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Jaishree Kapur and Harshit Nigam | DUJES Volume 28 | 2020 Issue

Choice(s) and Whose Choice(s)? : De-construction of Choice(s) in *Fire* and *Queen*

Jaishree Kapur and Harshit Nigam

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Harshit Nigam is an academic, scholar, and poet from Delhi. His areas of interest include but not limited to Film Studies, Gandhian Discourses, Modernism and Postmodernism, Gender, and Caste Studies. Harshit works as an Assistant Professor (Guest) at Miranda House, Delhi University.

Abstract

"What it is that constitutes, or ought to constitute, the category of woman?" asks Judith Butler in her essay, 'Subjects of Sex/Gender/Desire'. Refusing to accept the very subject of 'woman' in stable or abiding terms, she interrogates the "immutable character of sex" to foreground that one's sexual identity is as much socially constructed as one's gendered identity. Thus one is forced to reflect on Butler's question, "Can construction be reduced to choice?" What happens when a person rejects this constructed identity and doing so explores the multiple selves? This paper is an attempt to understand the evolving 'self' of women in the Indian Cinema through the case study of Deepa Mehta's *Fire* (1996) and Vikas Bahl's *Queen* (2014), and to analyze therein the limited 'choices' granted to the women, preconditioned by the disciplinary institutions, such as religion, custom, home, family, marriage, society, and how the women explore their identity by widening or 'de-constructing' the scope of these monolithic 'choices'. The paper neatly divided into four sections will contextualize the films against the backdrop of the 'liberal' and the 'new' economy, followed by a close reading of the films, and conclude with an attempt to question the limited assertion of the 'choices' in the select films. More specifically, the authors probe the narrow and the limited scope of this 'de-construction' as the 'choices' are being regulated by the spectators, the performers, and the filmmakers within the [illegible] urban cultural matrix.

AUTHOR INDEX

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CONTENTS

CASTE OPPRESSION AND CONTINUOUS DICHOTOMIES: A CRITICAL STUDY*

BY

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ABSTRACT

Oppression is ubiquitous; it manifests in all the societies at multiple levels. Caste oppression continues to be an intrinsic part of Indian society even today. Several Indian thinkers, philosophers, writers, poets, artists and social activists have raised their voice against this issue from time to time. Writing at a time when India was grappling with struggle against both the imperial powers and the problem of untouchability, Premchand presented a story as early as the beginning of nineteen thirties that directly responded to the dichotomies between Brahmin superior order and untouchable inferior individual to lay bare the workings of caste oppression. The objective of this paper is to present a close textual analysis of various dichotomies presented in the short story, 'Sadgati' translated as 'The Deliverance' by David Rubin that throw light on the insidious functioning of caste oppression.

KEYWORDS

Caste, Oppression, Dichotomies, Agency, Rejection, Silence.

INTRODUCTION

'Sadgati' is a story about an honest, hardworking tanner called Dukhi who visits the village Brahmin, pundit Ghasiram in order to request him to allot an auspicious day for the marriage of his daughter and in turn, is exploited to the extent that he loses his life while serving the Brahmin. The seemingly uncomplicated story is layered with caste oppression and dichotomies in every new idea that Premchand unravels as the narrative proceeds. Interestingly, the choice of the names of characters placed

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MAPPING THE MARGINALIZATION: THE PROBLEM OF CASTE DYNAMICS IN PREMCHAND

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Abstract

Dhanpat Rai Shrivastava (1880-1936), popularly addressed as Munshi Premchand strove hard to make literature a potent tool that can respond to the social evils enmeshed in the Indian society. With Premchand's espousal of realism, latent with a zeal to bring a reformist transformation in the society, Hindi literature witnessed a qualitative growth in terms of thematic concerns. While he has been widely discussed for his treatment of characters who face economic struggle, a serious scholarship is lacking with respect to Premchand's literary oeuvre vis-à-vis the issue of caste. Mapping the marginalization based on the issue of caste thus becomes a critical point to understand the literary politics of the author. The objective of this paper is chart out the author's treatment of low caste characters in his rich literary corpus that includes both his fictional as well as non-fictional works. It further makes an attempt to problematize the issue of caste as delineated in his characterisation by invoking critical responses made on his works. In addition to this, the paper attempts to situate his ideas within the debate of insider and outsider foregrounded by Dalit scholars and simultaneously present an instance of revisionist reading of his work by a Dalit scholar.

Key Words: PWA, Realism, Caste, Marginalization, Location, Revision

The *chaturvarna* caste hierarchies have been challenged by historians, authors, poets, filmmakers and artists from different literary and cultural backgrounds from time to time. Much before Premchand was selected as the President of Progressive Writers Association (PWA), he presented progressive or *pragatisheel* ideas in his literary works, speeches and ideological stance. The pan national socio-religious movements toward the abolition of the social evil that manifested itself in the form of caste hierarchies in India were ripe when Premchand committed himself to writing. Sara Rai in her essay, 'Realism as a Critical Process: Features of Munshi Premchand's Ideology' traces the influence of both Arya Samaj and Bolshevist regime on him as well as his strong affiliation and consequent disillusionment with the Gandhian ideals. His constant focus on honest depiction of the realities of the marginalised sections of the society—suffering of the poor, deprivation and oppression became a hallmark of his work. However, a common charge directed against Marxist writers that they subsume the struggle against caste oppression under the homogenising rubric of class struggle, does not hold entirely relevant in case of Premchand. In fact, his first short story written merely at the age of thirteen painfully charts the social ignominy enmeshed within the social structures that reek of caste hierarchies. Interestingly, he also edited periodicals such as 'Hans', 'Jagran', 'Madhuri', 'Zamana', 'Maryada' which time and again presented a scathing attack on caste system prevalent in the society. The literary scholar Chaman Lal's essay, "Premchand Sahitya Mei Dalit Vimarsh" published in *International Seminar on 125th Anniversary of Premchand* quotes the author's article published on 14th November, 1932 where he presents a sharp indictment on the hypocrisy of the upper caste regarding the temple entry for Harijans in the following words:

> *Achut ke paise toh aap bedhadak le lete hai achut koi mandir banaye, aap dal bal ke saath jayenge, mandir mei devta ki sthapana karenge, tar mal khayenge, ha achut ne use chua na ho. Dakhshina lenge, isme koi harz nahi, na hona chahiye. Lekin achut mandir mei nahi ja sakta, usne devta apavitra ho jayenge. (Pg448)(in Lal 5)*
>
> You would take money from an untouchable without any objection, if an untouchable builds a temple, you would sit there with your powerful group, place your idol, eat your full meal, provided it has not been touched by that untouchable. You would accept the offering guiltlessly but the untouchable cannot step inside the temple because that shall pollute the God [translation mine]

Lal continues to trace the essay of Premchand that envisions a country bereft of strict caste identities in the following words:

