खण्ड 44 संख्या 2 अप्रैल से जून, 2021 आई.एस.एस.एन.-0253-6803
Volume 44 Number 2 April to June, 2021 ISSN- 0253-6803

स्वास्थ्य एवं जनसंख्या : परिप्रेक्ष्य एवं मुद्दे

Health and Population: Perspectives and Issues

आरोग्यम् सुखसम्पदा

राष्ट्रीय स्वास्थ्य एवं परिवार कल्याण संस्थान

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The National Institute of Health and Family Welfare

An autonomous organization, under the Ministry of health and Family Welfare, Government of India

बाबा गंगनाथ मार्ग, मुनीरका, नई दिल्ली-110067

Baba Gangnath Marg, Munirka, New Delhi –110067

Subscrption

	In India	**Foreign**
Annual:	Rs. 200.00	$200 (US)
Single Copy:	Rs. 50.00	air-mail postage
Individual Life Membership:	Rs. 2000.00	

Bank Drafts may be drawn in favour of the

Director, The National Institute of Health and Family Welfare, New Delhi

All editorial correspondences should be addressed to:

The Editor, Health and Population: Perspective and Issues

The National Institute of Health and Family Welfare,

Baba Gangnath Marg, Munirka, New Delhi-110067, INDIA

E. mail: editor@nihfw.org

Website: www.nihfw.org(link:http://WPublication.aspx?id=3)

July 2021/ 100 Copies

Design and Layout
Mrs. Shashi Dhiman
Mr. Vinod Kumar

Hindi Translation
Mrs. Kalpana
Mrs. Monika

Technical Support
Mr. Surender Prasad

खण्ड 44	संख्या 2	अप्रैल से जून, 2021	आई.एस.एस.एन. 0253-6803
Volume 44	Number 2	April - June, 2021	ISSN 0253-6803

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HEALTH AND POPULATION: PERPECTIVES AND ISSUES

(INCORPORATING NIHAE BULLETIN (EST.1968) AND THE JOURNAL OF POPULATION RESEARCH (ESTD. 1974))

VOLUME: 44	NUMBER 2	April-June 2021

Health and Population:
Perspectives and Issues, 44 (2) 51-54 / April-June 2021

Editorial

Health Diplomacy: Building Bridges between Public Health and Diplomacy

***Neeta Kumar, **Abha Mangal and ***Sanjiv Kumar**

* Professor, Faculty of Dentistry, Jamia Milia Islamia, Okhla, New Delhi-110025; E-mail: neetasanjiv@gmail.com.
** Head, Department of Community Health, Saint Stephen's Hospital, New Delhi-110054; E-mail: abha.mangal@gmail.com.
*** Former Senior Advisor, United Nations Children's Fund, M15, South Extension II, New Delhi-110049;
E-mail: drsanjivkumardixit@gmail.com.

"It was enough for a nation to look after itself. Today it is no longer sufficient" said Robert Cooper Europe's eminent diplomat[1]. This is particularly true in health arena. The current pandemic of Corona Virus Disease 2019 (COVID-19) has brought to attention many gaps in the global health system; one of them is Health Diplomacy which has not received adequate attention in public health practice, academics and research, more so in India and other emerging economies. Health diplomacy has immense potential in streamlining effective, timely, collaborative and coordinated response at the global, national and local levels to address the existing as well as future health problems. In the words of Tedros Adhanom Ghebreyesus, DG, WHO, "Global health challenges have increasingly moved centre-stage, and the COVID-19 pandemic has only underscored the centrality of health to social, economic and political stability and to 2030 Agenda for Sustainable Development Agenda."

Evolving Field of Diplomacy

Diplomacy is referred to as the art and practice of conducting negotiations[2]. According to the Oxford Dictionary, the word diplomacy, a noun, means 'the profession, activity, or skill of managing international relations, typically by a country's representatives abroad', 'the art of dealing with people in a sensitive and tactful way' while the Cambridge Dictionary says 'the skill in dealing with people without offending or upsetting them.'

Traditional approach to diplomacy was confined to a club like diplomats to diplomats who represented their governments and defended security, trade and economic interests of their respective countries in bilateral or multilateral dialogues. Diplomacy was commonly understood to mean the conduct of international relations by the diplomats from the ministries of foreign affairs regarding 'hard power' issues of war and peace; and as the countries became economically competitive, economics and trade were included. Recently, 'soft power issues' emerged as an important part of diplomacy as many international agreements on environment and health as some of these have 'hard' ramifications on national economies[1]. In the recent times, it has moved to multi-level, multi-partner interactions with both diverse and multiple actors, formal and informal, covering many more areas such as public health, migration, climate change, diseases, pandemics, equity and other national interests. The relationship in modern diplomacy has also evolved from formal to informal, bilateral and hierarchical to horizontal and multilateral. In bilateral negotiations, it was simple push or pull effect between the negotiating parties but has become complex nonlinear "U effect" in multilateral negotiations. Recently, networking has emerged as an important attribute of successful

diplomacy. It has also included subject specialists in the diplomatic teams. The negotiation process of Sustainable Development Goals (SDGs) as compared to Millennium Development Goals (MDGs) reflects two main shifts in the global diplomacy. The first is the shift to multi-stake holder and the second, centrality of health in every SDG. Global health diplomacy has proved to be an integral component and outcome of every round of SDG negotiations for all SDGs. MDG negotiations were quite different as these were closed door decision-making process in late 1990s that resulted in the adoption of MDGs in 2000[3].

Public Health: An Integral Part of Modern Diplomacy

Historically, health diplomacy has focused on international collaboration to protect human and commercial interests against the spread of infectious diseases. In 1851, European diplomats and physicians met in Paris to collaborate to secure their populations and commercial interests against quarantine-able diseases such as cholera, plague and yellow fever. Health has recently gained importance as an important input for economic growth. The broad political, social and economic implications of health issues have brought more diplomats into the health arena and more public health experts into the world of diplomacy. Interconnectedness of peace, development and health has received wide recognition. Currently, many embassies have added either health in the portfolio of existing diplomats or an exclusive diplomat looking after health issues. For example, US-based embassies/missions of European Union, Canada, Denmark, and France, Kuwait, Saudi Arabia, South Africa; and US embassies in India, China, Brazil, South Africa and Geneva have added health officials as their diplomatic officials[4]. This trend is catching up across the world and likely to accelerate in future.

Health Diplomacy

Health diplomacy, a relatively new discipline, has no commonly-accepted definition. Some of the definitions below in the world of literatures help us understand what it means:

1. A political change activity that meets the dual goals of improving global health while maintaining and strengthening international relations abroad particularly in conflict areas and resource poor environments. (Novotny and Adams 2007).[5]
2. Multilevel, multi-actor negotiation process that shape and manage the global policy environmental for health.[1]
3. Winning hearts and minds of people in poor countries by exporting medical care, expertise and personnel to help those who need it. (William Fauci 2007).[6]
4. The cultivation of trust and negotiation of natural benefits in the context of Global Health Goals.[7]

In view of the above, we may describe health diplomacy as “Improving Global Health by strengthening international relations”. This also includes interactions among countries at the regional levels as many strong regional groups of countries have emerged. When applied at the global level, it can be referred to as Global Health Diplomacy. However, health diplomacy approach can be applied effectively to achieve the public health goals in day to day public health work at the national, sub-national and even local levels to strengthen the engagement of various ministries and non-state stake-holders.

Domains of Health Diplomacy

Health diplomacy builds on five major domains- Public Health, International Health, Global Health, International Relations and Leadership skills for negotiation and other related competencies. Public health skills and updating these in new disease outbreaks are foundational skills for health diplomacy. So, successful health diplomats should have a good knowledge of Global Health and other public health related domains. In addition, they need to acquire international relations skills which were earlier confined to diplomats only.

Basic and In-service Capacity Building for Health Diplomacy

The COVID-19 had demonstrated the vital importance of global solidarity. It is important for public health professionals to acquire health diplomacy skills to remain relevant, effective as public health leaders in the current scenario or run the risk of becoming marginalized. Health diplomats need to carefully consider and be knowledgeable about the larger ecosystem in which to negotiate for improving the global health. Health is no longer looked at through medical lenses alone but also through lenses such as equity, economy and other health determinants, making it necessary for public health physicians to look at health in increasingly more complex systems which have global ramifications. Diplomacy skills are vital for public health professionals to become effective in their work even at the local, state and national level. These skills are important in dealing with other sectors, departments and ministries, multilateral systems and ever expanding range of actors to achieve health goals and in the existing disaster management framework put in place under the National Disaster Management Act, 2005. In the emerging ecosystem, traditional segmented approach is destined to fail especially in a health crisis situation. A more holistic, inclusive, comprehensive and coordinated strategy is required to tackle these truly global challenges[3].

Currently, the health diplomacy skills required for the emerging health problems are neither imparted in MD nor in MPH or in MBA (Health, Hospital and Health Technology Management) in India. The authors are not aware of any in-service training in this area in India. There is a need of incorporating health diplomacy in the Postgraduate Community Medicine, Public Health and Health Management curricula. For those who are already part of the public health system and academia, in-service trainings need to be designed and implemented. A recent online CME conducted by the authors under Community Health Department of Saint Stephen's Hospital, New Delhi, was a small step to fill in this gap.

Conclusion

COVID-19 and other Global Health challenges have moved Health Diplomacy to the centre-stage. The growing awareness of social, political and economic determinants of health; and recent international instruments such as SDGs, equity, climate change, etc. have also highlighted the importance of health in diplomacy. Successful global health diplomacy relies on political and diplomatic experience and practice combined with sound public health knowledge. Diplomacy skills are vital for the public health professionals to become effective leaders on public health matters at all levels of their work from local to global. Traditional bilateral government to government character of diplomacy at intergovernmental platforms confined to security, economy and trade has been replaced by multi-stakeholders, informal platforms and expanded to include health, environment, climate change, equity, etc. in modern diplomacy. Many countries have included health diplomats in their embassies and foreign missions. In view of this, health diplomacy assumes a significant position. Training in diplomacy needs to be included in both basic and in-service

training of public health professionals. It needs to include five domains- public health, global health, international health, international health and leadership soft skills for expertise in negotiations.

References

1. Berridge GR. (2005). Diplomacy theory and practice. Palgrave McMillan, London and New York.
2. Kickbusch I, Silberschmit G, Buss P. (2007). Global health diplomacy: The need for new perspectives, strategic approaches and skills in global health. Bull World Health Organ.; 85 (3): 230-232 [cited on 03.03.2021]
   Available on:file:///C:/Users/ssh/Downloads/Global_Health_Diplomacy_The_Need_for_New_Perspecti.pdf.
3. Kickbusch I, Nikogosian H, Kazatchkine M & Kokeny M. A. (2021). Guide to global health diplomacy. Better health – improved global solidarity – more equity. Global Health Centre, Geneva, 14 [cited on 03.03.2021] Available at https://repository.graduateinstitute.ch/record/298891.
4. Brown M.D., Bergmann J.N., Novotny, T.E. et al. (2018). Applied global health diplomacy: Profile of health diplomats accredited to the United States and foreign governments. Global Health 14, 2 [cited on 03.03.2021] 0
   Available at https://globalizationandhealth.biomedcentral.com/articles/10.1186/s12992-017-0316-7#citeas.
5. Adams V, Novotny TE & Leslie H. (2008). Global Health diplomacy. Med Anthropol. 27(4): 315–323.
6. Fauci A. (2007). The expanding global health agenda: A welcome development. National Medicine; 13: 1169-1171.
7. Katherine Bond. (2008). Commentary: Health security or health diplomacy? Moving beyond semantic analysis to strengthen health systems and global cooperation. Health Policy and Planning; 23 (6): 376–78. [Cited 03.03.2021]
   Available on: https://academic.oup.com/heapol/article/23/6/376/572215.

Health and Population:
Perspectives and Issues, 44 (2): 55- 72/ April-June 2021

MCH Status Rankings of 36 States/UTs and 640 Districts of India: Factor-Scores Based on 14 Key Indicators, NFHS-4

*** S.C.Gulati and **Rajesh Raushan**

* Former Senior Consultant, Policy Unit, NIHFW, New Delhi-110067; E-mail: scgnihfw@gmail.com.
**Assistant Professor and Post-Doctoral Fellow, Indian Institute of Dalit Studies, Delhi; E-mail: rajesh.rajiips@gmail.com.

Associate Editor:
Prof. M. K. Mallick, Acting HoD, Department of Management Sciences, NIHFW, New Delhi.

Reviewers:
Dr. D.K. Yadav, Asst. Professor, Department of Statistics and Demography, NIHFW, New Delhi.
Dr. Monika Saini, Asst. Professor, Department of Social Sciences, NIHFW, New Delhi.

Abstract

Maternal and Child Health (MCH) care utilization diversities amongst the states and districts across India have resulted in huge regional variations in maternal, neonatal, infant and child mortality, and morbidity. MCH status in 36 States/UTs and 640 Districts of India has been analyzed by 14 key indicators representing three crucial dimensions viz. healthcare utilization, medical conditions and nutrition-associated health aspects of mothers and children from NFHS-4, 2015-'16, all India survey. Principal Factor solution-based on Kaiser Criterion of Eigen Values greater than unity facilitated the 3 Factor Solution representing the three dimensions. Thereby Oblique Rotated Factor Structural Coefficients were utilized for eliciting three factor scores representing the three dimensions, and which in turn, were utilized for weighted factor score representing the MCH Status of all the units. MCH Status situation analysis can facilitate focused regional health initiative towards improvements in MCH Status across India.

Key words: *MCH Status, Women's Empowerment, Factor Scores, Oblique Rotation.*

Introduction

International and national perspectives over prioritization of Maternal and Child Health (MCH) Status encompassing three crucial underlying dimensions viz. MCH care utilization, MCH medical conditions and MCH nutritional aspects; closely interlinked with health outcomes of mothers and children have been well documented. MCH Status structural linkages with socio-economic and cultural factors have always been contended to be crucial for overall improvement in the quality of life and wellbeing of mothers and children. The structural linkages between MCH status and socio-cultural factors have facilitated formulation and adoption of Millennium Development Goals (MDGs) in 2000 and Sustainable Development Goals (SDGs) in 2015. The World Health Organization's MCH Cluster's programme aimed at supporting developing countries to reduce the maternal, neonatal and under-five mortality and morbidity, and to enhance the quality of life and wellbeing of women and children (WHO, 2010).

Structural shifts in India's population and health policies got initiated at Cairo's International Conference on Population and Development (ICPD) in 1994, in which India was also a signatory to the Plan of Action, endorsed by 179 participating countries in the Conference. The Cairo's conference Plan of Action (PoA) centered on considerations like population policies should not have the sole concern of fertility reduction

but of reproductive health, reproductive rights and gender equity. The concerns over education of girls, gender equity and empowerment of women; infant, child and maternal mortality reduction; and the provision of universal access to reproductive health services, including family planning and sexual health were raised during the Cairo conference.

Paradigm shifts in India's population and health policies, and prioritization of MCH services since 1994 ICPD Cairo Conference got reflected in the National Population Policy official document of 2000 (NPP, 2000). NPP 2000 aims at achieving RCH goals like 80 per cent Institutional deliveries, 100 per cent safe deliveries, reduction in MMR well below 100 and IMR below 30, meeting the unmet need of contraception, etc. along with social targets like women empowerment, enactment of minimum age at marriage act, etc. to be achieved by 2010. However, despite concerted efforts at the national and sub-national levels brought down IMR only to 33 by 2017 and MMR to only 130 by 2016 (SRS, 2017). Furthermore, wide interstate variations in MMR also got discerned to range from 46 in Kerala to 237 in Assam during 2014-'16 and IMR from 8 in Goa and 10 in Kerala to 47 in Madhya Pradesh in 2016. Similar variations in institutional and safe deliveries, children immunization, etc. and several other goals get reflected in official policy documents (NRHM 2005; NHP 2012, NHM 2017).

India adopted several flagship programmes for MCH care like *Janani Suraksha Yojana* (JSY) in 2005 and *Janani and Shishu Suraksha Yojana* (JSSY) in 2011 which entitled all pregnant women delivering in public health institutions to absolutely free and no delivery expense including caesarean section. The initiatives stipulated free drugs, diagnostics, blood and diet, besides free transport from home to institution, between facilities in case of a referral and drop back home. Similar entitlements have been put in place for all sick new-born accessing public health institutions for treatment till 30 days after birth. In 2013, this has been subsequently expanded to sick infants and antenatal and postnatal complications. Furthermore, *Pradhan Mantri Surakshit Matritva Abhiyan* (PMSMA) was launched in 2016 to carry forward the vision of ensuring quality antenatal care and high risk pregnancy detection in pregnant women. Unfortunately, there is little evidence that maternity has become significantly safer in India over the last 20 years despite the safe motherhood policies and programmatic initiatives at the national and sub-national levels. Newer initiatives and interventions like Comprehensive Abortion Care, Midwifery Services, Maternal Death Review, Maternal Death Surveillance and Response, etc. have also been formulated, implemented and institutionalized by all the states since 2017 for furthering the vision of safe motherhood and child survival strategies.

Major causes of maternal deaths in India have often been identified as higher prevalence of anaemia among pregnant women, obstructed labour, hemorrhage and sepsis[1]. Similarly, major causes of newborn deaths in India have been identified as pre-maturity, neonatal infections, intra-partum related complications or birth asphyxia and congenital malformations[2]. Overall major causes of infant and child deaths are pneumonia, prematurity and low birth weight, diarrhoeal diseases, neonatal infections and birth asphyxia and birth trauma. Geographical vastness and socio-cultural diversity across India may also be contributing to accessibility and utilization of MCH care facilities and services which could be a factor of regional variations in material and child mortality and morbidity.

Objectives

MCH Status being multidimensional can't be captured by any single variable. We need to have a composite index encompassing key dimensions like healthcare utilization, health status and medical conditions of mothers and children. The indices for different States/UTs would facilitate proper budgetary allocations and prioritization of different healthcare services to alleviate regional variations in mortality and morbidity; and

bring about optimal results under the constrained resource regime in India. The composite indices depicting MCH status and its three underlying dimensions would be elicited using factor analytical technique, database of the selected MCH indicators out of the 93 available MCH indicators for 36 States/UTs and 640 districts of India.

