheet 2007. Statistical analysis was done by using Epi Info 7 software. Descriptive statistics, frequency percentages were determined for categorical variables and mean with standard deviation for continuous variables. Student t' test or ANOVA was used to find the association of drinking water intake with socio-demographice variables like age and gender.

Ethical Aspects: Prior permission was taken from RHTC in-charge to go ahead with the study. Objectives of study were explained to the participants during the visit. Informed consent was taken from the participants in the study. Participants were fully assured regarding the confidentiality and anonymity of the information provided by them. Confidentiality of information gathered from study subjects was maintained in accordance with the principles embodied in the declaration of Helsinki and International guidelines for ethical review of epidemiological studies.

RESULTS

A Total of 400 participants from selected households in the Rural Health Training Center Area, Mashobra had been surveyed. Most of the participants belongs to 20-59 years (64%) followed by 18.5% adolescents, 7.5% above 60 years of age,5.3% in 5-9 years age group and 4.8% were under 5 year of age. Among participants, 53.5% were males and 46.5% were females. (Table 1) .

Table-1. Age and gender distribution of the participants

Variables		Frequency	Percent
Age Groups	≤5 years	19	4.8
	5-9 years	21	5.3
	10-19 years	74	18.5
	20-59 years	256	64.0
	≥60 years	30	7.5
Gender	Male	214	53.5
	Female	186	46.5
	Total	400	100.0

Among the study participants, main source (75.5%) of drinking water supply was IPH (Irrigation & Public Health) which was household piped water supply. While 10.25% used natural sources like bowri, 9.75% used Public Tap and 4.5% used Hand pump for the drinking water supply. In the present study, 49.5% participants used any method of water purification while 50.5% didn't use any method of water purification. Among those who used any method of water purification, 12.75% used boiling, 23.25% RO/UV and 13.50% candle filter as a method of water purification (Table 2).

Table 2: Drinking water source and method of purification

Main Source of water supply	Frequency	Percent
Natural Sources/ Bowri	41	10.25
Public Tap	39	9.75
Hand Pump	18	4.5
IPH Supply	302	75.5
Method of water purification		
Boiling	51	12.75
RO/UV**	93	23.25
Candle Filter	54	13.50
Any method of purification	198	49.5
No method of Purification	202	50.5
Total	400	100.0

*IPH means Irrigation & Public Health ** RO/UV means Reverse Osmosis/Ultra-Violet

In the present study, mean drinking water Consumption per day was 1.33±0.76 Liters / day. It was significantly higher in males as compared to females. (1.44 ±0.84 Vs 1.21± 0.65 Liters /day) Mean drinking water Consumption per day was significantly higher(1.50±0.79 Liters / day) in the age group of 20-59 years followed by 1.30±0.61 Liters / day in >60 years,1.12±0.62 Liters / day in adolescents,0.55±0.43 Liters / day in 5-9 years age group and 0.55±0.43 Liters / day in the under 5 age group.(Table 3).

Table 3: Association with drinking water consumption with age and gender

	Variables	**N**	**Mean**	**Std. Deviation**	**P value**
Gender	Male	214	1.4299	.83729	0.004
	Female	186	1.2096	.65174	
Age Group	<5 years	19	.5526	.42962	0.000
	5-9	21	.7619	.40679	
	10-19	74	1.1182	.61686	
	20-59	256	1.4951	.78947	
	>60	30	1.2997	.61057	
	Total	400	1.3275	.76374	

DISCUSSION

In the current study, main source (75.5%) of drinking water supply was IPH (Irrigation & Public Health) which was household piped water supply while 10.25% study participants used natural sources like bowri, 9.75% used Public Tap and 4.5% used Hand pump for the drinking water supply. Our study finding were similar to census 2011 and the study done by Pachori R in rural area of Tamil Nadu (https://censusindia.gov.in; & Pachori, R. 2016).

In the present study, 49.5% participants used any household method of water purification while 50.5% didn't use any household method of water purification. These finding were in contrary to those reported by Pachori R for the rural area of Tamil Nadu (Pachori, R. 2016). We all know that regular tap water being supplied directly to homes might seems

clear but sometimes carries various sorts of health-affecting bacteria, viruses and other harmful substances such as fluorine compounds, chlorine, mercury, lead, pesticides and other types of waste particles when it got contaminated in the way specially when there was intermittent water supply. Its consumption can lead to serious health issues, and sometimes the result can be massively harmful. As per various health researches contaminated water leads to many diseases like- diarrhea, cholera, dysentery, typhoid, hepatitis A/E and many other water borne diseases (/www.moonbowliving.com).

In our study we found that in every age group and gender, mean drinking water Consumption per day was less than that of the recommendation by various health agencies for that age group and gender (www.betterhealth.vic.gov.au; Ohno, K. *et al.*, 2018; & Vieux, F., & Maillo, M. 2017). We all knows that water contributes to regular bowel function, optimal muscle performance, Optimal functioning of various organ system and clear, youthful-looking skin. However, failing to drink enough water can cause dehydration and adverse symptoms, including fatigue, headache, weakened immunity, frequent illness, poor skin health, constipation reduction in kidney function ,higher frequency of urinary tract infections, confusion, lower wound healing, hypertension, stroke and many other diseases which can be prevented by consuming adequate amount of water (www.medicalnewstoday.com; www.webmd.com; & healthcareassociates.com).

CONCLUSION

Appropriate emphasis should be given by the health providers in RHTC areas on IEC & behaviour change communication to create awareness among villagers on the importance of drinking water consumption and methods of water purification at domestic level by using various media. Health promotion campaigns should be organized by the health care workers in this area to encourage the creation of an environment favoring drinking water consumption.

Limitations

The study had limitations. First, this study is based on self-reporting by the participants, so subject to there may be some reporting biases. Secondly, in our study, we had taken only history about drinking water consumption but not about other Beverages such as milk, juice, teas coffee, cold drinks etc, which are composed mostly of water and can also contribute to daily water intake.

Acknowledgement

We would like to acknowledge the support and co-operation of all the health staff of RHTC Mashobra for providing assistance and other support to carry out the study smoothly. We also express our sincere gratitude to all the respondents who participated in this study for giving us time to interview them. We are also grateful to the all Residents of department of community medicine and specially MBBS Students of 2019 Batch for their extensive collaboration, without which this study could not have been conducted.

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