> *Hum jis rashtra ka swapn dekh rahe hai, usme toh janmgat varno ki ghandh tak na hogi veh hmare shramiko aur kisaano ka samrajya hoga, jisme na koi brahman hoga, na harijan na kayastha na Kshatriya. Uske sabhi bharatwasi honge. sabhi brahman honge ya sabhi harijan honge (Pg 473) (in Lal 5)*
>
> "The nation of our dreams would not stink of caste based *varnas*, it would be a state of our labourers and peasants without any bifurcation between brahmins, harijans or kayastha. All (the groups) shall be Indian citizens, all brahmins or all harijans." [Translation mine]

His literary works are replete with instances of characters who can be posited as low caste within the social hierarchy. In 'Sava-Ser-Gehun' (A Seer and Quarter of Wheat, 1924), the author situates the narrative within a caste based feudal exploitative society where a poor man named Shankar borrows wheat from the upper caste Brahmin landlord only to become a victim of eternal debt and perpetual exploitation. In 'Mandir' (The Temple, 1927) a poverty stricken untouchable woman called Sukhiya visits the temple stairs to pray for the early recovery of her sick son but fearing the pollution that this act can cause, the temple pundit alarms the upper caste groups who come forward to strike her as a result of which she leaves her son who eventually falls from the

Thermal and Flame Retardant Properties of FR Viscose Fibre and its Blends

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Abstract
Inherent flame retardant fibres such as Aramids, FR-viscose, Modacrylicetc are widely used for making durable flame retardant clothingfor the workers working in petrochemical, foundries, aerospace, fire-fighting, defense etc. Although the clothing made out of these fibres are well known for protection against fire hazards, however sometimes these clothing are also required to have additional comfort properties. In this study, to achieve additional comfort properties, FR-Viscose fibre is blended with Nylon 6 6, Modacrylic, Thermo-cool and Meta-aramid fibres to develop binary blended yarns on ring spinning system. These yarns are converted in to 17 woven fabrics having same constructional parameters.These fabric samples are evaluated for durability, safety (heat& flame) and comfort properties.It is observed that with the addition of FR-Viscose fibre in the various blends, comfort properties are improved with decrease in durability (tensile, tear and abrasion strength). Multivariate analysis of variance (MANOVA)has been applied to find out the effect of presence of FR-Viscose in binary blends on various heat& flame properties. It is observed that there is relationship between FR-Viscose fibre contents in the blend and heat &flame resistant properties.

Keywords
Aramid fibres, Convective heat, FR viscose, LOI, Radiant heat

1. Introduction

In order to provide protection from various occupational hazards like chemical, biological, nuclear, bullet, knives, flame, radiant heat, hot liquid, steam etc, varieties of specialized protective clothing have been developed, and are widely used by workers in the industrial and government sectors. These specialized protective clothing can be categorized as chemical protective clothing, biological (microbial) protective clothing, nuclear protective clothing, puncture- or cut-resistant (bullet-/knife-proof) protective clothing, and thermal (flame and heat) protective clothing [1]. Among these types of specialized protective clothing, thermal protective clothing has a particular significance.

It is well known fact that the conventional clothing fabrics made from natural fibers, polyester fibers and nylon fibers can ignite and continue to burn. In addition to this, fabric made out of thermoplastic fibres like polyester and nylon are having melting and dripping properties which can lead to more severe burn injuries to the wearers[2]. To protect the wearers from such fire hazards there is a need of fire-retardant clothing. This can significantly reduce the extent and severity of burn injuries. Beside this, it provides time to the wearer to get away from burning environment. Therefore, fire-retardant clothing should protect wearer from fire and heat by providing insulation as well as high dimensional stability of the fabrics, so that, upon exposure to the high heat fluxes that are expected during the course of the wearer's work, they will neither shrink nor melt[3].

Inherent flame retardant fibres such as Aramids, FR-viscose, Modacrylic etc are widely used for making durable flame retardant clothing. These fibers come in the category of heat-resistant and strong synthetic fibers and can be used for making various protective gears [3] in petrochemical, foundries, aerospace, fire-fighting, military applications etc. Although these fibres provide good protection against flame and heat, sometimes the clothing made out of these do not fulfill the requirements of the user in terms of comfort (except FR-Viscose) and high abrasion resistance. To fulfill

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Review Article

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Lifestyle-related advice in the management of obesity: A step-wise approach

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Abstract:

Obesity is a commonly encountered health-care problem that is an independent risk factor for chronic metabolic complications. Primary care physicians are the first point of contact in the management of obesity. Weight management is a step-wise intensification of interventions that initiates with lifestyle modification. Dietary and physical activity advices are integral components of all weight loss consultations and should ideally be imparted by a dietician or a nutritionist. In case of their nonavailability, the onus for lifestyle counseling rests with the physician. The prescription for a low-calorie diet coupled with increased physical activity might seem simple, but the success lies in compliance and sustainability of this advice. Compliance can be enhanced through patient-specific diet and activity plans along with corrections in eating and activity behavior. Barriers in patient's environment must also be addressed to achieve sustainable weight loss. This review covers practical insights in standard lifestyle management techniques, which can help the physicians to set better weight loss goals, adapt to patient specific lifestyle counseling, and apply strategies to enhance compliance for sustained weight loss.

Keywords:

Caloric restriction, exercise, obesity management, primary care physician, weight loss

Introduction

Obesity is a widespread health issue and its prevalence is increasing at an alarming rate. More than half of the patients attending primary care clinics are obese.[1] Obesity is an independent risk factor for chronic metabolic complications such as diabetes, hypertension, cardiovascular diseases, and some forms of cancer. These patients have compromised functional ability and quality of life due to progressive and relapsing nature of obesity and related comorbidities.[2] The incorporation of obesity-related advice in general practice is mandatory to effectively manage the rising health-care burden of lifestyle-related diseases.

General practitioners have a crucial role in medical assessment, management, and counseling of obese patients.[3] Ideally, physician refers obese patient to a comprehensive weight management program utilizing the expertise of dietitian, exercise physiologist, and psychologist for weight reduction. These facilities might not be readily available at various levels of health-care units, witnessing a high burden of obese patients. It is important for the physician to seek guidance regarding lifestyle advice and pharmacological approaches to effectively manage obese patients.

Lifestyle modification is the cornerstone for weight management. It includes behavioral techniques for correction of eating and activity behaviors leading to weight gain.[4] Weight reduction is generally initiated with corrections in eating habits. Progressive calorie restriction and type of diet determine the pace of weight regulation, alter appetite signals, and inculcate correct food

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Research Article

Impact of COVID-19 on lifestyle-related behaviours- a cross-sectional audit of responses from nine hundred and ninety-five participants from India

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ABSTRACT

Background and aims: The impact of measures taken to contain COVID-19 on lifestyle-related behaviour is undefined in Indian population. The current study was undertaken to assess the impact of COVID-19 on lifestyle-related behaviours: eating, physical activity and sleep behaviour.