Database for the Study

Database for this study has been drawn from Fact Sheets in Excel format on the 93 key MCH indicators for 640 district and 36 States/UTs from the National Family Health Survey 2015-16 (NFHS-4). Data on the key indicators provide information on all the crucial dimensions of MCH Health Care comprising maternal and delivery care, child immunization, treatment of children, medical conditions like anemia, blood pressure, hypertension, nutritional status of adult women and children, biometrics like height and weight by age, etc.

The missing values for some variables of some districts were substituted by the values of the indicators for STs/UTs, which possibly are more realistic rather than by the national values. This could have been the option for treatment of the missing data in the SPSS package for factor solutions and factor scores for rankings of states and districts of India.

Sample Design of Database in NFHS-4.

The NFHS-4 survey sample design was a stratified two-stage sample with 2011 census served as the sampling frame for the selection of PSUs[3]. Selected PSUs were villages in rural areas and Census Enumeration Blocks (CEBs) in urban areas. PSUs with fewer than 40 households were linked to the nearest PSU. In every selected rural and urban PSU, a complete household mapping and listing operation was conducted prior to the main survey. Selected PSUs with an estimated number of at least 300 households were segmented by considering approximately 100-150 households. Two of the segments were randomly selected for the survey using systematic sampling with probability proportional to segment size. Therefore, an NFHS-4 cluster is either a PSU or a segment of a PSU. In the second stage, in every selected rural and urban cluster, 22 households were randomly selected with systematic sampling procedure.

Four Survey Schedules such as Household, Woman's, Man's and Biomarker were canvassed in local language using Computer Assisted Personal Interviewing (CAPI). In the Household Schedule, information was collected on all usual members of the household and visitors who stayed in the household the previous night as well as socio-economic characteristics of the household, water and sanitation, health insurance, number of deaths in the household in the three years preceding the survey, etc.

Information on the woman's characteristics, marriage, fertility, children's immunizations and childcare, nutrition, contraception, reproductive health, sexual behaviour, HIV/AIDS, domestic violence, etc. was canvassed in the Woman's Schedule. The Man's Schedule covered the man's characteristics, marriage, his number of children, contraception, fertility preferences, nutrition, sexual behaviour, attitudes towards gender roles, HIV/AIDS, etc. The Biomarker Schedule covered measurements of height, weight and hemoglobin levels for children; measurements of height, weight, hemoglobin levels, blood pressure, and random blood glucose level for women aged 15-49 years and men aged 15-54 years.

Field Agencies and gathered information from 601,509 households, 699,686 women, and 112,122 men from 29 States and 6 Union Territories of India. Fact sheets for each State/UT and District of India are also

available separately. In addition to the 29 states, NFHS-4 also includes all six union territories for the first time and also provides estimates of most indicators at the district level for all 640 districts in the country as per the 2011 census.

Selection of 14 MCH Indicators

The information on the 93 indicators were broadly classified into broad categories like Family Planning, Maternal and Delivery Care for last birth during the five years prior to the survey, Treatment of Children aged below five years, Child Feeding Practices for last birth during the five years prior to the survey, Nutrition Status of Children aged below five years and Adults aged 15-49 years, Blood Pressure and Hypertension among adults (15-49 Yrs.), etc. Out of these 93 MCH indicators, the researchers selected 14 indicators based on their relevance to the three intended dimensions to be highlighted and partly scanning of the correction matrix of the MCH indicators.

Selection of the 14 key indicators for this study out of the 93 available indicators was primarily based on the theoretical relevance and methodological considerations for eliciting composite indices to represent the three crucial dimensions of MCH Status in 640 districts and 36 States/UTs. The selected indictors are in reference to the three MCH statuses primarily comprising MCH Care utilization, Medical conditions and Nutritional related aspects related to health status of mother and children. Abbreviated names and definitions of the 14 variables are furnished in Appendix Table-1.

Additionally, methodological considerations of having almost equal number of pertinent indicators for each of the intended dimensions to be elicited as per the objectives of the study resulted in the selection of the 14 relevant indicators.

Definitions of the 14 selected variables along with their descriptive statistics for 36 States/UTs and 640 districts are provided in Appendix Tables 1 to 3. The variables obviously refer to the extent of utilization of MCH Care and Status viz. antenatal, institutional and safe delivery, children immunization, exclusive breastfeeding up to six months, adequate diet for children between 6-23 months, utilization of health facilities for ARI amongst children; extent of anemia amongst pregnant women and children, blood-pressure and blood-sugar levels and BMI amongst women, and proportion stunted children.

Methodology

To begin with, the Principal Axis Method of Factoring has been utilized for eliciting the factor structure of the selected variables with number of factors based on the Kaiser Criterion of Eigen Value greater than unity[4]. The evolved factor structure thereafter is subjected to Oblique Rotation to get the simple structure to reflect the true nature of underlying dimensions. The simple structure implies factor loading of each variable to be much higher on one than on other factors. The rotated factor structural loadings and standardized variables are utilized to elicit the three factor scores for all the 36 States/UTs and 640 districts of India, as composite measures of the three underlying dimensions. Thereby the overall composite measure for MCH Status is elicited as the weighted average of the three factor scores with weights as the Eigen Values of the retained rotated factor structure[5].

State Level Oblique-Rotated Factor Structure of 14 Selected Variables

A perusal of the Oblique Rotated Factor Structure for 14 variables of 36 States/UTs is provided in Table 1. Perusal of higher factor loadings and nature of variables on the First Factor (F-I) facilitates its identification as MCH Care-Utilization**.** Variables depicting high factor-loadings on the first factor are percentage of mothers who availed of neonatal tetanus (Var34) during their last delivery, had full ANC (Var36), and had institutional delivery (Var43), and deliveries attended by a trained professional or so-called safe deliveries (Var46). Interestingly, it is found that percentage of children with fever or symptoms of ARI who were taken to a health facility (Var64) in the two weeks preceding the survey also depicts a higher factor loading on the first factor. Thus, nature of variables constituting the factor with relatively much higher factor-loadings facilitates its identification as MCH care utilization component of MCH Status.

Table 1

State/UT Level (N=36) Oblique Rotated Factor Structure of 14 Selected Variables

	Factors			
Variable	**Factor-I**	**Factor-II**	**Factor-III**	**Communalities**
Var34	.686	-.247	.137	**.735**
Var36	.797	.669	-.085	**.856**
Var43	.923	.360	.269	**.878**
Var46	.940	.342	.196	**.891**
Var64	.662	-.016	.646	**.700**
Var70	-.040	.675	-.469	**.547**
Var71	-.435	-.851	.303	**.775**
Var75	-.082	-.892	.419	**.832**
Var77	.682	.754	.134	**.873**
Var79	.144	-.392	.912	**.841**
Var81	.064	-.598	.646	**.587**
Var82	.180	-.301	.888	**.790**
Var84	.528	.584	-.482	**.702**
Var90	-.635	.183	-.610	**.671**
Eigen Values	**4.681**	**4.278**	**3.700**	

The Second Factor (F-II) gets identified as MCH Nutritional Status component of the MCH Status. Primary constituent variables of this factor are percentage of children aged 6-23 months receiving adequate diet i.e. Var70, percentage of children under five years who are stunted (height-for-age) i.e.Var71, percentage of women whose Body Mass Index (BMI) is below normal (BMI <18.5 kg/m2) i.e.Var75, and percentage of women who are overweight or obese (BMI ≥25.0 kg/m2) i.e. Var77. Also we find percentage of women with high level of Blood sugar (>140 mg/dl) i.e. Var84, also depicts much higher factor loading on this factor. As per the general expectations, the researchers find maternal care indicator viz. (Var36), also depicts much higher loading on this factor. Thus, the nature of variables with much higher factor loadings on the second factor helps in identifying this dimension as MCH Nutritional Dimension of the MCH Status.

The Third Factor (F-III) gets identified as MCH Medical Conditions**,** such as the major constituents of the factor are percentage of children age 6-59 months who are anaemic (<11.0 g/dl) i.e. Var79, percentage of

pregnant-women age 15-49 years who are anaemic (<11.0 g/dl) i.e. Var81, percentage women age 15-49 years who are anaemic (<11.0 g/dl) i.e.Var82. Also we find that percentage of women with very high (Systolic ≥180 mm of Hg and/or Diastolic ≥110 mm of Hg) i.e.Var90 also depict much higher loading on this factor. The authors also find that percentage of children with ARI symptoms during the last two weeks who got treated in a health facility i.e. Var64, depict higher factor loading on this factor. Overall, it was found that the anaemic women and children, and children with acute respiratory infections are the main constituents of this medical conditions factor.

Rankings of States/UTs on MCH Status Scale

The MCH Status Score (FS) is drawn as the weighted average of the three Factor Scores with weights as Eigen Values of the Oblique Rotated Factor Structure. Table-2 reveals that most of the EAG and Northeastern states depict very low MCH Status. It was also found that Bihar, Uttar Pradesh, Madhya Pradesh, Rajasthan, Jharkhand, Assam, Arunachal Pradesh, Nagaland, etc. are discerned to be ranking very low on the MCH Status scale depicting very low status. Except Odisha and Chattisgarh amongst the EAG states, all others depict very low MCH Status.

At the other end, it is seen that most of the Southern states viz. Tamil Nadu, Kerala, Andhra Pradesh, Karnataka, Telangana, etc.; rank very high on the MCH Status scale. It was seen that Punjab, J&K, Gujarat and Maharashtra among the larger states depict high status.

Some of the smaller States/UTs like Goa, Daman & Diu, Chandigarh, Puducherry, Lakshadweep, etc. are discerned to rank high on the MCH Status scale. Most of the Northern States like Jammu & Kashmir, Himachal Pradesh, Haryana, etc. get ranked in the middle order of the MCH Status scale.

Mapping of 36 States/UTs by MCH Status Category

Mapping of States/UTs by MCH status in five categories from Very-Low to Very High with Low, Moderate, High in between; is presented in Map 1. The category-wise colour scheme for the map is Dark Red for Very-Low (VL), Red for Low (L), Green for Moderate/Average (A), Light Blue for High (H) and Dark Blue for Very-High (VH).

The Very Low MCH Status category states and union territories form a contiguous belt comprising Nagaland, Arunachal Pradesh, Meghalaya, Assam which stretched up to Bihar, Jharkhand and Uttar Pradesh. The belt gets further extended with Low status category states of Odisha, Jharkhand, Madhya Pradesh, Uttarakhand which stretched up to Rajasthan.

The Average Status category states form another contiguous belt over the western parts of India comprised Gujarat, Maharashtra and Karnataka. Other larger states found in this category are Haryana and West Bengal, Sikkim and a UT Dadra Nagar Haveli.

Interestingly, the high status category larger states are south Indian states of Andhra Pradesh and Telangana. Another contiguous belt of the high status category comprised Punjab, Haryana, Jammu & Kashmir and Delhi in North India. The Very High status category larger states are Kerala and Tamil Nadu in the Southern India. Other very high status category smaller states and UTs are Chhattisgarh, Chandigarh, Goa, Puduchery and Andaman & Nicobar Islands located across India.

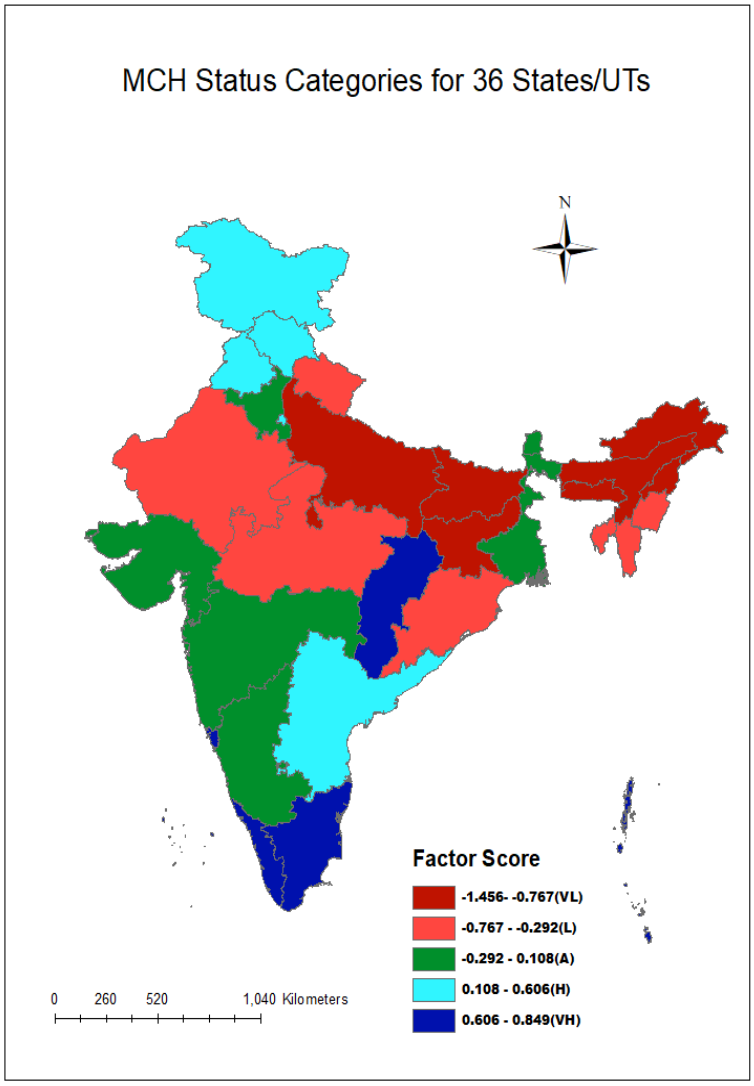
Table 2
Ranking of 36 States/UTs based on Weighted Composite/Factor Score (FS)

	Factor Scores			Weighted Factor Score		
State/UT	**FS1**	**FS2**	**FS3**	**FS**	**Rank**	**MCH Status Category**
EAG States	**(1)**	**(2)**	**(3)**	**(4)**		
Bihar	-0.965	-1.962	0.547	-0.885	34	VL
Uttar Pradesh	-0.773	-1.421	0.439	-0.657	31	VL
Madhya Pradesh	-0.324	-1.494	0.509	-0.499	29	VL
Rajasthan	-0.135	-1.385	0.452	-0.408	27	L
Jharkhand	-0.803	-1.967	0.779	-0.768	32	VL
Uttarakhand	-0.419	-0.57	-0.026	-0.355	26	L
Chhattisgarh	0.654	0.694	1.359	0.825	2	VH
Odisha	1.574	0.588	-0.55	0.637	8	H
Other Larger States						
Assam	-0.842	-1.03	-1.124	-0.948	35	VL
West Bengal	0.089	-0.402	0.054	-0.091	21	M
Punjab	0.661	0.417	0.416	0.491	10	H
Haryana	0.003	-0.506	1.093	0.108	16	M
Jammu & Kashmir	-0.019	0.756	0.149	0.29	14	H
Himachal Pradesh	-0.074	0.34	0.269	0.158	15	M
Gujarat	0.107	-0.77	0.433	-0.113	22	H
Maharashtra	0.442	-0.591	0.293	0.035	19	M
Karnataka	0.429	-0.345	0.086	0.061	18	M
Andhra Pradesh	0.931	0.079	0.326	0.452	11	H
Telangana	0.495	0.113	0.272	0.29	13	H
Tamil Nadu	0.335	1.525	0.425	0.753	5	VH
Kerala	1.529	1.437	-1.221	0.739	7	VH
Smaller States/Union Territories						
Delhi	0.585	0.208	0.363	0.378	12	H
Chandigarh	0.79	0.504	1.516	0.849	1	VH
Goa	1.574	0.588	-0.55	0.637	8	H
Daman & Diu	-0.244	0.892	1.529	0.607	9	H
Lakshadweep	1.506	1.087	-0.547	0.783	4	VH
Puduchery	0.685	1.915	-0.36	0.814	3	VH
A & N Islands	1.189	0.717	0.258	0.747	6	VH
D&N Haveli	0.065	-1.104	1.732	0.089	17	M
Sikkim	0.024	1.043	-1.568	-0.036	20	M
Tripura	-0.067	-0.52	-0.353	-0.293	23	L
Mizoram	-0.018	0.716	-2.172	-0.317	24	L
Manipur	-0.439	0.737	-2.259	-0.487	28	L
Meghalaya	-1.61	-0.244	0.216	-0.618	30	VL
Arunachal Pradesh	-2.656	0.776	-0.572	-0.854	33	VL
Nagaland	-3.059	0.712	-2.268	-1.457	36	VL

Overall, it was seen that the Very High and High Status category States/UTs are located over Southern, Western and Northern parts of India whereas Very Low and Low Status category States/UTs are located in

Northeastern, Eastern and Central parts of India. Possibly, district level map would highlight districts within state depicting different status compared to the state.

Map 1
36 States/UTs by MCH Status Categories



Source: Based on Factor-Scores (FSs in Col 4) of Table 2

District Level Oblique Rotated Factor Structure of 14 Selected Variables

Table 3 shows the oblique rotated factor structure based on the 14 variables of 640

districts of India. Figures in Table 3 reveals that the First Factor is primarily constituted by MCH Nutritional Status variables such as percentage of children aged 6-23 months receiving adequate diet (Var70), percentage of children under five years who are stunted (height-for-age) (Var71), percentage of women whose Body Mass Index (BMI) is below normal (BMI <18.5 kg/m2) i.e. Var75, and percentage of women who are overweight or obese (BMI ≥25.0 kg/m2) i.e. Var77, which are pure constituents of Factor-I in State

level Oblique Rotated Structure. As per general expectations we find maternal care indicator viz. (Var36), also depicts much higher loading on this factor.

Perusal of the Oblique rotated factor structure in Table 3 reveals that the Second Factor (F-II) is primarily constituted by extent of MCH Care-Utilization variables like percent mothers who during their last birth availed neonatal tetanus (Var34), had full ANC (Var36), had institutional delivery (V43), percent deliveries attended by trained professional or so called safe deliveries (Var46) and percent children with fever or symptoms of ARI in the last 2 weeks preceding the survey taken to a health facility (Var64).

Third Factor (F-III) is primarily constituted by variables depicting MCH Medical Conditions such as percent children aged 6-59 months who are anemic (<11.0 g/dl) i.e. Var79, percent pregnant women age 15-49 years who are anemic (<11.0 g/dl) i.e. Var81, percent women age 15-49 years who are anemic (<11.0 g/dl) i.e.Var82. Interestingly we find the dominant constituents of the three factors in District level factor structure are quite similar to that of the State level.

Table 3

District Level Oblique Rotated Factor Structure of 14 Selected Variables for 640 Districts

	Factors			
Variable	**Factor I**	**Factor II**	**Factor III**	**Communality**
Var34	-.219	.646	.105	.614
Var36	.697	.621	-.184	.689
Var43	.473	.885	.027	.840
Var46	.481	.893	.008	.858
Var64	.194	.719	.335	.582
Var70	.657	-.090	-.191	.523
Var71	-.815	-.316	.365	.687
Var75	-.775	-.021	.438	.659
Var77	.852	.434	-.176	.776
Var79	-.334	.141	.864	.749
Var81	-.364	.060	.760	.590
Var82	-.250	.191	.897	.811
Var84	.598	.162	-.253	.361
Var90	.241	-.492	-.352	.413
Eigen Values	**4.171**	**3.524**	**2.867**	

Categorization of 640 Districts on MCH Status Scale

State/UT specific MCH-Status categorization of 640 districts is provided in the following Table-4, from Very-Low (FS<-0.840) to Very-High (FS>0.603), are based on weighted factor scores (FS).

Table 4

Categorization of 640 Districts on MCH Status Scale in Each State/UT

	Number of Districts by Status-Category					
State/UT	**Very Low**	**Low**	**Moderate**	**High**	**Very High**	**Total**
EAG States						
Bihar	19	14	4	0	0	**37**
Uttar Pradesh	22	25	16	8	0	**71**

Madhya Pradesh	6	17	24	3	0	**50**
Rajasthan	6	9	12	6	0	**33**
Jharkhand	8	8	7	1	0	**24**
Uttarakhand	3	6	5	0	0	**14**
Chhattisgarh	7	7	4	0	0	**18**
Odisha	2	8	13	6	2	**31**
Other Larger States						
Assam	17	8	2	0	0	**27**
West Bengal	0	3	1	11	4	**19**
Punjab	0	0	0	8	12	**20**
Haryana	0	2	1	11	8	**22**
Jammu & Kashmir	1	2	2	5	12	**22**
Himachal Pradesh	0	1	2	3	6	**12**
Gujarat	0	4	7	11	3	**25**
Maharashtra	2	3	13	15	3	**36**
Karnataka	0	1	7	21	1	**30**
Andhra Pradesh	0	0	1	2	10	**13**
Telangana	0	0	0	5	4	**9**
Tamil Nadu	0	0	0	0	32	**32**
Kerala	0	0	0	2	12	**14**
Smaller STs/UTs						
Delhi	0	0	0	3	6	**9**
Chandigarh	0	0	0	0	1	**1**
Goa	0	0	0	0	2	**2**
Daman & Diu	0	0	0	0	2	**2**
Lakshadweep	0	0	0	0	1	**1**
Puduchery	0	0	0	0	4	**4**
A & N Islands	0	0	0	1	2	**3**
D&N Haveli	0	0	0	1	0	**1**
Sikkim	0	0	3	1	0	**4**
Tripura	0	1	2	1	0	**4**
Mizoram	3	3	1	1	0	**8**
Manipur	5	3	0	1	0	**9**
Meghalaya	2	2	1	1	0	**6**
Arunachal Pradesh	15	1	0	0	0	**16**
Nagaland	10	0	0	0	1	**11**
Total Number of Districts	**128**	**128**	**128**	**128**	**128**	**640**

Interestingly, some of the districts even in the low MCH Status States/UTs like in 8-EAG states showed high and very high status. Three districts in Madhya Pradesh viz. Indore, Bhopal and Jabalpur; six in Rajasthan viz. Ajmer, Tonk, Bundi, Banswara, Kota and Baron; eight in Uttar Pradesh viz. Muzaffarnagar, Meerut, Baghpat, Ghaziabad, Gautam Budh Nagar, Lucknow, Jhansi and Deoria; eight in Odisha viz. Sambalpur, Sundergarh, Subarnapur, Jagatsinghpur, Bolangir, Cuttack, Jharsuguda and Puri; and Purbi Singhbhum in Jharkhand revealed high status. Thus, except these 26 higher status districts, the rest of the 221 districts over the EAG states showed lower status.

In the five high and very high status Southern States of India, it was found that almost all the districts except one in Andhra Pradesh viz. Kurnool; and eight in Karnataka viz. Bagalkot, Bijapur, Gadag, Uttar

Kannada, Haveri, Gulabarga and Yadgir in average and Koppal in Low category Status. None of the districts in Kerala, Tamil Nadu and Telangana are in the average or lower categories of Status. Rest of the 88 districts out of 97 districts over the five Southern States is found to fall under the high and very high MCH Status categories.

In smaller States and Union Territories, it was seen that Chandigarh, Daman & Diu, Puducherry, Lakshadweep and Goa depict very high status. Similarly, six out of nine districts of Delhi are also in the very high category. Some of the districts over Northeastern states like Imphal West in Manipur; South Garo Hills in Meghalaya; Kalasik in Mizoram; North District in Sikkim; West Tripura and Dadra & Nagar Haveli are categorized in the High Status Category. Overall, districts in the Northeastern region show a low status.

Mapping of 640 Districts by MCH Status Category

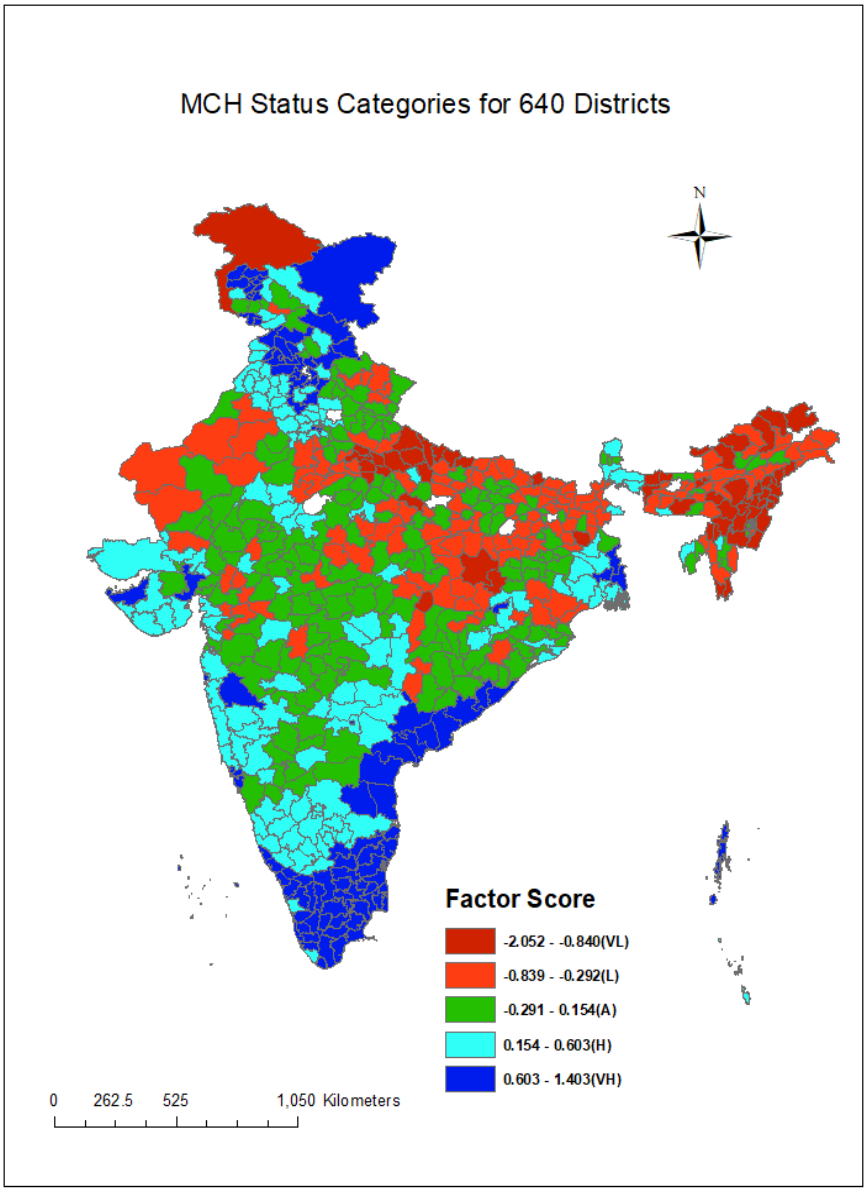
Mapping of 640 districts, stretched over 36 States/UTs of India, by MCH Status Category based on District Level weighted factor scores, is given in the Map 2. The category-wise colour scheme is similar to that of the state level map viz. Dark Red for Very Low (VL), Red for Low (L), Green for Moderate/Average (A), Light Blue for High (H) and Dark Blue for Very High (VH). Overall pattern of categories of MCH Status in the districts is obviously quite similar to that of in the respective States/UTs where these are located. Nevertheless, status of some of the districts is quite dissimilar to that of the State/UT, which are being highlighted and discussed here.

Interestingly, in Very Low Status Category States/UTs we find Dibrugarh and Kamrup show an average status as compared to Very Low in Assam; Gopalganj, Siwan, Munger and Sheikhpura show moderate as compared to Very Low in Bihar; Purbi Singhbhum show high in Jharkhand; Muzaffarnagar, Meerut, Baghpat, Ghaziabad, Gautam Budh Nagar, Lucknow, Jhansi and Deoria show high status in comparison to Very Low in Uttar Pradesh. In the Low Status Category States/UTs, it is observed that Puri and Jharsuguda show Very High Status in Odisha; and Sambalpur, Sundergarh, Cuttack, Jagatsinghpur and Subarnapur depict a high status as compared to the Low of Odisha; Indore, Bhopal and Jabalpur show high status in Madhya Pradesh; Ajmer, Tonk, Bundi, Banswara, Kota and Baron in Rajasthan. The authors also find Zunheboto showing the high status as compared to the low of Nagaland.

In Average MCH Status States/UTs we find Ahmedabad, Jamnagar and Porbandar depict very high status in Gujarat; Mumbai and Mumbai Suburban, Raigad and Pune depict very high status in Maharashtra; Nadia, North 24 Parganas, Hugli, Howrah and Calcutta depict very high status in West Bengal; and Jhajjar and Mohendragarh depict very high status in Haryana.

Map 2

Categorization of 640 Districts in 36 States/UTs based on MCH Status Values*



Source: Categories are Based on Weighted Factor Scores (FSs) out of
3 Factor-Scores for Each District Based on 14 Key Indicators, NFHS-4, 2015/16.
(**List, Rankings, and Factor Scores of 640 Districts can be made available by Authors On request*)

Most of smaller states/UTs in Northeastern India are in very low, low and average MCH Status categories but it was found that Imphal-West in Manipur; South-Garo Hills in Meghalaya and Kolasib in Mizoram, Tripura-West in Tripura; and North-District in Sikkim showed high status as compared to the lower status of ST/UT in which these are located in the Northeastern region.

Interestingly, in the higher status category States/UTs, it is observed that only Narainpur in Chhattisgarh and Doda in J&K have very low status. In Kerala, with very high MCH status; it was seen that

Thiruvananthapuram and Thrissur showed high status whereas in Tamil Nadu all the districts showed very high status as in the State.

Comparison of MCH Status and Economic Backwardness of 100 Districts Identified by Neeti Aayog (Earlier Planning Commission)

It may be of interest to note that many of the economically backward districts classified by the *Neeti Aayog* (Earlier Planning Commission) don't fall in the low MCH status categories in this study. Eight of the Backward Districts- Ramanathapuram and Virudhnagar of Tamil Nadu, Khammam and Warangal of Telangana, Kupwara and Baramula of Jammu & Kashmir, Waynad of Kerala and Nadia of West Bengal are discerned to fall in the high and very high status categories in this study[6]. Similarly, eight backward districts viz. Moga and Ferozpur in Punjab, Jalgaon and Gadcharoli in Maharashtra, Dakshin Dinajpur and Birbhum of West Bengal, Purbi Singhbhum of Jharkhand and Bolangir of Odisha are categorized in the High MCH Status category in this study. However, remaining 84 backward districts are classified in the moderate, low or very low MCH status categories in this study. Interestingly, the researchers in this study don't find any close/positive association between economy and MCH status. However, women with higher education in NFHS-4 were discerned to show a positive association with the selected indicators in this study. Possibly, women's education along with the healthcare utilization depicts both short as well as long run effects in improving the quality of life of vulnerable sections in the society.

Conclusion

Given the geographical vastness, socioeconomic and cultural diversity across 640 districts stretched over 36 States/UTs in India, strategic options for improvements across regions, possibly, can't be an overall universal prescription. Categorization of 640 districts into five categories viz. very-low, low, moderate, high and very-high of MCH Status by the elicited composite indices based on 14 selected indicators from NFHS-4 data, would facilitate strategic options to be adopted for each category towards faster and further improvements in MCH status in India. The MCH Status scores provided basis for the categorization of 36 States/UTs and 640 districts into five categories viz. Very-Low, Low, Moderate, High and Very-High. Proper scanning of the overall status and its three underlying dimensions through elicited factor scores would facilitate identification of the healthcare factors and initiatives towards faster improvements in the MCH status at regional and national level.

Recommendations

Geographical vastness and regional inequalities in MCH status and its main constituents viz. healthcare utilization, medical conditions, nutritional aspects of women and children health; across India calls for an extensive state and district level studies. These studies are necessary to highlight the regional health initiatives to curtail mortality and morbidity towards improvement in the quality of life of women and children.

Strong structural inter-linkages between MCH Status and socioeconomic and cultural factors necessitate extensive study to prioritize the holistic package comprising the socioeconomic and cultural factors and supply and demand side constraints of healthcare utilization and other MCH components as they are discerned to reinforce each other[7].

Thus, region specific holistic mix-package of health and socioeconomic initiatives would not only facilitate reduction in maternal, neonatal and under-five mortality and morbidity, but also enhance the overall quality of life of families and individual women, adolescents and children in India.

Appendix Table 1

List of Description of Selected 14 Variables under the Study

Abbreviated names	Description of 14 Variables under study	Foot Note
Var34	Mothers whose last birth was protected against neonatal tetanus (%)	1
Var36	Mothers who had full antenatal care (%)	2
Var43	Institutional Births (%)	
Var46	Birth assisted by doctor/nurse/LHV/ANM/other health personnel (%)	
Var64	Children with fever or symptoms of ARI in last 2 weeks preceding the survey taken to a health facility (%)	
Var70	Total children aged 6-23 moths receiving an adequate diet	3, 4
Var71	Children under 5 years who are stunted (Height- for- age) %	5
Var75	Women whose body mass index (BMI) is below normal (BMI<18.5 Kg/m^2) %	6
Var77	Women whose body mass index (BMI) is below normal (BMI>25.0 Kg/m^2) %	6
Var79	Children aged 6-59 months who are anemic (<11.0 g/dl) %	7
Var81	Pregnant women aged 15-49 years who are anemic (<11.0 g/dl) %	7
Var82	All women aged 15-49 years who are anemic (<12.0 g/dl) %	7
Var84	Blood Sugar level- High (>140 mg/dl) %	8
Var90	Very High (Systolic>180 mm of Hg and/or Diastolic >110mm of Hg) %	

Foot Notes:

1: Includes mothers with two injections during the pregnancy of their last birth, or two or more injections (the last within 3 years of the last live births), or three or more injections (the last within 5 years of the last birth), or four or more injections (the last within 10 years of the last birth), or five or more injections at any time prior to the last birth.

2. Full antenatal care is at least four antenatal visits, at least one tetanus toxoid (TT) injection and iron folic acid tablets or syrup taken for 100 or more days.

3. Based on the youngest child living with the mother.

4. Breastfed children receiving 4 or more food groups and a minimum meal frequency, non-breastfed children fed with a minimum of 3 Infant and Young Child Feeding Practices (fed with other milk or milk products at least twice a day, a minimum meal frequency that is, receiving solid or semi-solid food at least twice a day for breastfed infants 6-8 months and at least three times a day for a breastfed children 9-23 months, and solid or semi-solid foods from at least four food groups not including the milk or milk products food group.

5. Below -2 standard deviations, based on the WHO standards

6. Excludes pregnant women and women with a birth in the preceding 2 months.

7. Hemoglobin in grams per deciliter (g/dl). Among children, prevalence is adjusted for altitude. Among adults, prevalence is adjusted for altitude and for smoking.

8. Random blood sugar measurement (including those under medication)

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Var90	Very High (Systolic>180 mm of Hg and/or Diastolic >110mm of Hg) %	

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5. Below -2 standard deviations, based on the WHO standards

6. Excludes pregnant women and women with a birth in the preceding 2 months.

7. Hemoglobin in grams per deciliter (g/dl). Among children, prevalence is adjusted for altitude. Among adults, prevalence is adjusted for altitude and for smoking.

8. Random blood sugar measurement (including those under medication)

Source of Data and Footnotes: National Family Health Survey 2015-16 (NFHS-4): India, State, Union Territory & District Fact Sheets; Key Indictors by Residence; Variable Numbers have been retained for convenience as per the Indicators Fact Sheets (NFHS-4).