Methods: The study is a cross-sectional web-based survey. A validated questionnaire to assess the changes in lifestyle-related behaviour was administered on adults across India using a Google online survey platform.

Results: A total of 995 responses (58.5% male, mean age 33.3 years) were collected. An improvement in healthy meal consumption pattern and a restriction of unhealthy food items was observed, especially in the younger population (age <30 years). A reduction in physical activity coupled with an increase in daily screen time was found especially among men and in upper-socio-economic strata. Quarantine induced stress and anxiety showed an increase by a unit in nearly one-fourth of the participants.

Conclusions: COVID-19 marginally improved the eating behaviour, yet one-third of participants gained weight as physical activity declined significantly coupled with an increase in screen and sitting time. Mental health was also adversely affected. A detailed understanding of these factors can help to develop interventions to mitigate the negative lifestyle behaviours that have manifested during COVID-19.

1. Introduction

COVID-19 is a global burden which continues to redefine daily lifestyle-related habits in a significant manner as the pandemic progresses through its different phases. Public health recommendations and government measures taken to abate infection have indirectly impacted food availability, dietary quality, normal daily activities, access to recreational public settings, social activities, work and financial security [1]. These factors compound over time to radically change lifestyle-related behaviours, especially daily eating, activity and sleep behaviours that are known to be independent risk factors for metabolic complications such as obesity, diabetes and cardiovascular disorders [2,3].

Few preliminary studies from the west have highlighted a negative impact on various lifestyle-related behaviours as a potential implication of COVID-19. However, these studies were done during the complete lockdown phase and suffer from methodological limitations like less representative sample and non-validated tools for data collection. Moreover, the interplay of the severity of COVID-19 infection with different social, economic and cultural constructs in determining the extent of changes in

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Development and validation of a questionnaire to evaluate the impact of COVID-19 on lifestyle-related behaviours: eating habits, activity and sleep behaviour

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Abstract

Objective: This study was conducted to develop and validate a questionnaire to assess the impact of COVID-19 pandemic on lifestyle-related behaviour related to eating, activity and sleep pattern.

Design: Indexed study used a mixed method design. Phase I employed qualitative methods for development of questionnaire including literature review, focus group discussion, expert evaluation and pre-testing. Phase II used quantitative methods for establishing construct validity of the questionnaire via parallel factor analysis.

Participants: Phase 1 involved participation of experts from different fields (Departments of Medicine, Nutrition and Clinical Psychology) and general adult population. For phase II, data were collected from 124 adult respondents (female = 57·26 %); mean age (36 ± 14·8 years) residing in an urban setting.

Results: The questionnaire consisted of three sections: (A) socio-demographic and anthropometric parameters, (B) twenty-four items each for investigating the changes in eating, activity and sleep behaviour before *v.* during COVID-19, (C) six items assessing COVID-19 specific reasons for lifestyle change. The Cronbach's α value of the questionnaire is 0·83 suggesting its good internal consistency.

Conclusions: This appears to be a valid tool to assess the impact of COVID-19 on lifestyle-related behaviours with potential utility for public health researchers to identify these changes at community level and develop strategies to reinforce corrective behaviours.

Keywords
COVID-19
Pandemic
Lifestyle-related behaviour
Questionnaire
Internal consistency
Validation

COVID-19 pandemic is a global burden that has far-reaching medical, social and behavioural implications. Evidence from past outbreaks has shown that as a pandemic evolves it has substantial impact on the lifestyle-related behaviours, which in turn poses a challenge in the maintenance of health and nutritional status[1]. The measures taken to contain the virus such as confinement and self-isolation might promote unhealthy behaviour (poor diet, sedentariness, less physical activity and disturbed sleep pattern) and distress that can potentially contribute to obesity and associated cardiometabolic risks[2]. It is important to understand the extent of changes in lifestyle-related behaviours and its underlying COVID-19 specific reasons to counteract these changes for maintenance of optimal health status at individual and community level. Of late, a couple of studies have used online surveys to assess the impact of COVID-19 on lifestyle-related behaviours. Although such online surveys yield data in a short period of time, they suffer the limitation of using a non-validated set of questionnaires[3]. Few studies have used a comprehensive list of valid questionnaires to assess significant lifestyle-related behaviour[4,5]. Although valid and reliable, they are more complex to administer and lack information on issues and challenges specific to the current pandemic situation.

There is a paucity of validated questionnaires that can assess the lifestyle-related changes specific to COVID-19

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ARTICLE

Nutrition in acute and chronic diseases

Gluten content in labeled and unlabeled gluten-free food products used by patients with celiac disease

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Abstract

Objective Gluten-free (GF) diet is the only reliable treatment for patients with celiac disease (CeD), but data on the extent of gluten contamination in GF food available in India is scanty. We evaluated gluten content in labeled, imported, and non-labeled GF food products currently available in the Indian market.

Methods Overall, 794 processed and commercially available packaged GF products (labeled GF ($n = 360$), imported GF ($n = 80$), and non-labeled/naturally GF ($n = 354$)) were collected from supermarkets of National Capital Region of India. Those unavailable in stores were purchased from e-commerce sites or directly from the manufacturers. Gluten level in them was determined by Ridascreen Gliadin sandwich R5 enzyme-linked immunosorbent assay (R-Biopharm AG, Germany). As per Codex Alimentarius and Food Safety and Standard Authority of India, "gluten free" labeled products must not contain > 20 mg/kg of gluten.

Results Overall, 10.1% of 794 GF products including 38 (10.8%) of 360 labeled and 42 (11.8%) of 354 non-labeled/naturally GF food products had gluten content > 20 mg/kg (range: 24.43–355 and 23.2–463.8 mg/kg, respectively). None of the imported GF products had gluten more than the recommended limits. Contaminated products most commonly belonged to cereal and their products (flours, coarse grains, pasta/macaroni, snack foods) pulse flours, spices, and bakery items.

Conclusions A substantial proportion (10.1%) of GF food products (both labeled and non-labeled) available in India have gluten content greater than the prescribed limits of <20 mg/kg. Physicians, dietitians, support group, and patients with CeD should be made aware of this fact and regulatory bodies should ensure quality assurance.

Introduction

Celiac disease (CeD), a genetically mediated autoimmune enteropathy, is triggered by ingestion of gluten in susceptible individuals [1]. Lifelong and complete adherence to gluten-free diet (GFD) is the only effective treatment for CeD presently [2]. The Codex Alimentarius [3], European Commission in 2009 [4], Food and Drug Administration (FDA) in 2013 [5], and Food Safety and Standards Authority of India [6] have defined "gluten free" as those food items that have <20 mg/kg (or 20 parts per million, ppm) of gluten.

Despite the availability of a wide range of naturally (by origin) and industrially prepared gluten-free (GF) food products, it is hard for patients to maintain a GFD. Approximately 15–40% patients with CeD persist to have enteropathy despite maintaining GFD, one of the reasons being inadvertent intake of gluten [7]. Intake of even 50 mg of gluten/day has been demonstrated to maintain the

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OBESITY Reviews WILEY

Predictors of successful weight loss outcomes amongst individuals with obesity undergoing lifestyle interventions: A systematic review

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Summary

Understanding the predictors of weight loss with lifestyle interventions can help to ascertain the probable outcomes of individuals with obesity who undergo such interventions. This systematic review assessed the evidence of predictors of successful weight loss among individuals who are overweight or with obesity undergoing lifestyle interventions. Four electronic databases (PubMed, Cochrane Reviews, PsychInfo and Wiley) were searched to find relevant literature published in the past 20 years. A total of 1351 titles were identified in the initial search, of which 23 studies were finally included. Predictors were synthesized in the domains of sociodemographic factors, anthropometric parameters, psychological and behavioural factors and intervention-based factors. The overall quality of evidence on predictors was then appraised using an adapted GRADE approach. Patient-specific factors such as being male, older in age, having existing cardiometabolic comorbidities and limited fat intake were significantly associated with weight loss success. Amongst intervention specific predictors, greater initial weight loss and higher adherence to lifestyle advice were associated with greater weight loss success. In this review, initial weight loss came out to be as the most important predictor of successful weight loss outcome.

KEYWORDS
behavioural intervention, determinants, diet, physical activity

1 | INTRODUCTION

'Why patients with obesity are not losing weight?' is an important question in the management of obesity. Obesity is a public health disease with widespread metabolic, psychological and social implications.[1] Given the obesity epidemic worldwide, significant measures have been taken for its management. One of the core measures recommended for achieving clinically significant weight loss (5%–10% reduction from baseline) is comprehensive lifestyle modification. An intensive lifestyle counselling programme is delivered by dietitians or trained health care professionals to help patients adapt to corrective dietary and physical activity habits.[2] However, only a small proportion

Abbreviations: BMI, body mass index; BMR, basal metabolic rate; DPP, Diabetes Prevention Program; GRADE, Grading of Recommendations Assessment, Development and Evaluation; IRSD, index of relative socio-economic disadvantage; M-HRQoL, mental health-related quality of life; PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses; PROSPERO, International Prospective Register of Ongoing Systematic Reviews; T2DM, type 2 diabetes; TFEQ, Three Factor Eating Questionnaire.

Review Article

Industrially Produced Trans Fat: Usage, Health Implications, Global and Indian Regulations

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Summary

Global momentum is growing for the total elimination of industrially produced trans fats from the food systems as they are known to have deleterious health effects on various body functions particularly the cardiovascular health. Many developed nations such as Denmark have completely eliminated the use of industrially produced trans fats from the food supply. India is undergoing a significant nutrition transition that has substantially increased the intake of processed and ready-to-eat foods, abundant in trans fats. The Indian regulator-Food Safety and Standards Authority of India is all set to reduce the industrially produced trans fats to <2% by the end of year 2021 in a phased manner. Multiple strategies such as reducing trans fat limit in oils and fats, mandatory labeling on food products, introduction of "Trans-fat free" claim and logo have been adopted by the Indian regulatory body, to achieve the goal of trans fat free India. This review comprehensively summarizes from a public health perspective the usage of industrially-produced trans fats in Indian food industry, its effects on health, the global strategies to limit its content, and the current Indian regulations.

Key words: Food Safety and Standards Authority of India, global regulations, industrially produced trans fat, mandatory labeling, trans fat free

Introduction

"Trans fat" has been the buzzword in the food industry and public health care for a long time now. The food industry has been using trans fats since 1960s due to their functional properties such as plasticity, emulsion stability, and low cost, which make them a mainstay in commercially produced processed food items such as margarines, vegetable shortenings, bakery products, and other snacks and fast food.

In the nineties, research evidence started linking industrially produced trans fat consumption with the risk of developing coronary heart disease-a fact that subsequently became well established and built a public health thrust for their total elimination from the global food supply. Many high-income nations such as Canada, Denmark, Austria, and Switzerland have taken a series of policy, regulatory, and industry-based initiatives to limit its consumption.[1] The World Health Organization (WHO) has announced to completely remove trans fats from the food supply by 2023.

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Low- and middle-income countries are also taking necessary steps in this direction. The Indian regulator, Food Safety and Standards Authority of India (FSSAI) has taken bold and realistic initiatives to reduce the trans fat content in all oils and fats, including vanaspati, bakery shortenings, and margarines to <2% by the end of 2021. A number of practical and effective measures such as introducing trans fat limit, mandatory labeling on food products, introduction of 'Trans-fat free' claim and logo have been taken in this direction of achieving the goal of trans-fat free India.

The aim of this review is to encapsulate from a public health perspective the usage of industrially produced trans fat in the food industry, its implications on health, the global strategies to limit its content, and the existing Indian regulations.

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Making the *'Invisible'* visible: Custodial violence and the civil liberties-democratic rights movement in India

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ABSTRACT

Civil Liberties and Democratic Rights Movement (henceforth CLDR movement) in India has been documenting and highlighting the issue of custodial violence for long. This paper attempts to cull out the nuances of the engagement of the civil and democratic rights movement in India with the issue of custodial violence over a period of time. The paper analyses some of the reports by the CLDR organizations, particularly, People's Union for Democratic Rights (PUDR) which are based upon the fact-findings done by these civil rights organizations. The fact-finding reports of the CLDR organizations are examined to form an understanding of the process through which the CLDR organizations approach the issue of custodial violence and the challenges therein. It also reveals the manner in which the CLDR groups foreground the voices of the people who suffered.

The paper further seeks to show that the intervention of the civil and democratic rights movement on the issue of custodial violence in India made the practice of violence in custody 'visible' to the larger public pointing to the systematic and institutional failure of the Government to address the issue. Through its fact findings, the CLDR movement has tried to document and disseminate facts regarding torture and deaths in custody of security establishments like the police, and sexual violence in custody. In this process, the movement has also continuously jostled with the given understanding on 'custody' arguing for an expansion of its meaning and has sought to redefine the notion of crime, criminality and punishment.

1. The police and custodial violence

The Police system in India in its present form evolved under the British colonial rule in India in nineteenth century. The British enacted the Police Act in India in 1861. The Police Act of 1861 conceived of the Police as a 'force' and had details of how this police force is to be constituted. The Act wanted to re-organize and make the police a more efficient instrument for the prevention and detection of crime (The Police Act, 1861). The Act was also believed to be enacted to place the Indian population under strict magisterial control of a unified police force (Kumari and Sharma, 2016, p.2).