Appendix Table 2

Descriptive Statistics of State/UT Level Selected Variables under the Study

Descriptive Statistics					
Abbreviated Name	N	Minimum	Maximum	Mean	Std. Deviation
Var34	36	63.7	97.2	87.881	8.4919
Var36	36	2.4	65.9	29.778	17.5231
Var43	36	32.8	99.9	81.761	15.4803
Var46	36	41.3	100.0	83.597	13.9404
Var64	36	31.3	90.3	71.122	15.4644
Var70	36	0.0	30.8	11.989	7.7048
Var71	36	19.6	48.3	31.864	7.4098
Var75	36	6.4	31.5	17.692	7.1533
Var77	36	10.3	41.4	24.669	8.9523
Var79	36	19.3	84.6	54.825	14.3130
Var81	36	22.6	62.6	46.106	10.4052
Var82	36	24.8	79.5	51.733	13.1417
Var84	36	3.5	11.0	6.428	1.6606
Var90	36	.4	2.2	.806	.3906

Appendix Table 3

Descriptive Statistics of District Level Selected Variables under the Study

Descriptive Statistics					
Abbreviated Name of Variable	N	Minimum	Maximum	Mean	Std. Deviation
Var34	640	33.2	100.0	87.766	10.4698
Var36	640	0.0	83.0	21.549	16.9409
Var43	640	9.7	100.0	78.911	17.2942
Var46	640	14.4	100.0	81.170	15.5316
Var64	640	14.3	97.8	71.577	14.0191
Var70	640	-8.9	45.2	10.473	8.5049
Var71	640	12.4	65.1	35.957	9.9227
Var75	640	3.3	47.5	22.232	8.9387
Var77	640	2.4	48.7	18.899	9.0669
Var79	640	7.8	95.8	56.486	15.3081
Var81	640	-57.4	84.1	47.815	12.1121
Var82	640	13.1	84.1	51.527	12.2395
Var84	640	1.0	12.5	5.619	2.0864
Var90	640	0.0	5.3	.765	.5580

References

1. Prakash A, Swain S & Seth A. (1991). Maternal mortality in India: Current status and strategy for reduction. India Pediatrics, 28(12): 1395-1400.
2. Bassani Diego & Prabhat Jha. (2010). Causes of neonatal and child mortality in India. *The Lancet*, 376 (9755): 1853-1860.
3. Ministry of Health & Family Welfare (MoHFW). (2017). India report: National Family Health Survey 2015-16 (NFHS-4), International Institute for Population Sciences (IIPS) and ICF, Mumbai, India.
4. Harman H. (1960). Modern factor analysis. Chicago University Press, Chicago.
5. Kim Jae & Charles W. Mueller. (1978). Factor Analysis, Statistical Methods and Practical Issues, in Series Quantitative Applications in the Social Sciences; Sage University Press, London.
6. Neeti Aayog. (2019). List of Backward Districts, New Delhi.
7. Gulati S.C. & Ayusmati Das. (2018). Structural Linkages between Fertility, Infant Mortality and MCH Care in AHS States of India. Demography India, Vol. 47 (1): 01-11.

स्वास्थ्य एवं जनसंख्या :
परिप्रेक्ष्य एवं मुद्दे, 43 (2): 55-72/ अप्रैल–जून 2021

भारत के 36 राज्यों तथा केंद्रशासित प्रदेशों के 640 जिलों में मातृ एवं शिशु स्वास्थ्य (एम.सी.एच.) रैंकिंगः प्रमुखतः 14 संकेतकों पर आधारित, कारक स्कोर, एन.एफ.एच.एस – 4

'एस. सी. गुलाटी एवं ''राजेश रोशन

* एक पूर्व वरिष्ठ सलाहकार, नीति इकाई, राष्ट्रीय स्वास्थ्य एवं परिवार कल्याण संस्थान, नई दिल्ली –110067;
ई–मेलः scgnihfw@gmail-com

**सह–प्रोफेसर और पोस्ट–डॉक्टोरल फेलो, इंडियन इंस्टीट्यूट ऑफ दलित स्टडीज, दिल्ली;
ई–मेलः rajesh.rajiips@gmail.com

सह–संपादकः

प्रो. एम.के. मलिक, कार्यवाहक विभागाध्यक्ष, प्रबंधन विज्ञान विभाग, राष्ट्रीय स्वास्थ्य एवं परिवार कल्याण संस्थान, नई दिल्ली।

समीक्षकः

डॉ. डी.के. यादव, सहायक प्रोफेसर, सांख्यिकी और जनसांख्यिकी विभाग, राष्ट्रीय स्वास्थ्य एवं परिवार कल्याण संस्थान, नई दिल्ली।
डॉ. मोनिका सैनी, सहायक प्रोफेसर, सामाजिक विज्ञान विभाग, राष्ट्रीय स्वास्थ्य एवं परिवार कल्याण संस्थान, नई दिल्ली।

सारांश

संपूर्ण भारत के राज्यों और जिलों में मातृ एवं शिशु स्वास्थ्य (एमसीएच) के देखभाल उपयोगिताओं में वृद्धि के परिणामस्वरुप मातृ मृत्यु दर, नवजात मृत्युदर, शिशु मृत्युदर और बाल मृत्युदर में क्षेत्रीय असमानताएं देखने को मिलती है। भारत के 36 राज्यों/केंद्रशासित प्रदेशों और 36 जिलों में एमसीएच की स्थिति का विश्लेषण 14 प्रमुख संकेतकों के माध्यम से किया गया है। जिसे अखिल भारतीय सर्वे, एन.एफ.एच.एस–4 2015एवं 16 के अनुसार निम्न तीन प्रमुख आयामों के माध्यम से अभिव्यक्त किया जाता है यथाः माताओं और बच्चों के स्वास्थ्य देखभाल उपयोग, चिकित्सा स्थिति और पोषण से जुड़े हुए स्वास्थ्य पहलू। एक से अधिक अभिलाक्षणिक मान के कैसर मानदंडों पर आधारित मुख्य घटक (फैक्टर) समाधान की सहायता से 3 घटक (फैक्टर) समाधान तीन आयामों को दर्शाता है।इस प्रकार ओब्लिक रोटेटेड घटक (फैक्टर) स्ट्रक्चरल गुणांक का उपयोग तीनों आयामों का प्रतिनिधित्व करने वाले तीनों कारकों के स्कोर प्राप्त करने हेतु किया गया था, जिसके बदले में / अनुसार, सभी इकाईयों की एमसीएच स्थिति का प्रतिनिधित्व करने वाले भारित अवयवों के स्कोर के लिए किया गया था। एमसीएच स्थिति विश्लेषण, संपूर्ण भारत में एमसीएच स्थिति में सुधार की दिशा में केंद्रीकृत क्षेत्रीय स्वास्थ्य पहल की सुविधा प्रदान कर सकता है।

प्रमुख शब्दः एमसीएच स्थिति, महिला सशक्तीकरण, अवयव / कारक स्कोर , ओब्लिक (परोक्ष) रोटेशन

Health and Population:
Perspectives and Issues, 43 (2): 73- 84/ April-June 2021

Cost of Treatment and Patients' Perspectives about Functioning of *Pradhan-Mantri Jan Arogya Yojana* in a Tertiary Care Hospital in Uttarakhand

***Nishu Jha, **V.K. Tiwari, ***Yogesh Bahurupi,**
******Sameer Mohan Agarwal, *****Manisha Dhinwa,**
********Poorvi Kulshreshtha, *******Ravi Kant and ********Ajeet Singh Bhadoria**

* MPH student, E-mail: nishuesic@gmail.com; ***Assistant professor; Department of Community and Family Medicine;
**** Senior Resident, Department of Anaesthesiology, *****Associate professor, Department of Physiology; ******Director and CEO;
All India Institute of Medical Sciences, Rishikesh-249203, Uttarakhand (India).
** Dean of Studies, Professor and Head, Department of Planning and Evaluation, National Institute of Health and Family elfare, Munirka,New Delhi-110067.

Associate Editor:
Prof**.** Ramila Bisht, Jawaharlal Nehru University, New Delhi.

Reviewers:
Dr. Tapas Ranjan Behera, Department of Community Medicine, SCB Medical College, Cuttack, Odisha.
Dr. Balakrishnan Nair, Public Health Researcher, Auckland University of Technology, New Zealand.

Abstract

A descriptive study with the cross-sectional design was conducted at AIIMS, Rishikesh during 01 July -31 August 2019 to assess the cost of treatment and patients' perspectives about the functioning of the Pradhan-Mantri Jan Arogya Yojana (PMJAY) in a tertiary care hospital in Uttarakhand. A predesigned pretested semi-structured questionnaire was used for data collection for socio-demographic characteristics, knowledge/awareness about the PM-JAY, expenditures heads at AIIMS, Rishikesh, health-seeking behaviour, problems faced, and suggestions given by the patients. The study population included patients suffering from disease attending the AIIMS, Rishikesh and programme implementers of the PM-JAY. A total of 200 patients were interviewed from the stage of registration to discharge under the scheme. It was found that the PMJAY which is launched on 23rd September 2018, is running successfully with proper execution. The mean of patient's and attendant's wage losses were Rs. 4283 and Rs 3033 respectively. Mean duration between receiving all lab reports and start of treatment was 1.5 days. The average waiting time to meet the doctor was 12.2 min. The average waiting time at the pharmacy counter was 9 minutes. Almost all the patients were satisfied by the treatment provided under the PMJAY.

Key words: Ayushman Bharat, India, Universal Health Coverage, Out-of-pocket expenditure, Descriptive study, Mean wage loss

Introduction

The Universal Health Coverage requires adequate healthcare financing and manpower to provide financial protection to the economically poor population by covering their diagnostics, medicine, and even their health service costs.[1] Out of pocket expenditure (OOPE) acts as a part of the health financing landscape in all countries which rely on user fees and co-payments to mobilize the revenue and rationalize the use of

health services to contain the health system costs or to improve the health system efficiency and service quality.[2]

Households (HHs) with high healthcare needs are generally at an increased risk of spending more on healthcare services. Hospitalization cost was found to have a greater impoverishing impact, especially on the backward caste HHs.[3] Over 63 million persons are pushed to poverty every year due to the health care costs.[4] In the year 2011-'12, it was found that the share of out of pocket expenditure on health care as a proportion of total household monthly per capita expenditure was 6.9 per cent in rural areas and 5.5 per cent in urban areas.[5] This had led to an increasing number of households facing catastrophic expenditures due to health costs (18% of all households in 2011-12 as compared to 15% in 2004-05).[6] It was found that pooling funds from compulsory funding sources can spread the financial risks of illness across a population.[7] The *Rashtriya Swasthya Bima Yojana* (RSBY) was launched by the central government in the year 2008. Evidence suggests that RSBY and other such state health insurance programmes have increased access to hospitals, particularly private hospitals, by the poor patients but have not protected them against the financial burden.[8-11] The National Health Policy 2017 has included both these components by aiming at increasing the utilization of public health facility by 50 per cent from the current levels, and reducing the burden of Catastrophic Health Expenditure (CHE) of the households by 25 per cent by 2025.[12] It also aims at increasing the government health expenditure from 1.15 per cent to 2.5 per cent of the GDP by 2025.[12] India has taken the first move towards universal health care by launching the *Ayushmaan Bharat*- National Health Protection Mission.

Taking inspiration from the center's '*Ayushman Bharat*' scheme, the Chief Minister of Uttarakhand launched the *Atal Ayushman Uttarakhand Yojana*' on 25 December 2018. AIIMS, Rishikesh accepted this scheme from 25 December 2018 but no assessment had been done in AIIMS, Rishikesh to get the feedback about the functioning of the scheme. The present study is undertaken to assess the functioning of the PMJAY in terms of organizational structure, process, and procedures relating to the implementation of PMJAY besides patient's health-seeking behaviour and their satisfaction from services availed through PMJAY.

Methodology

A descriptive cross-sectional study among 200 patients eligible for the PM-JAY was conducted at AIIMS, Rishikesh from 01 July to 31 August 2019. The implementers of PM-JAY were also included. The structured patient's questionnaire consisted of knowledge/awareness about the PM-JAY, expenditures heads at AIIMS, Rishikesh; health-seeking behaviour, problems faced, etc. Patients were interviewed from registration to discharge counters. Data were analyzed using the SPSS version 23.0. Descriptive statistics were used to describe the categorical data as frequency or proportions. The study was approved by the Institutional Ethical Committee (Letter No: AIIMS/IEC/19/1205).[13]

Findings

The scheme was managed by the Nodal Officer and Faculty Coordinator, Accounts Officer, Junior Administrative Officer, and *Ayushman Mitras*. All these officials were reporting to the Medical Superintendent. There were two counters for registrations and only one counter for the discharge of patients under this scheme. All these counters remained open and functioned 24X7 all days. The majority of the patients who came for treatment under the PMJAY were suffering from cancers (30%) and kidney diseases, mainly of dialysis cases (13.5%). Patients of other health problems like haemorrhoids, hearing

problems, hernia, lipoma, neonatal care, psychotic disorders, varicose vein, glycogen storage disorders, and hemoperitoneum cases were also treated under this scheme.

Socio-demographic and Economic Profile of the Patients

Most of the patients were from the urban areas (60.5%). Male patients were more (55.5%) in number than the female patients (44.5%), the majority of the patients were married (80%) and the maximum belonged to the Hindu religion (90.5%). Educational status of patients revealed that 31 per cent had primary education, 20 per cent was just literate and 7 per cent was illiterate. About half (49%) had an income between Rs 5,000/- and 10,000/- per month and 30 per cent had an income between Rs. 10,000/- and 15,000/-. Most of the patients were housewives (39.5%) followed by daily labourers (16%).

Knowledge and Awareness about PM-JAY

Regarding knowledge of the PM-JAY scheme, 53% said it's a government health insurance scheme and 94.5% of patients said beneficiaries should be included under the SECC 2011 data. The majority (97%) of patients knew about the cashless treatment at both impaneled government and private hospitals, 68% of patients knew about the paperless treatment at both impaneled govt. and private hospitals. Whereas only 6% of patients knew that all family members are included under this scheme. It was noticed that most of the patients (94.5%) knew Aadhar Card should be linked with a valid bank account for this scheme. For the majority of patients (74%) Newspapers were the main source of information, followed by Television and Radio (28%), whereas only 3% of patients informed about receiving a letter from Prime Minister (Table 1).

Table 1
Knowledge and Awareness about PM-JAY

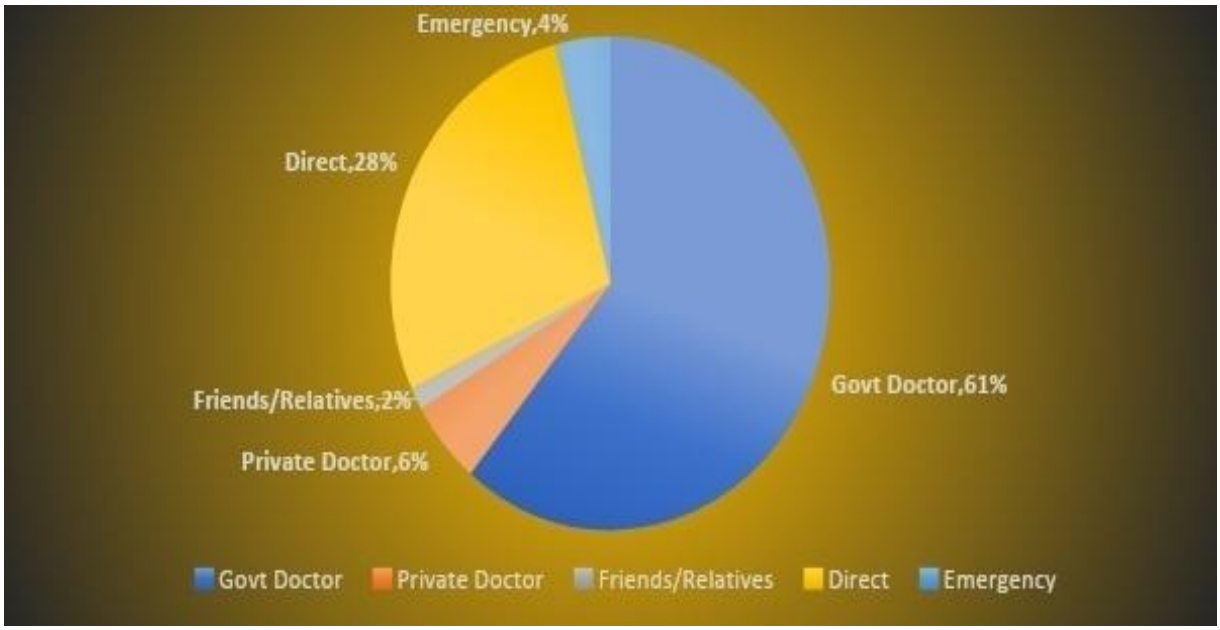
Knowledge about PM-JAY	**Frequency (N=200)**	**%**
Govt Health Insurance Scheme.	106	53
Beneficiaries Should Be Included Under The SECC 2011 Data.	189	94.5
Cashless Treatment At Both Empanelled Govt And Private Hospitals.	194	97
Paperless Treatment At Both Empanelled Govt And Private Hospitals.	137	68.5
Nearly 10 Crore Families Will Be Benefited.	22	11
All The Family Members Included.	12	6
Provide Rs 5 Lakhs For Health Insurance Annually.	122	61.0
Golden Card With Unique ID Required.	62	31
No Charges Required For Registration.	33	16.5
Investigation Done Before Treatment Under This Scheme Not Included.	2	1
Documents required for PMJAY		
Aadhar Card Linked With Valid Bank Account		
Respective Social Category Certificate	189	94.5
Family Structure	22	11.0
Identification Details and contact information	103	51.5
Scanned Copy Of Aadhar.	50	25.0
	57	28.5

Source of information about PM-JAY		
ANM and ANM	36	18.0
Newspapers	148	74.0
TV and Radio	56	28.0
Friends/Relatives/Work Place/Office	7	3.5
Health Awareness Camps	14	7.0
Letter Received From Prime Minister	6	3.0

Details of Referral to AIIMS, Rishikesh

When we look at the details of referral to these patients, majority (61%) of them were referred to AIIMS, Rishikesh by the government doctors while 5.5 per cent of them were referred to by the private doctors, whereas some patients (28%) who were staying nearby the hospital came directly and only 4% of patients came as an emergency cases (Figure 1).