In post-independent India, the imprint of the 1861 Act and the use of Police as a 'force' continued despite it becoming Indian Police Service[1] though there have been concerns regarding the efficiency, functioning and various other aspects related to Police administration in India.[2] This is reflected in the way Police has been envisaged to perform a number of functions over the years. A glance through The Model Police Act 2006 reveals the 'role, functions and duties' of police to be wide ranging from upholding and enforcing the law impartially to preserving public order, protecting internal security, protecting public properties, to preventing crimes to registering and investigating all cognizable offences and many more. Another important feature in this description of role

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[1] The Indian Police Service replaced the Indian Imperial Service in 1948, an year after India gained independence from British rule. It is the policing arm of the All Indian Services. It provides leaders and commanders to the state police in India. Its cadre can also be employed by the Union government in India. Though Police has been placed in the seventh schedule of Indian Constitution making it a 'State' subject but the central government can persuade the governments in different states of India to adopt changes in police administration as recommended.

[2] Many Commissions and Committees had been formed to suggest reforms required in Police functioning (Kumari and Sharma, 2016).

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Review Article

Role of Indian Summer Monsoon and Westerlies on glacier variability in the Himalaya and East Africa during Late Quaternary: Review and new data

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ABSTRACT

This paper presents a review of Late Quaternary climatic changes and glacier variability in the Himalaya and East Africa, focusing on the role of Indian Summer Monsoon (ISM), East African monsoon, and Westerlies monsoons. Multi-proxy studies which are based on five different archives (lakes, peat bogs, speleothems, marine sediments, and ice cores) including sixty-six records from India and nearby regions, particularly in the Himalaya and in addition to six archives from the equatorial Eastern part of Africa encompasses with high-resolution published and unpublished records for the last 50 ka BP. The proxy data is discussed towards REMO-ESM model Coupled Model Intercomprasion Project phase 5 (CMIP5 Project) results. Our results indicate that both Western Himalaya and East Africa had undergone mega-droughts from ~17.0–15.0 ka BP, and precipitation had increased during the Early Holocene (10.0–7.0 Ka BP) during the time span when the Westerlies dominated regions. The model results suggest that the Westerlies monsoon has significantly contributed to the Northwestern Himalaya and somewhat to a lesser degree to the Western Himalaya and lower solar insolation in the winters did support the glacier advance during the LGM. The time series from the proxy data are compared with glacier fluctuations in different valleys to understand the response of the aforementioned monsoon system including other forcing factors which drive these variabilities. The review results indicate that the Westerlies was the main driver of the climate and glacier fluctuations in Northwestern Himalaya during the Late Quaternary. The Early and Late Holocene glacier fluctuation was mainly controlled by Westerlies precipitation in Northwestern Himalaya and the ISM controlled the glacier fluctuations in the Western Himalaya during Late Quaternary.

1. Introduction

In the last few decades, a large number of researches have studied the monsoon variability in the Himalayan region based on mainly lake sediment archives, from the Indian Summer Monsoon (ISM) and mid-latitudes Westerlies dominated regions. Since the multi-proxy-based study of lake sediments and other archives provide a varied opinion about the monsoon variability which raises diverse questions, e.g., (1) does a similar pattern of climate variability exist throughout the Himalaya, (2) how importantly the ISM and Westerlies favor glacier health during the Late Quaternary, (3) how can we address the tele-connection of Indian ocean in past glaciation over East Africa and Central Himalaya, and (4) does the performance of paleoclimate modeling inter-comparison project (CMIP5) agree with paleo-archive records. In order to address these questions, we used a variety of archives (lakes, peats, speleothems, marine sediments, and ice cores), selected from the diverse region including 48 records from ISM dominated Himalaya and adjacent areas, 19 lakes/peat records from the Westerlies influenced sites and 6 archives from the equatorial eastern part of Africa (Figs. 1a-b, Table 1). Our research also presents the climatic history for last 11,000 cal BP year from Chandratal lake (32°29′43"N: 77° 36′48″E, elevation 4300 m) which is situated at the junction of mid-latitude Westerlies and ISM. The overall study also highlights the contribution of Westerlies and ISM in the advancement of

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Testing the reliable proxies to understand the mid-Holocene climate variability records from Chandratal lake, Western Himalayas

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A B S T R A C T

Chandratal lake (32°28′30.65″ N 77°37′1.42″ E) located at the junction of Indian Summer Monsoon and Westerlies in the Northwestern Himalaya give an opportunity to reconstruct climate variability over the last ~6300 cal yr BP. Here, we used multi-proxy (Amino acids, Biogenic silica, grain size and total organic carbon) to link climate change and organic burial during the mid-Holocene period. The proxy records captured the changes in monsoon patterns, linking with Holocene climate optimum (HCO) during the ~6344- 5821 cal BP. The sediment profile begins with a wetter and moist climate mostly from the terrestrial environment inputs, corresponding to the warm Holocene Climate Optimum (HCO) period (~6344 - 5821 cal yr BP). A stable condition of the geochemical proxies during ~5821-3780 cal yr BP reveals a shifting of a moisture source, catchment stability and cold/dry climate in correspondence with reduced precipitation.

The period from ~3780 to 2129 cal yr BP, follows a gradual increase of organic matter deposition and supported with an elevated atomic C/N ratio of 13.1 (mean value). Further association of organic matter with the coarser grain particles, suggesting a wetter climate from increasing runoff which is in correlation with the reinforcement of the precipitation during this time interval. From ~2129 to 696 cal yr BP, reduced precipitation/dry condition was observed with a shift in the autochthonous production of organic matter (C/N ratio of 8.91). Increase in BSi content suggests an ameliorated climate at this interval; however, the lower organic matter content (mean, 1.79%) and shift in the correlation of organic matter from coarse grains to finer grain size, suggesting little contributions from the terrestrial activities favouring the dry environment and abundant diatoms growth. The paleoenvironmental variations illustrate in the study is comparable to other findings recorded in the Himalayan region.

1. Introduction

Lake sediment offers a multi-proxy approach to reconstruct past climate variability. The Himalayas having several paleolakes can provide climate variability records of diverse timescales. The studies applied in the last few decades for the reconstruction of paleoclimate in the Himalayas were mainly focused on pollen proxies, magnetic susceptibility, stratigraphy and isotope analysis (Phadtare, 2000; Juyal et al., 2009; Trivedi and Chauhan, 2009; Rawat et al., 2012, Rawat et al., 2015a; Bali et al., 2015; Kumar et al., 2019; Lone et al., 2019; Misra et al., 2019; Sanwal et al., 2019). Application of proxies such as Biogenic silica (BSi), Amino acids (AAs) are needed to be documented, and only a few records are found from the Himalayan lake (Das et al., 2010; Menzel et al., 2013, 2015). Numerous lake sediment archives are used to understand the climate variability in north-western Himalaya (Leipe et al., 2014; Ali et al., 2020; Kumar et al., 2020).

AAs are widely used as a degradation proxy to understand the diagenetic status of organic matter and mainly focuses on marine sediment core (Dauwe and Middelburg, 1998; Dauwe et al., 1999; Jennerjahn et al., 1999; Keil et al., 2000; Davis et al., 2009; Kaiser and Benner, 2009). However it is essential to study individual lake, as AA indices differ considerably to lakes catchments and specific phytoplankton assemblage depending on the climate conditions (Menzel et al., 2013). The lake sediments are the major storehouse of AAs and act as an important sink, they are absorbed along with the suspended particulates that finally reach the lake floor and hence preserved by the following sediment layer (Ni and Wang, 2015). The discrimination in the utilisation of AAs by microbial activities (Burdige and Martens, 1988) and environmental changes affect the AA contents in sediments. AA plays a significant role in biogeochemical cycles (Bourgoin and Tremblay, 2010) and in deciphering the lake productivity that occurs in the environment. Total organic matter (TOC, TN) is also an indicator of the lake primary productivity and the inputs of organic matter from the catchment. Change in the BSi is often linked indirectly with the climate and environmental change, where a warm and wet climate is more favourable for the growth of the diatoms and vice versa (Liu et al., 2014). Therefore, a warm and wet climate will associate with an increase in grain size, BSi, and organic matter. We assume similar observation in the Chandratal and propose that the intensity of monsoon has the main influence of the sediment grain size. Recent study on Chandratal lake has

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दिनमान के सम्पादक और उनका योगदान

– मनीष चंद्र शुक्ल

'उदंत मार्तण्ड' पत्र की पहली संपादकीय में पं. युगल किशोर शुक्ल ने कहा था कि इस पत्र का प्रकाशन 'हिन्दुस्तानियों के हित हेतु' हुआ है। यह वाक्य स्वाधीनता संग्राम की भारतीय पत्रकारिता का प्राणतत्व था। इसी प्राण-पण की भावना से लोकनायक की भूमिका को आत्मसात करते हुए देश को आजाद कराया गया। हेरम्ब मिश्र ने 'पत्रकारिता : संकट और संग्राम' पुस्तक में पत्रकारिता के तीन मूल्यों की बात की है–विशाल मानव परिवार की एकता, जनसेवा सामाजिक और आर्थिक स्थिति में सुधार के लिए प्रयत्नशील रहना, शान्ति सेवा। (1. पत्रकारिता : संकट और संग्राम, हेरम्ब मिश्र- पृ. 2)

यदि देखा जाए तो स्वाधीनता बाद के कुछ दिनों तक पत्रकारिता ने इन मूल्यों को सँजोकर रखा। कारण कि उन दिनों की जो पत्रकारिता थी, उनमें साहित्यकार ही संपादक हुआ करते थे। जो पत्रकारिता में आने से पहले ही साहित्य में सक्रिय और मान्य होते थे। 'दिनमान' साप्ताहिक पत्र उन्हीं दिनों की ही परिकल्पना थी। आजादी के बाद हिन्दी पत्रिकाओं में 'दिनमान' का अपना आभामंडल था। 'दिनमान' अपनी राजनीतिक, सामाजिक और सांस्कृतिक विषयों पर की गई गंभीर वैचारिक और मौलिक टिप्पणियों के लिए आज भी याद किया जाता है। 'दिनमान' पत्रिका से हिन्दी साहित्य के शीर्ष हस्ताक्षर 'अज्ञेय', 'रघुवीर सहाय', 'सर्वेश्वरदयाल सक्सेना', 'धर्मवीर भारती' जुड़े तथा इसके माध्यम से पाठकों को प्रेरित करने के साथ, एक ऐसा पाठक वर्ग भी तैयार किया जो न सिर्फ पत्रिका को पढ़ता था बल्कि अपनी राय भी देता था। उनकी राय को दिनमान ने प्रमुखता से छापा भी।

अब आया सवाल कि 'दिनमान' के लिए अज्ञेय जैसे महत्वपूर्ण साहित्यकार का चयन क्यों किया गया? किसी बड़े पत्रकार का चयन क्यों नहीं? यह सवाल पत्रकारिता के सम्पूर्ण कलेवर को वर्णों कर देता है।

टाइम्स समूह की मालकिन रमारानी जैन की पहल पर टाइम्स समूह सांस्कृतिक पत्रिका, 'धर्मयुग' साहित्यिक पत्रिका 'सारिका', बच्चों की पत्रिका, 'पराग', फिल्म पत्रिका 'माधुरी' एवं खेल पत्रिका 'खेल भारती' निकाल रहा था लेकिन उसके पास समाचार और विचार प्रधान कोई पत्रिका नहीं थी। इसका विचार अमेरिका में प्रकाशित 'टाइम' जैसी पत्रिका हिन्दी में निकालने का था जो पूरी दुनिया की राजनीति, संस्कृति पर अपनी टिप्पणियों और रिपोर्टों के लिए जानी जाती है। रमारानी जैन जिनकी हिन्दी में काफी दिलचस्पी थी ने देशकाल निकालने में दिलचस्पी दिखाई लेकिन उन्होंने इसे संपादित करने के लिए एक लायक पत्रकार की माँग कर दी। तब इन्हीं लोगों ने अज्ञेय का नाम सुझाया।...टाइम्स ऑफ इंडिया समूह ने 'देशकाल' तो नहीं निकाला, लेकिन हिन्दी में 'टाइम' जैसी पत्रिका निकालने के विचार को

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रघुवीर सहाय और दिनमान

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रचनाएँ - पत्र पत्रिकाओं में रचनाएँ प्रकाशित।

रघुवीर सहाय बहुमुखी प्रतिभा के ऐसे कलाप्रेमी थे जो अभिव्यक्ति के विविध आयामों को साथ लेकर चले। उन्होंने कविता समीक्षा, कहानी, पत्रकारिता, मंचन आदि अनेक विधाओं में कार्य किया। साहित्य और कला की सभी विधाओं के अप्रत्यक्ष प्रभाव को ध्यान में रखते हुए रघुवीर सहाय ने पत्रकारिता को प्रत्यक्षीय प्रभाव के रूप में अंगीकार किया। संपादन और पत्रकारिता, इन दो रूपों में रघुवीर सहाय की विशिष्ट पहचान है। पत्रकारिता में आने से पूर्व रघुवीर सहाय के मन में समाज को एकदम से बदलने, कोई बड़ा परिवर्तन करने का पूर्वग्रह दिखावटी नहीं था। उनकी सोच थी कि जो कार्य किया जाए उसे पूरी शिद्दत से, परिश्रम से और अंत तक किया जाए। विष्णु नागर उनकी इसी प्रवृत्ति के बारे में लिखते हैं-