Figure 1
Details of Referral to AIIMS, Rishikesh



Expenditures Incurred at AIIMS, Rishikesh under the PMJAY Scheme

As investigation and medicines were included under the scheme, majority of them did not have to pay for investigation and medicine. Although all meals were being provided to the patients, still the patient had to spend some amount of money on food. About 48.5 per cent of the patients spent between Rs. 101/- and Rs. 500/- on food whereas 5.5 per cent of them spent more than Rs. 2000/- on food. If we look into the patient's total wage loss, about 61 per cent of the patients had nil total wage loss and very few (9.5%) had more than Rs. 10,000/- wage loss. Since wage loss is not only limited to patients; so, attendants' wage loss was also studied. It was found that about 34.5 per cent of the attendants had nil wage loss and about 5.5 per cent of them had a wage loss of more than Rs.10,000/-. The mean patient and attendant wage loss

were Rs. 4283/- and Rs. 3033/- respectively. Since the transportation facility is not included under the scheme, patients had to spend a huge amount on transportation, about 25 per cent of them had to spend Rs. 501/- – Rs. 1000/- on transportation. When patient's total expenditure was analyzed which included (investigation, medicine, food, patients wage loss, attendant wage loss, transportation), majority of the patients (40%) had a total expenditure of Rs. 1001/- to Rs. 5000/-. The total bill generated for most of the patients (30.5%) from the scheme varied from Rs.10,001/- to 20,000/- (Table 2).

Table 2
Expenditures Heads at AIIMS, Rishikesh under the PMJAY

Expenditure Heads	Amount (in Rs.)	Frequency (N=200)	%	Mean (Rs.)
Investigation	Nil	130	65	739
	<500	11	5.5	
	501-1000	26	13	
	1001-2000	16	8	
	2001+	17	8.5	
Medicine	Nil	79	39.5	1038
	<500	41	20.5	
	501-1000	30	15	
	1001-2000	27	13.5	
	2001+	23	11.5	
Food	≤100	4	2	978
	101-500	97	48.5	
	501-1000	62	31.0	
	1001-2000	26	13.0	
	2001+	11	5.5	
Patient Total Wage Loss	Nil	122	61.0	4283
	<1000	8	4.0	
	1001-2000	26	13.0	
	2001-5000	13	6.5	
	5001-10000	12	6.0	
	10000+	19	9.5	
Attendant Wage Loss	Nil	69	34.5	3033
	<1000	20	10	
	1001-2000	40	20	
	2001-5000	40	20	
	5001-10000	20	10	
	10000+	11	5.5	
Transportation	100-500	35	17.5	2612
	501-1000	50	25	
	1001-2000	39	19.5	
	2001-5000	47	23.5	
	5000+	29	14.5	

Total bill generated	1000-5000	40	20	22639
	5001-10000	36	18	
	10001-20000	61	30.5	
	20001-30000	24	12	
	30001-50000	21	10.5	
	50000+	18	9	
Total expenditure (investigation, medicine, food, patient total wage loss, attendant wage loss, transportation)	<1000	2	1	12352
	1001-5000	80	40	
	5001-10000	53	27.5	
	10000+	65	31.5	

Source of Expenditure

Majority of the patients' main source of expenditure was savings and salary (79%) and some patients had to borrow money either from friends or relatives (53%) and some had to mortgage their household assets (5%). Only 1.5 per cent of patients said that their source of expenditure was pension.

Consequences of High Cost of Treatment

Due to the high cost of treatment, 47 per cent of the patients mortgaged their assets, 28.5 per cent of them informed about impoverishment in the family, 10.5 per cent stated that they left their jobs. Some of them informed about postponing of marriages/family events (9.5%), some had to cut down the expenditure on food (7%). Few patients (5.5%) sold their assets which added more mental trauma, especially the female patients whereas very few of them (0.5%) even stopped schooling of their children.

Distribution of Patients Based on Treatment Duration under the PMJAY

Majority of the patients (89.5%) said that there was no gap between registration and the start of the procedure. Around half (49%) of them stated that there was no gap between receiving lab reports and treatment given. Mean duration between receiving all lab reports and start of treatment was 1.5 days. Most of the patients (54.5%) were taking treatment in AIIMS, Rishikesh for 1-10 months; these were mainly patients of chemotherapy, radiotherapy, and dialysis. Looking at the number of days of hospitalization at AIIMS, Rishikesh; 75 per cent of the patients were hospitalized for 1-10 days which mainly included patients who were undergoing some surgeries, CVS, hernia patients whereas only 0.5 per cent of them were hospitalized for more than 30 days at AIIMS, Rishikesh**.** The mean waiting time to meet the doctor was 12.2 minutes while the mean waiting time at the pharmacy counter was 9 minutes (Table 3)**.**

Table 3
Distribution of Patients Based on Treatment Duration in under the PMJAY

Gap between registration and start of procedure (in days)	**Days**	**Frequency (N=200)**	**%**	**Mean (Days)**
	0	179	89.5	2.5
	1-10	14	7	
	11-20	1	0.5	

	21-30	1	0.5	
	31-40	2	1	
	40+	3	1.5	
Gap between receiving all lab reports and start of treatment (days)	1-2	66	33	1.5
	3-5	24	12	
	6-8	10	5	
	9-10	2	1	
Duration of treatment till date at AIIMS Rishikesh (days)	1-10	109	54.5	29
	11-20	42	21	
	21-30	13	6.5	
	31-40	3	1.5	
	41-50	5	2.5	
	50+	28	14	
Duration of hospitalization in AIIMS Rishikesh (in days)	1-10	150	75.0	8.3
	11-20	39	19.5	
	21-30	10	5.0	
	30+	1	0.5	
Duration of waiting to meet the doctor (minutes)	5-10	145	72.5	12.2* Mean time in minutes
	11-15	24	12	
	16-20	13	6.5	
	21-30	17	8.5	
	30+	1	0.5	
Waiting time at Pharmacy counter (minutes)	5-10	156	78	9* Mean time in minutes
	11-15	28	14	
	16-20	2	1	
	21-25	14	7	

Patient Satisfaction on the basis of Improvement in Patients' Health Condition and Medicine Received under the PMJAY

Almost all the patients (99.5%) informed that they received proper advice and precautions from doctors which improved their health conditions. More than half of the patients (59.5%) were taking the full course of medicines from the facility whereas some of the patients (40.5%) stated that they only got a partial course of medicines from the facility.

Quality of Treatment

A total of 61 per cent of the patients gave good feedback about the arrangements in the waiting hall, which include sitting arrangement, fan, drinking water facility, cleanliness. Majority (81.5%) of the patients was satisfied to a large extent with the behaviour of staff. Most of the patients were treated with courtesy and respect by the doctor (80%) and 72.5 per cent of the patients expressed satisfaction to a large extent with

the treatment. Almost all the patients (96.5%) recommended AIIMS, Rishikesh hospital for treatment under the PMJAY Scheme (Table 4).

Table 4
Patients' Feedback about the Selected Aspects of Quality of Treatment under the PMJAY

Type of feedback	Feedback	Frequency (N= 200)	%
Arrangements in waiting hall by patients	Very good	60	30.0
	Good	122	61.0
	Average	18	9.0
Patients satisfaction with behaviour Of Staff	To large extent	163	81.5
	To some extent	37	18.5
Treatment of patients with courtesy and respect	Yes	160	80.0
	To some extent	40	20.0
Patients satisfaction with the treatment	To large extent	145	72.5
	To some extent	55	27.5
Recommendation of treatment under PMJAY scheme from AIIMS, Rishikesh	Yes	193	96.5

Discussion

The present paper focuses on the functioning of the PMJAY in a tertiary care hospital i.e. AIIMS, Rishikesh, Uttarakhand. A recent report by the WHO highlighted the fact that almost 70 per cent of India's population spends most of their obtainable income on healthcare. Therefore, each year, about 40 million Indians are pushed into poverty because of out of pocket health spending.[14] In India, around 6 per cent do not seek health care due to financial reasons[15], and among those who do, experiences are often financially catastrophic and impoverishing. Household OOPE in India is 67 per cent of the total health expenditure.[16] PMJAY scheme should reduce OOPE during hospitalization and should prevent its consequences on equity among individuals, which should be the ultimate objective of any public health scheme. PMJAY offers a unique opportunity to improve the overall health of millions of Indians and to eliminate a significant cause of poverty due to CHE in the country. In Uttarakhand, the scheme like PMJAY includes not only Below Poverty Line (BPL) but each family with some conditions. The majority of the patients were aware of the process and procedure for enrolment in the scheme. Around half of the patients had monthly income of Rs. 5000-10000/- whereas some patients had nil income due to health issues and they had to leave their jobs resulting in huge debts. There was a significant decline in the employment status of both urban and rural patients in this study. A majority of the patients in the current study had knowledge of who should be included, how to be enrolled, what documents are required. For all the patients, Outpatient Department (OPD) registration and IPD admission charges for hospitalization in AIIMS, Rishikesh are Rs. 10/- and Rs. 25/- respectively. Once a patient is admitted under the scheme, all the expenditures i.e. investigations, medicines and nursing are free. So, poorer people who rely on daily incomes, tend to avoid hospitalization

owing to their loss of income. Medicines and tests which are not related or don't lead to hospitalization need to be paid by the beneficiary and this leads to an increase in their CHE. Therefore, outpatient care including diagnostics and provision of medicines needs to be insured for them even before hospitalization.[17] Cost of outpatient treatment (preferred over hospitalization) can contribute to over 65 per cent of OOPE[18, 19] but the same is not covered in the existing PMJAY nor it is proposed to be included. This is also a reason for a probable 23 per cent increase in outpatient costs in the households enrolled under RSBY.[10] Sometimes, few medicines were not available in the hospital pharmacy and in such a situation, patients had to purchase medicine from outside which resulted in an additional increase in their OOPE during the course of treatment. Usually, at the public hospitals, medicines are often not available and patients need to purchase leading to increase in out of the pocket expenditure[20-21]. In our study, more than half of the patients reported that they were provided a full course of medicine. But unfortunately, the cost of medicines and diagnostics in OPD are the major contributors to OOP (Out of the pocket).[17] The indirect expenditures on food, wage loss for patients and their attendants, transportation and stay in the hospital were also assessed. Though meals were provided free to patients, still patients had to spend money on certain food items like juices, fruits, etc. The transportation charges became expensive especially for those who came from a far distance. Because of diseases, not only the patient's but also the attendant's wage loss increased. About half of the patients' total expenditure exceeded more than five thousand rupees. It was found that the majority of patients' main source of expenditure was savings and few patients borrowed money either from friends or relatives. Some of the patients left their job and even stopped the schooling of their children, family food expenditure was also cut down, while few of the patients informed about postponing marriages and family events.

As per the findings of the present study, even the upper-income people in one-fourth of rural and about one-eighth in urban areas borrowed money to meet the hospital expenditure.[21, 22] The PMJAY scheme with an annual budget of Rs. 1200/- crore, even with full-scale implementation will have a marginal impact on reducing the OOPE. However, it can prevent CHE in India.[23] Although its impact on reducing the OOPE will be very limited as currently 60 per cent of the OOPE is incurred on outpatient care, which is not included under this scheme.[19] This scheme can probably be helpful for chronically ill patients from lower socioeconomic strata requiring frequent hospitalized care or expensive procedure such as dialysis. It also leaves a large section of the population uncovered, thus exposing them to the risk of CHE. Feedback from patients, about the behavior of staff and treatment received, was satisfactory. Good feedback was received about arrangements in a waiting hall, which includes sitting arrangement, fan, drinking water facility, and cleanliness**.** Almost all the patients were well informed about the improvement in health condition and received proper advice and precautions from the doctors. All the patients were satisfied with the treatment under PMJAY Scheme as they were treated with courtesy and respect by the doctors and other para-medics.

Limitation of the Study

The short duration of the study of two months (July-Aug 2019) may not have captured all the types of patients. So, findings cannot be generalized for all the possible categories of patients admitted in AIIMS, Rishikesh. Moreover, many of the inpatients had been on long follow-up and had been treated earlier as outpatients; it was not possible to categorize illness episodes as an outpatient.

Conclusion

The researchers found that almost three-fourth of the patients were satisfied with the treatment provided under the PMJAY scheme and >95 per cent of them also stated that they would recommend it to others. It also helped poor patients to reduce their out of pocket expenditure on treatment. Only the regular availability of medicines needs to be further improved.

Recommendations

As it was observed that the registration and discharge counters were crowded most of the time which wasted patients' time and also delayed the treatment procedure. ABY counters should be increased for providing better health facilities. The admission of the patients is a very cumbersome procedure and most of the patients get confused because of too much distance from OPD counter to the ward, labs, ICU, etc. Therefore, there should be adequate signage at all the strategic locations or some hospital staff must be deployed there to guide the patients and attendants. There is only one pharmacy counter under this scheme which always has a long queue. Hence, number of counters must be increased to cater to the patients load. Few of the patients' complained of cancellation of appointments after reaching the hospital; so, provision of prior cancellation via telephone or SMS should be there in case doctors are not present on the scheduled days of appointment.

References

1. Government of India. (2017). National Health Policy 2017. Ministry of Health and Family Welfare, Nirman Bhawan, New Delhi, p. 1-32.
2. WHO Health Financing for Universal Health Coverage. (Accessed on 4 December 2019). Available at https://www.who.int/health_financing/topics/financial-protection/out-of-pocket-payments/en/.
3. Mukherjee S, Haddad S & Narayana D. (1 Dec. 2011). Social class related inequalities in household health expenditure and economic burden: Evidence from Kerala, south India. International Journal for Equity in Health; 10(1): 1.
4. Berman P, Ahuja R & Bhandari L. (17 April 2010). The impoverishing effect of healthcare payments in India: New methodology and findings. Economic and Political Weekly; 65-71.
5. National Sample Survey Office, Ministry of Statistics and Programme Implementation, Press Release- KeyIndicators of Household Consumer Expenditure in India, 2011-'12. (2013). New Delhi, p. 5.
6. Karan A, Selvaraj S & Mahal A. (2014). Moving to universal coverage? Trends in the burden of out-of-pocket payments for health care across social groups in India, 1999–2000 to 2011–'12. PloS one, 9(8).
7. Universal Health Coverage. Available at https://www.who.int/news-room/fact-sheets/detail/universal-health-coverage-(uhc) (Accessed on 25 August-2019).
8. Health service provision in Odisha: Assessing facility capacity, costs of care, and patient perspectives. (2018). Institute for Health Metrics and Evaluation (IHME) and Public Health Foundation of India (PHFI). Seattle, WA.
9. Selvaraj S & Karan AK. (17 March 2018). Why publicly-financed health insurance schemes are ineffective in providing financial risk protection. Economic and Political Weekly; p. 60-8.

10. Karan A, Yip W & Mahal A. (2017). Extending health insurance to the poor in India: An impact evaluation of *Rashtriya Swasthya Bima Yojana* on out of pocket spending for healthcare. Soc Sci Med.; 181: 83–92.
11. Ranjan A, Dixit P, Mukhopadhyay I & Thiagarajan S. (December 2018). Effectiveness of government strategies for financial protection against costs of hospitalization care in India. BMC public health; 18(1): 501.
12. Ministry of Health and Family Welfare. (2017). National Health Policy 2017. Government of India, New Delhi.
13. Rasaily R & Mathur J.N. (October 2017). National ethical guidelines for biomedical research involving children; p. 23. Director General, ICMR, New Delhi
14. Mishra A. (14 Sept 2014). Trust and teamwork matter: Community health workers' experiences in integrated service delivery in India. Global Public Health; 9(8): 960-74.
15. Morbidity, health care and the condition of the aged. (March 2006). Report of National Sample Survey Organisation, Ministry of Statistics and Programme Implementation, Government of India; (507): 60.
16. National Health Accounts Estimates for India (2014-15). (2017). National Health Systems Resource Centre, Ministry of Health & Family Welfare, Government of India; New Delhi.
17. Malhi R, Goel D, Gambhir RS, Brar P, Behal D & Bhardwaj A. *Rashtriya Swasthya Bima Yojana* (RSBY) and outpatient coverage. (2020). J Family Med Prim Care; 9: 459-464.
18. Sharan M. RSBY in the context of universalizing healthcare in India. Available on: http://www.academia.edu/10735990 RSBY_in_the_context_of_universalizing_healthcare_in_India (Accessed on 27 August 2019).
19. Ravi S, Ahluwalia R & Bergkvist S. Health and morbidity in India (2004-2014). Available on https://www.brookings.edu/wp-content/uploads/2016/12/201612_health-and-morbidity.pdf. (Accessed on 31 August 2019).
20. Garg CC & Karan AK. Reducing out-of-pocket expenditures to reduce poverty: A disaggregated analysis at rural-urban and state level in India. (1 March 2009). Health policy and planning; 24(2): 116-128.
21. Alam M & Tyagi RP. (Oct. 2009). A study of out of pocket household expenditure on drugs and medical services. Population Research Centre, Institute of Economic Growth.
22. Jayakrishnan T, Jeeja MC, Kuniyil V & Paramasivam S. Increasing out-of-pocket health care expenditure in India-due to supply or demand. (2016). Pharmacoeconomics; 1(105): 1-6.
23. Lahariya C. (1 June 2018). AyushmanBharat'program and universal health coverage in India. Indian paediatrics; 55(6): 495-506.