'उन्होंने कोई भी काम अधूरे, चलताऊ ढंग से नहीं किया। इसलिए रघुवीर सहाय की कल्पना और सर्जनात्मकता का फलक सिर्फ कविता से नहीं जाना जा सकता और उसे सिर्फ साहित्य का उत्कृष्ट नमूना मानकर सन्तोष नहीं किया जा सकता। उसे जानने के लिए उनके सम्पूर्ण रचनात्मक व्यक्तित्व में आवाजाही करनी पड़ेगी। (रघुवीर सहाय की पत्रकारिता दृष्टि -राजकुमारी रानी, पृ. 3)

रघुवीर सहाय ने 28 सितंबर 1969 को अज्ञेय के बाद 'दिनमान' को संपादन का दायित्व सँभाला। उनसे पूर्व 'दिनमान' की प्रतिष्ठा दिनमान में प्रकाशित आलेखों के कारण थी लेकिन उनके संपादक बनने के उपरांत दिनमान की पहचान बढ़ने लगी। ये इस बात का द्योतक है कि रघुवीर सहाय में संपादन और पत्रकारिता की कुशलता समाज और राष्ट्रीय चेतना के साथ-साथ जनप्रिय करने वाली भी रही। अज्ञेय के संपादन में शुरू हुयी 'दिनमान' पत्रिका समाचार और विचार दोनों का एक संतुलित रूप मानी जाती थी लेकिन रघुवीर सहाय के आने से 'दिनमान' का फलक समाचार और विचार से आगे बढ़ा।

रघुवीर सहाय ने राजनीति, साहित्य, कला, संस्कृति आदि विषयों के माध्यम से नये प्रतिभाशाली लेखक तथा पत्रकारों के साथ-साथ पाठक भी खड़े किए। अनेक चुनौतियाँ होने के बाद भी 'दिनमान' के माध्यम से उन्होंने हिन्दी पत्रकारिता के क्षेत्र में नित नये प्रयोग किए। उन्होंने पाठक और पत्रिका के मध्य एक ऐसा प्रगाढ़ संबंध स्थापित किया जो हिन्दी पत्रकारिता में एक मिसाल बन गया। उन्होंने 'दिनमान' के द्वारा भारत की आम जनता के साथ सामाजिक और लोकतांत्रिक रिश्ता कायम किया।

अज्ञेय जहाँ सांस्कृतिक घटनाओं पर जोर देते हैं वहीं रघुवीर सहाय ने समाज और राजनीति के विचारों को प्रमुखता दी। इसका कारण यह था कि उन पर राम मनोहर लोहिया के विचारों का प्रभाव प्रखर रूप से पड़ा। इस बात को रेखांकित करते हुए उमेश चतुर्वेदी और सुधांशु मिश्र लिखते हैं-

'लोहिया की समाजवादी-राजनीतिक चिंतनधारा से प्रभावित उनकी चिंताएँ आम आदमी

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Future Challenges for Emerging Educational Environment due to Covid 19 Lockdown

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Abstract

The Covid-19 or Coronavirus pandemic has changed millions of lives globally. It has impacted educational environment unprecedentedly. The education is integral component to the personal and societal growth. Closures of educational institutions have several implications as the schools are not only places of learning but ensure nutrition, safety and hope for the future. India's diverse and layered society has always required a strong public education system for universalization of education without any discrimination. Most of the institutions switched to the online mode of learning according to their resources and saved millions of learning days. However, faced with new realities it could be said that online educations has serious limitations as well. The pandemic has revealed the digital divide distinctly. It has also underlined the need of more public investment in education and better preparedness for uncertainties. The paper examines the unfolding educational environments based on the analysis of data retrieved from the global studies with a view to make the most of the situation and set new tone of development for the future.

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Covid -19,
Environment,
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Online Education

Introduction

The impact of Covid-19 is unprecedented and global, unlike the earlier crises which disrupted education in individual countries or regions. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO), more than 90 per cent of the world's students or 1.57 billion learners across 190 countries have been affected by the closures from pre-primary to higher education levels.[1,2] As a result, the students are temporarily forced to 'schooling from home' or got disconnected totally.

Closures of schools have serious impacts on the society as it is associated with deprivation of opportunities for growth and development and also results in poor nutrition, exploitations and drop outs of the students. The losses are even bitter for under-privileged learners. Although it is too early to judge, however, significant long term modifications in the teaching-learning process are expected ranging from the large scale digitization, innovation, and reprioritisation of subjects taught to the way the academic institutions function. A clear

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Corporate Governance And Indian Life Insurance Companies

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Abstract

Corporate Governance in life insurance companies is of paramount importance as they are the custodians of large public funds, which have to be prudently invested as per the mandatory requirements of the insurance regulators. This will not only increase the policyholders' trust and faith as well as ensure their continued loyalty. The IRDA had issued comprehensive Corporate Governance guidelines in 2009 as well as revised guidelines in 2016, which became applicable on Indian insurance companies from financial year 2016-17. The research paper explores the corporate governance guidelines being followed by the top five private Indian life insurers. The annual reports of ICICI Pru Life, SBI Life and HDFC Life, Max Life and Bajaj Allianz Life Insurance Companies for the period 2015-16, 2016-17, 2017-18, 2018-19, and 2019-20 have been analyzed. An attempt has been made to find out the attempt of these insurers in complying with these guidelines. It was found that reporting is done as per norms, existence of board committees, companies being awarded for excellence in financial reporting/ corporate governance. Thus, good reporting cannot be assumed that there is strict compliance and implementation of the regulations as well.

Key words: IRDAI, Corporate Governance, Private Life Insurance Companies, India

I. Introduction

The Cadbury Report (1992) defined Corporate Governance (CG) "as a set of relationships between a company's management, its board, its shareholders and other stakeholders".

According to The Institute of Company Secretaries of India "Corporate Governance is the application of best management practices, compliance of law in true letter and spirit and adherence to ethical standards for effective management and distribution of wealth and discharge of social responsibility for sustainable development of all stakeholders"

CG in life insurance companies is of paramount importance as they are the custodians of large public funds, which have to be prudently invested as per the mandatory requirements of the insurance regulators. This not only increases the policyholders' trust and faith as well as ensures their continued loyalty. The insurance companies are governed by various laws and regulations given by the Insurance Regulatory and Development Authority (IRDA) Act, 1999, Insurance Act, 1938, Companies Act 2013, and other guidelines issued from time to time by IRDA and various other statutes. CG is the system by which an insurer governs itself.