स्वास्थ्य एवं जनसंख्या :
परिप्रेक्ष्य एवं मुद्दे, 44 (2): 73-84/ अप्रैल–जून 2021

उत्तराखंड स्थित तृतीयक चिकित्सा अस्पताल में प्रधानमंत्री आरोग्य योजना के बारे में रोगियों के दृष्टिकोण एवं उपचार

*निशु झा, **वी.के. तिवारी, *** योगेश बहुरूपी, **** डी समीर मोहन अग्रवाल,
*****मनीषा धिनवा, ******पूर्वी कुलश्रेष्ठ, *******रवि कांत और ********अजित सिंह भदौरिया

* एएमपीएच छात्र, ई–मेलः nishuesic@gmail-com;*** सहायक प्रोफेसर; सामुदायिक एवं परिवार चिकित्सा विभाग;
****सीनियर रेजिडेंट, एनेस्थिसियोलॉजी विभाग, *****–सह–प्रोफेसर, फिजियोलॉजी विभाग;******–निदेशक और
*******सीईओ;अखिल भारतीय आयुर्विज्ञान संस्थान, ऋषिकेश–249203, उत्तराखंड (भारत)।
**डीन ऑफ स्टडीज, प्रोफेसर और प्रमुख, योजना और मूल्यांकन विभाग, राष्ट्रीय स्वास्थ्य एवं परिवार कल्याण संस्थान, मुनिरका, नई दिल्ली –110067।

एसोसिएट एडिटर:
प्रो. रमीला बिष्ट, जवाहरलाल नेहरू विश्वविद्यालय, नई दिल्ली।

समीक्षक:
डॉ. तपस रंजन बेहरा, सामुदायिक चिकित्सा विभाग, एससीबी मेडिकल कॉलेज, कटक, ओडिशा।
डॉ. बालकृष्णन नायर, पब्लिक हेल्थ रिसर्चर, ऑकलैंड यूनिवर्सिटी ऑफ टेक्नोलॉजी, न्यूजीलैंड।

सारांश

उत्तराखंड स्थित तृतीयक चिकित्सा अस्पताल में प्रधानमंत्री आरोग्य योजना के बारे में रोगियों के दृष्टिकोण एवं उपचार के खर्च का आकलन करने हेतु एम्स,ऋषिकेश द्वारा 01 जुलाई से 31 अगस्त 2019 के दौरान क्रॉस सेक्शनल डिज़ाइन के साथ एक विवरणात्मक अध्ययन किया गया। सामाजिक जनसांख्यिकी विशेषताओं, पीएम–जेएवाई के बारे में ज्ञान/जागरूकता, भारतीय आयुर्विज्ञान संस्थान, ऋषिकेश में होने वाले व्यय, स्वास्थ्य संबंधी व्यवहार, समस्याओं का सामना करने तथा रोगियों द्वारा दिए गए सुझावों का डेटा संग्रह करने हेतु एक पूर्व–निर्मित अर्ध–संरचित प्रश्नावली का उपयोग किया गया था। अध्ययन में एम्स, ऋषिकेश से इलाज करने वाले रोग से पीड़ित रोगी तथा पीएम जेएवाई के कार्यक्रम कार्यान्वयनकर्ता शामिल थे। योजना के अंतर्गत पंजीकरण के चरण से लेकर डिस्चार्ज होने तक कुल 200 मरीजों का साक्षात्कार लिया गया। अध्ययन में पाया गया कि 23 सितंबर 2018 को शुरू किया गया पीएम जेएवाई उचित निष्पादन के साथ सफलतापूर्वक चल रहा है। रोगी और परिचारक की औसत वेतन हानि क्रमशः रु 4283 तथा रु 3033 है। सभी लैब रिपोर्ट प्राप्त करने और उपचार शुरू करने के बीच की औसत अवधि 1.5 दिन थी। डॉक्टर से मिलने हेतु औसत प्रतीक्षा समय 12.2 मिनट था। फार्मेसी काउंटर पर औसत प्रतीक्षा समय 9 मिनट था। पीएमजेएवाई के अंतर्गत दिए गए उपचार से लगभग सभी रोगी संतुष्ट थे।

प्रमुख शब्द: आयुष्मान भारत, भारत, सार्वभौमिक स्वास्थ्य कवरेज, आय से अधिक व्यय, वर्णनात्मक अध्ययन, औसत वेतन हानि।

Health and Population:
Perspectives and Issues, 43 (2) :85- 90 / April-June 2020

Contraceptive Practice among Frontline Grass-root Level Health Workers in an Urban Setting

***Binod Kumar Behera, **Vikas Bhatia, ***Swayam Pragyan Parida, ****Prajna Paramita Giri and *****Manish Taywade**

*Asso. Professor, E-mail: cmfm_binodb@aiimsbhubaneswar.edu.in;
**Professor; ***Asst. Professor;
Department of Community Medicine and Family Medicine, AIIMS Bhubaneswar, Odisha-751019.

Asso. Editor
Prof. Gajanan D Velhal, Prof. and Head, Deptt of Community Medicine, Seth GS Medical College and KEM Hospital, Mumbai.

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Dr. Rupali Sabale, Asst. Prof, Community Medicine, GSMC & KEMH, Mumbai.

Abstract

Population explosion is one of the major challenges the developing countries have been facing. India is the first country to start a nationwide family planning programme to control the population which was later named and aimed for overall family welfare. Contraception has been a taboo in the Indian society leading to a high unmet need for modern contraceptives. The present study was conducted in an urban setting of Odisha, one of the eastern states of India. It was found that more than 40 per cent of the currently married grass-root level health care worker's families have never used any contraceptive method. One-fifth of the currently married health worker adopted the female sterilization method as the terminal method of choice.

Key words: Contraceptive practice, Grass-root health workers, Family welfare, Sterilisation.

Introduction

Population explosion is the biggest challenge for the development of many countries like India. A huge population leads to a huge demand and pressure on all available resources like food, water, and all public services like health care, etc. With more than 135 crore people, India is the second-most populous country after China[1]. In developing countries, 214 million women of reproductive age have an unmet need for a modern contraceptive method[2]. Although India is the first country to start a national population control programme, contraception has been a matter of taboo in the Indian society; and there is a high unmet need for contraception among the Indian married females[3,4].

The Government of India was committed to increase the modern contraceptive use from 47.7 per cent to 54.3 per cent among the married women aged 15-49 years by 2020[5]. Modern contraceptive use by the currently married women has even decreased in the recent years as per the NFHS-4 report in comparison to NFHS-3.The unmet need for contraception has seen a minimal improvement despite the provision of

quality modern methods of contraception free of cost in the family welfare programme. The utilization of the modern family planning services in India is skewed towards sterilization, particularly sterilization of women; female sterilization accounts for 37.3 per cent of the modern method of contraceptive use. In other words, 75 per cent of the married women prefer or adopt the sterilization method of choice[4]. In the recent years, there is a report of high sterilization regret among the Indian women who adopted the same[6].

The above fact creates a curiosity regarding provider bias towards female sterilization. In India, most of the health services like maternal health services, child health services, nutrition, vaccination including family planning services are being provided by Multipurpose Health workers (female) and Accredited Social Health Activists (ASHAs) at the primary care level besides being the key communication mechanism between the healthcare system and rural populations[7,8]. The knowledge, practice, and preference of these workers have a vital impact on the implementation of national programmes like the family planning programmes. With this background in mind, the present study was conducted to assess the family planning practices of grass root level health care workers in an urban area of Odisha.

Methodology

This cross-sectional study was conducted in Bhubaneswar, the capital city of Odisha, which is one of the key urban centers of India. The Bhubaneswar Municipal Corporation (BMC) has an area of 135 square kilometers (2012) with a population of 885363. BMC has a population density of 6228.4 people per sq. km and 19 per cent of the population resides in slum areas. Bhubaneswar has three government tertiary hospitals, two Urban Community Health Centers (UCHCs), 16 Urban Primary Health Centers (UPHCs), three Dispensaries[9], 102 Integrated Child Development Scheme Services (ICDS) Anganwadi centers. There are 89 MPHW F and 158 ASHA workers. The present study was carried out in the BMC area during October 2018 to October 2019.

Study Subjects and Sample Size: All the grass-root level health workers i.e. MPHW-F and ASHAs in the BMC area were included for the study purpose. Inclusion criteria: MPHW-F and ASHAs were contacted at their respective UPHCs on an intimated date for the study purpose. Exclusion criteria: Those health workers found absent on subsequent three visits and those who did not give consent were excluded.

Data Collection and Ethical Clearance: Data were collected using a semi-structured interview schedule. The present study received ethical clearance from the institute ethics committee of AIIMS, Bhubaneswar vide letter number T/IM-F/17-18/14 dated 12 October 2017. The data so collected were coded to conceal the identity before entry in the excel sheet. The data were double entered in the excel sheet and compared to check for any error.

Findings

In Bhubaneswar urban area, a total of 257 grass-root level health care workers are working out of which 221 health workers could be included in this study after obtaining their informed consent. Eight health workers did not give consent for the study and the rest 28 health workers could not be contacted during the data collection period at their working area due to their involvement in other assignments. The participants' mean age was 38.4±8.3 years other socio-demographic details of the recruited health workers are shown in Table 1.

Table 1

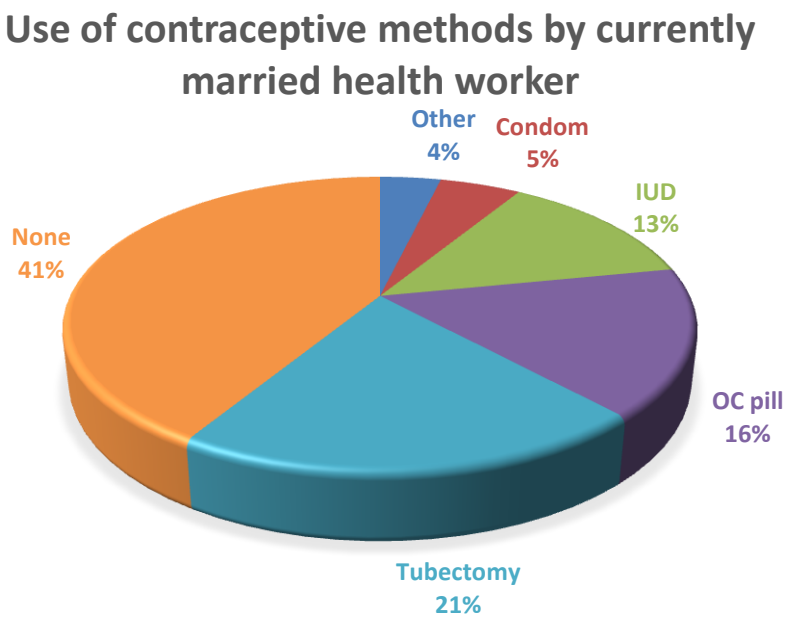
Socio-demographic Profile of the Grass-root Level Health Workers of Bhubaneswar Municipality Area

Variable	Number of health worker	Percentage
Occupation		
ASHA	146	66.1
MPHW F	75	33.9
Caste		
General	113	51.1
SC	56	25.3
OBC	43	19.5
ST	9	4.1
Marital status		
Married	197	89.1
Unmarried	24	10.9
Type of family		
Nuclear	158	71.5
Joint	63	28.5
Educational Qualification		
10+2	62	28.1
Graduate	55	24.9
Matriculate	53	24.0
Middle	45	20.4
Higher	6	2.7
Socioeconomic status		
Upper lower	103	46.6
Lower middle	66	29.9
Upper middle	52	23.5
Total	**221**	**100**

Out of the 221 study participants, 197 were ever married females and 33 had more than two children. Out of the 197 ever married health workers, 160 of them were eligible couples and the pattern of contraceptive usages was almost similar to the ever-married health workers' families.

More than 40 per cent of the currently married grass-root level health care worker families had never used any contraceptive method. Out of the 197 ever married grass-root level health care workers, 41 (20.8%) had adopted the terminal tubectomy method of contraception and none of the families had accepted the male terminal contraception i.e. vasectomy. Adoption of tubectomy was found to have no association with the educational qualification of the female or type and socioeconomic status of the family. Before adopting the terminal method of contraception, most of them had tried other forms of contraceptive methods including oral contraceptive pills and intra-uterine device (IUD). Only 8 (4%) families opted to use a condom as one of the contraceptives.

Figure 1
Use of Modern Contraceptive Method among the Ever and Currently Married Grass-root Level Health Workers



Discussion

India was the first country in the world to have launched a National Programme for Family Planning in 1952. Over the decades, the programme has transformed in terms of policy and actual programme implementation. The programme has been renamed and aimed at for not only achieving the population stabilization goals but also promotes reproductive health and reduce maternal, infant and child mortality, and morbidity[10]. Reduction in maternal, infant, and child mortality and morbidity is directly or indirectly related to the reproductive health of the mother. Better reproductive life and population stabilization both can be achieved by avoiding unwanted pregnancies by adopting appropriate modern contraceptive methods available through the programme.

Most of the study participants had good knowledge of all types of contraceptives available for the beneficiaries in the health system. In the present study, the percentage of contraceptive utilization among the study participants was slightly lower (58.75%) than the state average of 61.3 per cent, as per the NFHS-4 report statistics. The utilization and acceptance of IUD among the health care workers was far more (13.1%) than among the general public (1.3%). The reason for the same might be a high level of awareness about the method. Female sterilization was adopted by more than one-fifth of the eligible females which is slightly lower than the state average of 25.9 per cent[11]. It was even surprising that the female health care workers could not convince their family members for adopting vasectomy which is safer and easier than tubectomy[12]. Families adopted tubectomy only as the terminal method of contraception; the reasons for the same could not be explored in this study. An explorative qualitative study might bring out the reasons. Use of conventional contraceptives too found less than the state average of 7.9 per cent as reported in the NFHS-4 fact sheet.

Conclusion

Although the grass-root level female health workers knew about all the forms of contraceptive methods and were aware of the availability of the same in the health system, they failed to adopt them in the desired manner. There is some inherent bias towards female sterilization; hence, they might be promoting the same, as there is an incentive available for promoting and making the same available to the client. To achieve the goal of population stabilization and to reduce India's overall fertility rate to 2.1 by the year 2025, more strategic approach by the grass-root level health workers is required besides adopting the same by themselves.

References

1. World population prospects. Population Division, United Nations [Internet]. [cited on 13 April 2020]. Available on https://population.un.org/wpp/Download/Standard/Population/
2. Family planning/Contraception [Internet]. [cited on 13 April 2020]. Available on: https://www.who.int/news-room/fact-sheets/detail/family-planning-contraception.
3. The status of family planning in India [Internet]. [cited 2020 Dec 16]. Available on: https://www.fhi360.org/sites/default/files/media/documents/india1-family-planning-status.pdf.
4. NFHS-4.pdf [Internet]. [cited on 16 Dec 2020]. Available on: http://rchiips.org/nfhs/pdf/NFHS4/India.pdf.
5. Mozumdar A, Tobey E, Aruldas K, Acharya R & Jain A. (2020). Contraceptive use dynamics in India: A prospective cohort study of modern reversible contraceptive users [Internet]. Population Council; [cited on 18 July 2020]. Available on: https://knowledgecommons.popcouncil.org/departments_sbsr-rh/1059/.
6. Sterilization regret among married women in India: Implications for the Indian National Family Planning Programme. (2013). Guttmacher Institute. [cited on 15 Apr 2020]. Available on: https://www.guttmacher.org/journals/ipsrh/2012/12/sterilization-regret-among-married-women-india-implications-indian-national.
7. About ASHA. (2009). [cited on 17 July 2019]. Available on: https://web.archive.org/web/20090422204352/http://mohfw.nic.in/NRHM/asha.htm.
8. National Health Mission. [cited on 7 July 2018]. Available on: http://www.nrhmorissa.gov.in/frmNcd.aspx.
9. Hospitals: Welcome to Khordha District Web Portal. [cited on 17 June 2020]. Available on: https://khordha.nic.in/public-utility-category/hospitals/page/2/.
10. Family Planning: National Health Mission. [cited on 13 Apr 2020]. Available on: https://nhm.gov.in/index1.php?lang=1&level=2&sublinkid=821&lid=222.
11. OR_FactSheet.pdf. [cited on 12 Feb 2021]. Available on: http://rchiips.org/nfhs/pdf/NFHS4/OR_FactSheet.pdf.
12. Vasectomy vs Tubal ligation. (2018). Marie Stopes Vasectomy. [cited on 28 Dec 2020]. Available on: https://www.vasectomy.org.au/faqs/vasectomy-vs-tubal-ligation.

स्वास्थ्य एवं जनसंख्या :
परिप्रेक्ष्य एवं मुद्दे, 43 (2): 85–90 अप्रैल–जून 2021

शहरी विन्यास में ज़मीनी स्तर के अग्रिम पंक्ति स्वास्थ्य कार्यकर्ताओं के बीच गर्भनिरोधक अभ्यास

*बिनोद कुमार बेहरा, **विकास भाटिया, ***स्वयं प्रज्ञां परिदा,
****प्रज्ना परमिता गिरि एवं *****डमनीश तायवाड़े

*सह प्रोफेसर, ई– मेलः cmfm_binodb@aiimsbhubaneswar.edu.in;
**प्रोफेसर; ***सहायक प्रोफेसर;
सामुदायिक चिकित्सा और परिवार चिकित्सा विभाग, एम्स भुवनेश्वर, ओडिशा–751019।

सारांश

जनसंख्या विस्फोट विकासशील देशों की प्रमुख चुनौतियों में से एक है। भारत जनसंख्या को नियंत्रित करने के लिए राष्ट्रव्यापी परिवार नियोजन कार्यक्रम शुरू करने वाला पहला देश है जिसे बाद में चिन्हित किया गया और इसका उद्देश्य समग्र परिवार कल्याण था। गर्भनिरोधक का प्रयोग भारतीय समाज में एक वर्जित विषय रहा है जिसके कारण आधुनिक गर्भ निरोधकों की अत्यधिक आवश्यकता है। वर्तमान अध्ययन भारत के पूर्वी राज्यों में से एकए उड़ीसा की एक शहरी विन्यास में आयोजित किया गया था। यह पाया गया कि वर्तमान में विवाहित, जमीनी स्तर के स्वास्थ्य देखभाल कार्यकर्ता के परिवारों में से 40 प्रतिशत से अधिक ने कभी भी गर्भनिरोधक विधि का उपयोग नहीं किया है। वर्तमान में विवाहित स्वास्थ्य कर्मियों में पांच में से एक ने महिला नसबंदी पद्धति को अपनाया।

मुख्य शब्दः गर्भनिरोधक अभ्यास, बुनियादी स्वास्थ्य कार्यकर्ता, परिवार कल्याण, नसबंदी ।

Health and Population:
Perspectives and Issues, 43 (2) 91-102 / April-June 2020

Determinants of Age at Natural Menopause among Women of Uttarkashi

***Maninder Kaur, **Mehakpreet Kaur and ***Monika Thakur**

*Assistant Professor, E-mail: maninderkaur_1@yahoo.in; **Research Scholar, E-mail: mehakpreet1007@gmail.com;
Department of Anthropology, Panjab University, Chandigarh, India-160014.
***Senior Project Scientist, Indian Institute of Technology, Kanpur, E mail: monikathakur16@gmail.com.

Asso. Editor:
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Reviewers:
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Dr. Monika Saini, Asst. Professor, Department of Social Sciences, NIHFW, New Delhi.

Abstract

The present study attempts to evaluate the determinants of age at menopause among women of Uttarkashi district of Uttarkhand, a northern state of India. Data on forty-three post-menopausal women were gathered using a questionnaire consisted of information regarding age at menopause, duration of breast-feeding, parity, number of abortions, use of oral contraceptive and socio-economic characteristics. The mean age at menopause of women was 48.43 years. Univariate regression analysis revealed significantly higher age at menopause among women who had age ≥ 48years, longer reproductive span, non-user of oral contraceptive. The mean age at menopause was found to occur early among women who had parity less than 4, vegetarian diet, lower BMI and higher educational attainment. The study identified use of oral contraceptive, educational status, occupation, duration of breast-feeding and diet as the important determinants of timing of onset of menopause.

Key words: Post-menopause, Menopause age, Reproductive span, Oral contraceptives.

Introduction

Menopause is a universal and critical phase in women's midlife when the capacity to reproduce terminates. It is characterized by the depletion of the ovarian follicles which is responsible for cessation of steroid and peptide hormones from the ovaries[1]. An array of physiological changes takes place in the female's body, some of these are the result of cessation of ovarian function and related menopausal episodes while others are an outcome of the ageing process[2]. A study conducted by Thurston et al.[3] mentioned that this phase encompasses significant changes in body composition, cardio-metabolic health, mood, sleeping pattern, cognition and overall performance of the body.

Age at menopause is influenced by behavioural, reproductive, social, and demographic factors[4,5], probably intertwined with genetic factors[6,7]. Many studies[8-10] have shown that the timing of menopause varies among and within populations; and ranges between 40 years and 55 years all over the world. Regional variability in different parts of India with respect to menopausal age as evaluated by Ahuja[11] was found to be 45.1 ± 4.1 years in the eastern part, 45.5 ± 3.8 in the western part, 45 ± 3.6 in the northern part, 44.7 ± 3.3 years in the southern and 43.1 ± 4.8 years in central India. Various earlier reports[12,13] observed that women in India

had an earlier onset of menopause which affect their health at an early age than their counterparts in the industrialized world[14]. Findings of Nicks et al.[15] presented that irregularities in hormonal serum levels during perimenopausal period may be responsible for silent morphological and physiological changes in the body before the time of onset of menopause.

Earlier literature underscored the potential influence of various factors for the earlier or later onset of menopause and these factors varies among women throughout the world. Reports of Ley et al.[16] revealed that body mass index (BMI) was slightly greater in postmenopausal women than in premenopausal women. Observations of Birkhauser et al.[17] illustrated that an earlier onset of menopause is one of the causes for enhancing morbidity as well as mortality rates and also directly preceding a heightened risk for cardiovascular problems and osteoporosis among women. Many previous epidemiological studies concerning timing of menopause witnessed that few years of education is associated with early menopause[18,19], while findings of Baird[20] noted that early age at menopause was linked with the vegetarian diet.

Objective

Early or late onset of age at menopause is found to be correlated with various negative health consequences. So, identifying various determinants which are associated with the timing of menopause became very essential for improving the health and quality of life of postmenopausal women. Hence, the major objectives of the present study are to:

i) determine timing of onset of menopause and
ii) predict determinants related to early or late menopause among women of Uttarkashi district, Uttarakhand of north India.

Methodology

The present cross-sectional study samples consisted of 43 postmenopausal women of Uttarkashi district of Uttarakhand, north India. The sample was selected through a purposive sampling method. The field work was conducted from 24 October 2017 to 3 November 2017. The data were collected from four different villages i.e.Thalan, Mangalpur, Sara and Tiloth of Uttarkashi district, Uttarakhand. Data collection involved personal interviews based on the structured questionnaires, anthropometric measurements and physiological parameters. The structured questionnaire was employed to gather information on the personal details of the participants such as the name, age, religion, occupation, educational status, use of oral contraceptive, age at marriage, number of children, duration of breast feeding and the number of abortions, etc. Kaplan-Meier cumulative survivorship was employed to estimate mean age at menopause. Anthropometric measurements i.e. height (cm) and weight (kg) and physiological parameters (systolic blood pressure and diastolic blood pressure) of each subject were measured following the standard techniques given by Weiner and Lourie[21]. The instruments were checked for zero error and the procedure for taking the measurement was practiced beforehand to reduce the personal errors. Body mass index was calculated and classified into three categories i.e. underweight (<18.50 kg/m^2), normal (18.50 - 24.99 kg/m^2) and overweight /obese (≥25 kg/m^2) following WHO [22] classification of body mass index.

The data so collected were statistically analysed performing SPSS (statistical package for social sciences, version 20.0) computer software (SPSS, Inc., Chicago, IL, USA). The data and responses obtained were coded and tabulated. The descriptive statistics included mean, median, SD, and percentage and the

inferential statistics involved ANOVA and Chi-square test. Univariate cox proportional hazards regression model was used to identify the determinants of age at menopause.

Findings

Socio-demographic, reproductive and anthropometric variables of rural postmenopausal women of Uttarkashi are summarized in Table 1. The mean age of the postmenopausal women in the present study was 51.34±3.2 years. Kaplan-Meier cumulative survivorship estimated the mean age at menopause as 48.43±4.1 years. The mean age at marriage was calculated to be 19.0±2.2 years. The parity was found to be 3.28±1.1 among the postmenopausal women. Out of the total 43 postmenopausal women, 42 (97.7%) never used oral contraceptive and only 1 woman (2.3%) had used oral contraceptive.

About 67.4 per cent of the women had one or more abortions in their reproductive life span; and 32.6 per cent of the participants experienced no abortion at all. Out of the total samples, 62.8 per cent of women were housewives, while 34.9 per cent and 2.3 per cent were engaged in farming as well as government/ private services respectively. Educational level indicated that 60.5 per cent of women was illiterate, while 30.2 per cent studied up to matric and 9.3 per cent were graduates. About 81.4 per cent women was married, whereas 18.6 per cent of women was widow, this may be attributed to the higher mortality rate in the field area as experienced during the data collection. Majority of the women (74.4%) was vegetarian, while 25.6 per cent was non-vegetarian. The data analysis revealed that the total duration of breast feeding was three or more than three years among majority of the women (60.4%), while 14 per cent and 25.6 per cent of the women had one year and two years of breast feeding respectively.

Table 1
Socio-demographic, Reproductive and Anthropometric Variables
of Rural Postmenopausal Women of Uttarkashi

Socio-demographic, reproductive and anthropometric variables	**Postmenopausal women (N=43)**
Age (years)	51.34±3.2
Mean age at Menopause (years)	48.43±4.1
Age at marriage (years)	19.0±2.2
Parity	3.28±1.1
Contraceptive ever used N (%) Yes No	 1 (2.3%) 42 (97.7%)
Abortion No One or more than one	 14 (32.6%) 29 (67.4%)
Occupation Service (Govt./private) Housewife Farming	 1 (2.3%) 27 (62.8%) 15 (34.9%)
Educational level Illiterate Matric	26 (60.5%) 13 (30.2%) 4 (9.3%)

Graduate	
Marital status Married Widow	 35 (81.4%) 8 (18.6%)
Diet Vegetarian Non-vegetarian	 32 (74.4%) 11 (25.6%)
Breastfeeding duration (Years) One year Two years Three years or more	 6 (14%) 11 (25.6%) 26 (60.4%)

Univariate cox proportional hazard model was employed to view the determinants of timing of age at menopause among the rural postmenopausal women of Uttarkashi (Table 2).

Table 2
Univariate cox proportional hazard Model Relating Age at Natural Menopause to Various Variables among Rural Postmenopausal Women of Uttarkashi

Variables	**Postmenopausal women N (%)**	**Mean age (years)**	**Hazard Ratio[a] (95%CI)**	**p for trend**
Age Below 48 Above 48	 11 32	 42.36 50.51	 1 1.2(0.50-1.98)	1.00
Age at marriage Below 18 Above 18	 12 31	 46.83 49.04	 1 1.0 (0.4-2.3) .3	.66
Educational level [b] Illiterate Literate	 26 (60.5%) 17 (39.5 %)	 50.48 49.70	 1 1.9(0.8-4.8)	.03*
Parity 1-3 ≥ 4	 25 (58.1%) 18 (41.8%)	 47.4 49.7	 1 1.2(.5-3.0) .3	0.3
Contraceptive ever use N[b] Yes No	 1 (2.3%) 42 (97.7%)	 37 49.84	 1 1.0(0.13-7.26)	.000***
Abortion[b] No More than 1	 14 (32.6%) 29 (67.4%)	 47.92 48.67	 1.2(.5-1.89) 1	.62
Occupation[b] Working Housewife Farming	 1 (2.3%) 27 (62.8%) 15 (34.9%)	 50.0 49.01 47.26	 1 1(.13-7.57) 1(.53-1.88)	.03*
Marital status[b] Married Widow	 35 (81.4%) 8 (18.6%)	 47.9 50.6	 1.0(.3-3.2)	.09

Diet[b]				
Vegetarian	32 (74.4%)	49.24	1	.04*
Non-vegetarian	11 (25.6%)	51.28	4.1(1.2-14.1)	
Breastfeeding duration (Months) [b]				
1 (1-12 months)	6 (14%)	46.5	1	
2 (12-24 months)	11 (25.6%)	49.9	1.2(.29-3.45)	.03*
3 (24-36 months)	21 (48.8%)	47.6	1.0(.35-2.83)	
4 (36 months & above)	5 (11.6%)	50.8	1.1(.37-2.65)	
Body mass index [b] (kg/m^2)				
Underweight	1 (2.3%)	47.96	1	.52
Normal	25 (58.1%)	49.00	1.2(.13-7.51)	
Overweight and obese	17 (39.6%)	49.00	1.1(.54-1.85)	
Systolic blood pressure (mm of Hg)				
Normal SBP	39	48.52	1	.27
High SBP	4	47.50	1.3(.35-2.79)	
Diastolic blood pressure (mm of Hg)				
Normal DBP	33	48.36	1	.35
High DBP	10	48.65	1.2(.49-2.02)	

It is evident from Table 2 that women above 48 years of age had 1.2 times (95% CI 0.5-1.98) higher probability of attaining menopause at an early age (42.36 years) as compared to their counterparts above 48 years of age (50.51years). Women who married early (age at marriage was below 18 years) had experienced early menopause (46.83years) than women who married at the age of above 18 years (49.04 years). The menopausal age of the illiterate women was higher (50.48 years) than literate women (49.70 years). The mean age of women who never used contraceptives was higher (49.84 years) than the one who used the contraceptives (37 years). The women with 1-3 children had an early mean age at menopause (47.4 years) and those with children ≥4 had late mean age at menopause (49.7years). About 67.4 per cent of the women had one or more abortion in life; and thus, had a late menopause (48.67 years) and 32.6 per cent of them had no abortion, had a lower mean age at menopause (47.92 years); though the difference was not statistically significant. Working women showed late age at menopause (50.0 years) as compared to the housewives (49.01 years) and women engaged in farming (47.26 years). Marital status with respect to attaining age at menopause was nonsignificant for married (47.9 years) and widow (50.6 years) women. Women who drank milk had a late mean age at menopause (51.69 years) than who never drank milk (50.2 years). Vegetarian women experienced an early age at menopause (49.24 years) than their non-vegetarian counterparts (51.28 years). Women with the highest duration of breast feeding had late age at menopause i.e. 50.8 years as compared to their counterparts with lesser duration of breast feeding. Women having lower mean value for body mass index (BMI) attained early age at menopause (47.96 years) than those with normal (49 years) and overweight (49 years) categories of body mass index. The higher systolic blood pressure was associated with early age at menopause (47.50 years) and women with normal systolic blood pressure had a late age at menopause (48.52 years). The higher diastolic blood pressure was associated with slightly late age at menopause among women (48.65 years) as compared to women with normal diastolic blood pressure (48.36 years).

Discussion

In the present study, Kaplan-Meier cumulative survivorship estimated the mean age at menopause as 48.43±4.1 years among the rural women of Uttarkashi. Comparison of rural women of present study with various international studies revealed their earlier age at menopause as compared to Malaysian women[23], European women[24], North American women, Latin American women[24], Asian women[24], Australian women[25] and Taiwan women[26] (Table 3).

Table 3
Comparison of Mean and Median Ages at Natural Menopause among Different Populations

Population	Mean age at menopause	Median age at menopause	Reference
International studies			
Australia	50.4 years	-	Walsh[25]
Thailand	50.3 years	-	Tungphaisal et al.[49]
Taiwan	49.5 years	-	Chow et al. [26]
Chile	-	50.0 years	Morabia et al.[50]
China	-	49.0 years	Morabia et al.[50]
Colombia	-	50.0 years	Morabia et al.[50]
USA	-	51.3 years	Kato et al. [51]
Turkey	47.3 years	-	Carda et al. [27]
Kuching, Sarawak, Malaysia	51.3 years	-	Rahman et al. [23]
Asia	-	51.1 years	Palacios et al. [24]
Europe	-	54 years	Palacios et al.[24]
North America	51.4 years	50.5 years	Palacios et al.[24]
Latin America	-	48.6 years	Palacios et al. [24]
National studies			
Amritsar, Punjab	47.54 years	-	Sidhu et al. [31]
Haridwar district, Uttarakhand	45.02±4.35 years	-	Kapur et al. [32]
West Bengal: Rural Urban	 53.9±4.37 years 51.39±4.6 years	 - -	Dasgupta & Ray[52]
Tamil Nadu	44.49 years	44 years	Dutta et al.[33]
Shimla, Himachal Pradesh	44.54 years	-	Mahajan et al.[8]
India: East West North South Central	47.3±3.91 years 46.2±4.89 years 45.5±4.86 years 46.1±5.63 years 47.8±4.41 years	- - - - -	Ahuja[11]
Nagaland	48.3±7.6 years	49 years	Rülu et al.[53]
Odisha	44.82 years	45 years	Satpathy[34]
Kanpur	47.27±2.44 years	47.5±2.45 years	Thakur et al.[35]
Uttarkashi population	48.43±4.1 years	-	Present study

The women in the present study had a late age at menopause as compared to their counterparts from Turkey[27]. On reviewing literature on this aspect, it has been observed that women living in the developing countries experience menopause several years earlier than those in developed countries[28-30]. To evaluate the regional variation in age at menopause, sample females of the present study have been compared with the pre-existing data on some of the Indian populations. Women from Uttarkashi had later mean age at menopause as compared to women from Amritsar[31], Haridwar[32], Tamil Nadu[33], Shimla[8], Odisha[34], Kanpur[35]. Hence, the findings of present study highlighted that the age at menopause has been highly variable among different regions of the world and within populations. These geographic and international variations in the timing of menopause may be due to varying methodological approaches used for ascertaining the age at natural menopause as well as various endogenous and exogenous factors (socio-economic, rural-urban setting or lifestyle differences).

A wide spectrum of studies concerning menopause were cross-sectional, rather than longitudinal in design; thereby enhancing the probability for misreporting of the true picture of the timing of natural menopause, particularly for understanding the various factors predicting the timing of menopause. Results of univariate cox proportional hazard model revealed that women aged above 48 years of age have 1.2 times (95% CI 0.50-1.98) higher probability of attaining late age at menopause as compared to their counterparts with below 48 years of age. Women who married early i.e. age at marriage was below 18 years had early age at menopause (46.83 years) than women who married at age above 18 years (49.04 years). Age at menopause was earlier for married women as compared to women who were widows though the difference was found to be statistically nonsignificant. Findings of Ahuja[11] also reported a similar positive correlation ($P < 0.001$) between marital status and menopausal age.

In the present study, vegetarian women experienced an early age at menopause (49.24 years) than their non-vegetarian counterparts (51.28 years). Findings of the present study are in accordance with the reports of Baird[20] showing early age at menopause among vegetarian women. In this current cross-sectional study, menopausal age of the illiterate women was higher (50.48 years) than the literate women (49.70 years). Contrasting reports have been noted by many earlier studies[35-37] showing women with a lower level of education attained menopause at early ages than women with higher levels of education.

Mean age of onset of menopause among women who never used contraceptives was higher (48.70 years) than those who used the contraceptives (37 years). The reports of Bromberger et al.[38] analysed that users of oral contraceptives had a significantly early natural menopause than nonusers. Contrasting results were found by Thakur et al.[35] and Henriquez et al.[39] where use of oral contraceptives were associated with late age at natural menopause. It can be inferred that effect of oral contraceptive use may influence the age at menopause whereas there is an equal possibility that some other confounding factors are responsible to accelerate the onset of menopause[38].

Women in the present study revealed an early age at menopause (47.96 years) with lower mean value of body mass index (BMI) than those with normal (49 years) and overweight (49 years) categories of body mass index. Similar findings have been demonstrated in many earlier studies showing positive association of higher BMI with late onset of menopause[36,37,40].

The women with lower parity (1-3 children) had an early mean age at menopause (47.4 years) as compared to their counterparts with higher parity (49.7years). Similar findings were recorded among the Chinese women where the median menopausal age was observed to increase with parity ($p<0.001$): 49.3

years; 50.0 years and 50.2 years for women with 0, 1 or ≥2 children respectively[36]. A study by Zamaniyan et al.[41] also recorded that the number of pregnancies were significantly associated with late onset of menopause. An inverse correlation was observed in the study carried out by Ahuja[11] between the number of children and the age at menopause (P_{trend} = 0.038).

In the current cross-sectional study, higher systolic blood pressure was associated with early age at menopause (47.50 years) and women with normal systolic blood pressure had a late age at menopause 48.52 years. An opposite trend was witnessed for diastolic blood pressure indicating slightly early age at menopause among women with normal diastolic blood pressure (48.36 years). Previous literature[42,43] illustrated that menopause associated with imbalance of hormone levels, oral contraceptives, and endocrine therapy has been reported as risk factors for hypertension in women.

In this study, working women showed late age at menopause (50.5 years) as compared to housewives (49.3 years) and women engaged in farming (46.6 years). Findings of Gold et al.[44] also in accordance with the findings of the present study depicting not being employed was associated with early natural menopause. A substantial proportion of researches[45,46] also indicated that lower educational attainment and/or socio-economic status, often determined by occupational status of the woman or her husband was directly associated with early age at menopause.

About 67.4 per cent of women who had one or more abortions in life had a late age at menopause (48.67 years) than women who had no abortion (47.92 years) though the difference was not statistically significant. Since the onset of menopause is theorized to be related to the rate of loss of oocytes; and thus, to the occurrence of ovulatory cycles,[46-48] the proposed mechanism by which parity and use of oral contraceptives may be the reason behind late age at natural menopause. As oral contraceptives reduce the ovulatory cycles early in life with preserving oocytes longer, this may result in late menopause.

Conclusion

In this study, Kaplan-Meier cumulative survivorship estimated mean as well as median age at menopause were found to be 48.43±4.1 years and 50.44±3.8 years respectively among rural women of Uttarkashi. Comparison of age at menopause with various international and regional populations reflected that the age at menopause has been highly variable among different regions of the world and within populations. Univariate cox proportional hazard model revealed that contraceptive ever use, educational level, occupation, duration of breast feeding and diet were the important determinants of timings of onset of menopause. Factors such as no use oral contraceptives, lower education level, longer duration of breast feeding, non-vegetarian diet were found to have associated with late age at menopause. It was also observed that systolic and diastolic blood pressure, body mass index, parity and marital status were not significant predictors of timing of onset of menopause.

Recommendations

Woman's health is an emerging issue during the recent decades owing to rapid increase in life expectancy. This study was an attempt to have in-depth understanding regarding timing of natural menopause and related factors among women of Uttarkashi district. Menopausal health is a significant indicator of overall health and general well-being of the women. With the increase in longevity, women spend a considerable proportion of their life in post-reproductive phase and experience many health concerns. The health-related issues in this phase of life are generally ignored by the women due to social or financial reasons.

Therefore, to generate awareness and health promotion of women living beyond menopause should be an integral part of the public health care system to minimize the challenges of women's mid-life.

Acknowledgement: This article is a part of unpublished Master's dissertation submitted to the Department of Anthropology, Panjab University, Chandigarh, India. Authors are thankful to UGC-CAS II, Department of Anthropology, Panjab University, Chandigarh, India for their support.

References

1. Rance NE. (2009). Menopause and the human hypothalamus: Evidence for the role of Kisspeptin/Neurokinin B Neurons in the Regulation of Estrogen Negative Feedback. Peptides; 30 (1): 111-122.
2. World Health Organization. (1996). Research on menopause in the 1990s. Report of a WHO Scientific Group. WHO technical series 866. Geneva, Switzerland.
3. Thurston Rebecca C, Karvonen-Gutierrez, Carrie A, Derby & Carol A. (2018). Menopause versus chronologic aging: Their roles in women's health. Menopause; 25 (8): 849-854.
4. Cramer DW & Xu H. (1996). Predicting age at menopause. Maturitas; 23: 319–326.
5. Harlow BL & Signorello LB. (2000). Factors associated with early menopause. Maturitas; 35 (1): 3-9.
6. Treloar SA, Do KA & Martin NG. (1998). Genetic influences on the age at menopause. The Lancet; 352 (9134): 1084-1085.
7. De Bruin JP, Bovenhuis H, Van Noord PAH, Pearson PL, Van Arendonk J AM, Te Velde ER & Dorland M. (2001). The role of genetic factors in age at natural menopause. Human Reproduction; 16 (9): 2014-2018.
8. Mahajan N, Aggarwal M & Bagga A. (2012). Health issues of menopausal women in North India. Journal of Mid-Life Health; 3 (2): 84-87.
9. Thakur M, Kaur M & Sinha AK. (2019). Assessment of menopausal symptoms in different transition phases using the Greene Climacteric Scale among rural women of North India. Annals of Human Biology; 46 (1): 46-55.
10. PrasadJB, Tyagi NK & Verma P. (2021). Age at menopause in India: A systematic review. Diabetes & Metabolic Syndrome: Clinical Research & Reviews; 15 (1): 373-377.
11. Ahuja M. (2016). Age of menopause and determinants of menopause age: A pan India survey by IMS. Journal of Mid-life Health; 7 (3): 126.
12. Bagga A. (2004). Age and symptomatology of Menopause: A case study. Obstet Gynaecol Today; 10: 660-666.
13. Singh M. (2012). Early age of natural menopause in India, a biological marker for early preventive health programmes. Climacteric; 15 (6): 581-586.
14. Dosi R, Bhatt N, Shah P & Patel R. (2014). Cardiovascular disease and menopause. Journal of Clinical and Diagnostic Research; 8 (2): 62-64.
15. Nicks KM, Fowler TW, Akel NS, Perrien DS, Suva LJ & Gaddy D. (2010). Bone turnover across the menopause transition. Annals of the New York Academy of Sciences; 1192 (1): 153-160.
16. Ley C J, Lees B & Stevenson JC. (1992). Sex-and menopause-associated changes in body-fat distribution. The American Journal of Clinical Nutrition; 55 (5): 950-954.
17. Birkhauser M H, Dennerstein L, Sherman S & Santaro N. The menopause and aging. In National Instititute of Health, Office of Research on Women's Health and Giovanni Lerenzini Medical Science Foundation (Eds.). International Position Paper on Women's Health and Menopause: A Comprehensive Approach. (pp. 23-42). National Institute of Health. Retrieved on 10 October, 2002, http://www.nhlbi.nih.gov/health /prof/heart/other/wm-menop . pdf.

18. Do KA, Treloar SA, Pandeya N, Purdie D, Green AC, Heath AC & Martin NG. (1998). Predictive factors of age at menopause in a large Australian twin study. Human Biology; p. 1073-1091.
19. Treloar A, Susan Sheda S, Kim-Anh Do, Nicholas G & Martin Cornelis BL. (2000). Birth weight and age at menopause in Australian female twin pairs: Exploration of the fetal origin hypothesis. Human Reproduction; 15 (1): 55-59.
20. Baird DD, Tylavsky FA & Anderson JJB. (1998). Do vegetarians have earlier menopause? American Journal of Epidemiology; 128 (4): 907-908.
21. Weiner JS & Lourie JA. (1981). Practical human biology international biological programme handbook No. 9; Academic, London.
22. World Health Organization. (2000). Obesity: Preventing and managing the global epidemic (No. 894).
23. Rahman SA, Zainudin SR & Mun VLK. (2010). Assessment of menopausal symptoms using modified Menopause Rating Scale (MRS) among middle age women in Kuching, Sarawak, Malaysia. Asia Pacific family Medicine; 9 (1): 5.
24. Palacios S, Henderson VW, Siseles N, Tan D & Villaseca P. (2010). Age of menopause and impact of climacteric symptoms by geographical region. Climacteric; 13 (5): 419-28. DOI: 10.3109/13697137. 2010.507886.
25. Walsh RJ. (1978). The age of the menopause of Australian women. Med. J. Aust.; 2: 182–215.
26. Chow SN, Huang CC & Lee YT. (1997). Demographic characteristics and medical aspects of menopausal women in Taiwan. Journal of the Formosan Medical Association Taiwan yizhi; 96 (10): 806-811.
27. Carda SN, Bilge SA, Öztürk TN, Oya G, Ece O & Hamiyet B. (1998). The menopausal age, related factors and climacteric symptoms in Turkish women. Maturitas; 30 (1): 37-40.
28. Castelo-Branco C, Blumel JE, Chedraui P. et al. (2006). Age at menopause in Latin America. Menopause; 13 (4): 706-712.
29. Wasti S, Robinson SC, Akhtar S & Khan N Badaruddin. (1993). Characteristics of menopause in three socioeconomic urban groups in Karachi, Pakistan. Maturitas; 16 (1): 61-69.
30. Blumel JE, Cubillos M, Brandt A, Munoz L & Ayarza E. (1998). Various clinical aspects of menopause. Rev Chil Obstet Ginecol.; 53 (5): 278-282.
31. Sidhu S, Kaur A & Sidhu M. (2005). Age at menopause in educated women of Amritsar (Punjab). Journal of Human Ecology; 18 (1): 49-51.
32. Kapur P, Sinha B & Pereira BM. (2009). Measuring climacteric symptoms and age at natural menopause in an Indian population using the Greene Climacteric Scale. Menopause; 16 (2): 378-384.
33. Dutta R, Dcruze L, Anuradha R, Rao S & Rashmi MR. (2012). A population based study on the menopausal symptoms in a rural area of Tamil Nadu, India. J Clin Diagn Res.; 6: 597-601.
34. Satpathy M. (2016). A study on age at menopause, menopausal symptoms and problems among urban women from western Odisha, India. International Journal of Scientific and Research Publications; 6 (3): 422-427.
35. Thakur M, Kaur M & Sinha AK. (2017). A study of age at natural menopause and associated factors among rural postmenopausal women of Kanpur, India. Indian Journal of Psychological Science; 9 (1): 144-160.
36. Li L, Wu J, Pu D, Zhao Y, Wan C, Sun L & He X. (2012). Factors associated with the age of natural menopause and menopausal symptoms in Chinese women. Maturitas; 73 (4): 354-360.
37. Gold EB, Crawford SL, Avis NE, Crandall CJ, Matthews KA, Waetjen LE & Harlow SD. (2013). Factors related to age at natural menopause: Longitudinal analyses from SWAN. American Journal of Epidemiology; 178 (1): 70-83.

38. Bromberger JT, Matthews KA, Kuller LH, Wing RR, Meilahn EN & Plantinga P. Prospective study of the determinants of age at menopause. American Journal of Epidemiology; 145 (2): 124-133.
39. Henriquez MS, Rodriquez NMC & Canal L. (1994). Age of menopause onset in Canary Islands women. Rev SanidHig Publica (Madr); 68: 38
40. Parazzini F. (2007). Determinants of age at menopause in women attending menopause in clinics Italy. Maturitas; 56 (3): 280-287.
41. Zamaniyan M, Moosazadeh, M, Peyvandi S, Jaefari K, Goudarzi R, Moradinazar M & Kheradmand M. (2020). Age of natural menopause and related factors among the Tabari cohort. Journal of Menopausal Medicine; 26 (1): 18-23. doi: 10.6118/jmm.19004.
42. Chasan-Taber L, Willett WC, Manson JE, Spiegelman D, Hunter DJ, Curhan G & Stampfer MJ. Prospective study of oral contraceptives and hypertension among women in the United States. Circulation; 94 (3): 483-489.
43. Staessen JA, Celis H & Fagard R. (1998). The epidemiology of the association between hypertension and menopause. Journal of Human Hypertension; 12: 587–592.
44. Gold EB, Bromberger J, Crawford S, Samuels S, Greendale GA, Harlow SD & Skurnick J. (2001). Factors associated with age at natural menopause in a multiethnic sample of midlife women. American Journal of Epidemiology; 153 (9): 865-874.
45. Luoto R, Kaprio J & Uutela A. (1994). Age at natural menopause and socio-demographic status in Finland. American Journal of Epidemiology; 139 (1): 64-76.
46. Stanford JL, Hartge P, Brinton LA, Hoover RN & Brookmeyer R. (1987). Factors influencing the age at natural menopause. Journal of Chronic Diseases; 40 (11): 995-1002.
47. Whelan EA, Sandler DP, McConnaughey DR & Weinberg CR. (1990). Menstrual and reproductive characteristics and age at natural menopause. Maturitas; 12 (4): 371.
48. Cramer DW, Xu H & Harlow BL. (1995). Family history as a predictor of early menopause. Fertility and Sterility; 64 (4): 740-745.
49. Tungphaisal S, Chandeying V, Sutthijumroon S, Krisanapan O & Udomratn P. (1991). Postmenopausal sexuality in Thai women. Asia-Oceania Journal of Obstetrics and Gynaecology; 17 (2): 143-146.
50. Morabia A & Costanza MC. (1998). WHO collaborative study of neoplasia and steroid contraceptives. International Variability in Ages at Menarche, First Livebirth, and Menopause. Am J Epidemiol;148: 1195-1205.
51. Kato Ikuko, Paolo Toniolo, Arslan Akhmedkhanov, Karen L Koenig, Roy Shore, & Anne Zeleniuch-Jacquotte. (1998). Prospective study of factors influencing the onset of Natural Menopause. Journal of Clinical Epidemiology; 51 (12): 1271–1276.
52. Dasgupta D & Ray S. (2009). Menopausal problems among rural and urban women from eastern India. Journal of Social, Behavioural, and Health Sciences; 3 (1): 2.
53. Rülu P, Dhall M & Kapoor S. (2016). Measuring climacteric symptoms: A community-based study among Lotha females of Nagaland. Women Health Open Journal; 2 (1): 1-7.

स्वास्थ्य एवं जनसंख्या :
परिप्रेक्ष्य एवं मुद्दे, 43 (2): 91–102/ अप्रैल–जून 2021

उत्तरकाशी की महिलाओं में प्राकृतिक रजोनिवृत्ति पर आयु के निर्धारक

***मनिंदर कौरए ** महकप्रीत कौर और ***मोनिका ठाकुर**

*सहायक प्रोफेसर, ई–मेलः maninderkaur_1@yahoo.in; **रिसर्च स्कॉलर, ई–मेलः mehakpreet1007@gmail.com;
मानव विज्ञान विभाग, पंजाब विश्वविद्यालय, चंडीगढ़, भारत–160014।
***वरिष्ठ परियोजना वैज्ञानिक, भारतीय प्रौद्योगिकी संस्थान, कानपुर, ई–मेलः monikathakur16@gmail.com

सह संपादकः

डॉ. आर. शाहरावत, सहायक प्रोफेसर एवं प्रभारीः क्लिनिक, राष्ट्रीय स्वास्थ्य एवं परिवार कल्याण संस्थान, नई दिल्ली।

समीक्षकः

डॉ. डी.के. यादव, सहायक प्रोफेसर, सांख्यिकी और जनसांख्यिकी विभाग, राष्ट्रीय स्वास्थ्य एवं परिवार कल्याण संस्थान, नई दिल्ली।
डॉ. मोनिका सैनी, सहायक प्रोफेसर, सामाजिक विज्ञान विभाग, राष्ट्रीय स्वास्थ्य एवं परिवार कल्याण संस्थान, नई दिल्ली।

सारांश

वर्तमान अध्ययन, भारत के उत्तरी राज्य उत्तराखंड के उत्तरकाशी जिले की महिलाओं में रजोनिवृत्ति की उम्र–निर्धारण का मूल्यांकन करने का प्रयास करता है। रजोनिवृत्ति के बाद की तैंतालीस महिलाओं पर आंकड़े एक प्रश्नावली का उपयोग करके एकत्र किये गए थे, जिसमें रजोनिवृत्ति की उम्रए स्तनपान की अवधिए समानताए गर्भपात की संख्याए मौखिक गर्भनिरोधक का उपयोग और सामाजिक–आर्थिक विशेषताओं के बारे में जानकारी शामिल थी। महिलाओं की रजोनिवृत्ति की औसत आयु 48.43 वर्ष थी। यूनीवेरिएट रिग्रेशन विश्लेषण में पता चला है कि मौखिक गर्भनिरोधक का उपयोग न करने वाली महिलाओं में लंबी प्रजनन अवधि तथा रजोनिवृत्ति की उम्र अधिक (48 वर्ष) थी। शाकाहारी भोजनए कम बीएमआई और उच्च शिक्षित महिलाओं में रजोनिवृत्ति पर औसत आयु जल्दी पाई गईए जिनकी समता 4 से कम थी । अध्ययन ने रजोनिवृत्ति की शुरुआत के समय के महत्वपूर्ण निर्धारकों के रूप में मौखिक गर्भनिरोधकए शैक्षिक स्थितिए व्यवसायए स्तनपान की अवधि और आहार के उपयोग की पहचान की गई।

मुख्य शब्दः रजोनिवृत्ति के बाद, रजोनिवृत्ति की आयु, प्रजनन काल, मौखिक गर्भ निरोधक।

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Example of References

Journal Article

1. Halpen SD, Ubel PA, Caplan AL. Solid-organ transplantation in HIV-infected patients. N Engl J Med. 2002 Jul 25;374(4):284-287

Journal article with more than 6 authors

2. Kawamura R, Miyazaki M, Shimizu K, Matsumoto Y, Silberberg YR, Ramachandra Rao S, et al. A new cell separation method based on Antibody-immobilized nanoneedle arrays for the detection of intracellular markers, Nano Lett.2017Nov 8;17(11):7117-7124

Book/Monograph Entry

3. Carlson BM. Human embryology and developmental biology. 3rd ed. St. Louis: Mosby; 2004.

Chapter in a Book

4. Yadav A. Sharma KKN. Awareness of reproductive and child health care programme among Rajgonds tribe of Sagar district, Madhya Pradesh. In: Sharma K.K.N., editor. Reproductive and child health problem in India. New Delhi: Academic Excellence; 2005, pp. 592-597.

Electronic material

5. World Health Organization (WHO). Mortality country fact sheet 2006 [internet]. Geneva: WHO; 2006. Available from: www.who.int/whosis/mort_emro_pak_pakistan.pdf (Accessed 27 August 2018)

Reports

6. Reddy, K. Srinath, and Gupta, Prakash C (ed). Tobacco Control in India. Ministry of Health and Family Welfare, Government of India, Centre for Disease Control and Prevention, USA and World Health Organization. Report, 2004.

THE NATIONAL INSTITUTE OF HEALTH AND FAMILY WELFARE

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PRINTED AND PUBLISHED BY THE DIRECTOR,
The National Institute of Health and Family Welfare, Munirka, New Delhi-110067
Website: www.nihfw.org