Growth Of Digital Insurance 2000 And Beyond

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Abstract

Before the year 2000, Insurers concurred that only a small category of products can be sold through the Internet. Forrester Research survey (1999) found that only 12 percent of insurers sell online and online sales accounted for only 2 percent of the overall market. In 1999 Booz Allen Hamilton study highlighted a very pessimistic view about digital insurance and gave ***three reasons for online Insurance faring badly.*** ***First*** *is product complexity and regulation.* ***Second,*** *insurance companies struggle with cost and complexity of Internet-based sales capabilities and* ***Third,*** *insurance companies are still very dependent on agents/brokers.* ***The growth of global online insurance was predicted to be slow and sluggish.*** *It was assumed that the developed countries would lead in online insurance sale while developing countries would lag behind. However, the findings show that the developed countries have been slow and reluctant in adopting digital platforms for purchase and sale of online insurance, on the contrary developing countries like India, and other south east Asian countries are generating a higher percent online sales of both life and nonlife insurance. Products like term insurance, motor and travel are being sold effectively through digital mode. The millennials' use of Internet, mobiles, smartphones and mobile apps is redefining their buying behavior as well as their insurance needs. These customers desire clear, transparent information; smooth, hassle-free claim process and ease of use without the interference of agents. In the year 2000 and much before it, a very few had even imagined that Internet, digital platforms, smartphones and mobile apps would redefine people's behavior and lifestyle. The insurance sector could vastly be benefitted by technology driven consumer behavior and digital business models, which will redefine the way insurance is bought and sold in the 21st century.*

Key words: *Growth, Digital Insurance, India, Globe, & customer expectations*

1. Introduction

In the year 2000 and much before it, the role of information technology for insurance business was almost non-existent. In India, there was no regulatory provision for use of alternate channels of distribution for selling insurance and there was greater dependence on sale through direct agents. In 1999 Booz Allen Hamilton study (1999) [1] highlighted a very pessimistic view about digital insurance and pointed out ***three reasons for online Insurance faring badly.*** **First** is product complexity and regulation. **Second,** insurance companies struggle with cost and complexity of Internet-based sales capabilities and do not expect cost reduction from building these capabilities. **Third,** these companies are still very dependent on agents/brokers and are therefore reluctant to offer online sales capabilities. Forrester Research survey (1999) [2] found that only 12 percent of insurers sell online. Online sales accounted for only 2 percent of the overall market. This study showed that 27 percent of the people surveyed would like to gather information on insurance products over the Internet. The customers believed they would get reliable advice on financial planning and insurance commitments. A.M. Best's Review/Preview (2000) [3] estimated that by 2004, personal and small

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Indian Women on Board: A Myth or Reality

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I. Introduction

As per the World Bank data 2019, women comprise 48 percent of the Indian population but there is only 26 percent participation of women in labour force as against a global average of 49 percent, making it one of the lowest in the world. In 2013, a World Bank study reported that only 27 percent, of the female population aged over 15 years is working in India. Gender Diversity Benchmark Asia report (2014) found that Indian women are poorly represented in corporate world and India ranked the lowest among China, Hong Kong, India, Japan, Malaysia and Singapore in terms of the average representation of women at different levels across multinational organisations. The average representation of women in the total workforce is 26.6 percent as against the regional average (RA) is 47.5 percent, while the female participation rate at senior levels are 10.6 percent (24.3 RA) respectively. In order to make women a part of the corporate boards, regulatory push has been made towards gender diversity through changes in the Corporate Act.

Globally, many countries are also struggling with gender diversity of the corporate boards. Europe tops the table with an average of 29.7 percent of women in board mainly due to policies and initiatives seeking to address gender diversity and inclusivity on supervisory boards. In North America female board representation has increased from 17.3 percent in 2015 to 24.7 percent. Malaysia, France, Australia, Germany, and Austria have seen the biggest proportional increase between 9.4 and 12.8 percentage points in boardroom diversity in 2015-2019.

European countries lead in appointing Women as Director on a Company's Board. Norway was the first country in the world to legislate gender representation on company boards. In December 2003 the Norwegian Parliament passed a new regulation that required at least 40 percent of each gender on company boards. The aim was to bring gender equality and to increase companies' profitability. The law came into force in the beginning of 2008, and major changes emerged in the corporate

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BRIEF RESEARCH REPORT
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Variation in Lifestyle-Related Behavior Among Obese Indian Patients With Non-alcoholic Fatty Liver Disease

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Lifestyle modification is the mainstay of treatment in Non-Alcoholic Fatty Liver Disease (NAFLD). Published Indian data on the diet and lifestyle of Indian NAFLD patients is scarce. This study explored variation in lifestyle-related behavior among obese patients with NAFLD. Ultrasonography (USG) diagnosed obese NAFLD patients ($n = 140$) were assessed for dietary intake [1-day 24 hours recall, food-frequency questionnaire (FFQ)] and physical activity (PA) [Global Physical Activity Questionnaire (GPAQ)]. Diet quality score (0–30) and physical activity (PA) levels were used to study variation in lifestyle and assess the effect of lifestyle on the severity of NAFLD. Compared to the recommendation, calorie consumption was 25.2% higher in nearly half (53.6%) of the subjects and mean macronutrient intake was imbalanced (60.3% carbohydrates, 12.4% protein, 25.5% fats). Variation was seen in terms of diet quality—good (3%), moderate (54.3%), or poor (43.5%) and intensity of PA—high (15%), moderate (47.9%), or low (37.1%). No patient had a combination of high PA and good diet quality within all grades of NAFLD. Our study suggests wide variation in lifestyles of obese patients with NAFLD and need for a more flexible and individualized modification of their diet and PA.

Keywords: NAFLD, obese, diet, physical activity, lifestyle, variation

INTRODUCTION

Non Alcoholic Fatty Liver Disease (NAFLD) is a major cause of liver disease and is strongly linked to a poor lifestyle. As high as 60% of individuals are affected by NAFLD and metabolic syndrome in the developed and developing countries (1). NAFLD is widely prevalent (9–35%) in urban as well as rural areas of India (2). Though not imminently fatal itself, it is associated with several co-morbidities like hypertension, atherosclerosis, heart disease, diabetes, dyslipidemia (3). Untreated NAFLD may progress to cirrhosis and hepato-cellular carcinoma (4).

Currently, lifestyle modification (leading to 5–10% weight reduction) remains the cornerstone of NAFLD treatment in patients. However, there is little consensus on particular diet options and strategies that may be most effective in the treatment of NAFLD (5). The current conventional wisdom is that obese patients with NAFLD are eating too

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Perceived barriers and facilitators for adherence to lifestyle prescription: Perspective of obese patients with non alcoholic fatty liver disease from north India

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ABSTRACT

Background and aims: This study aims to identify the barriers and facilitators faced by obese patients with NAFLD from north India, while undergoing lifestyle-modification.
Methods: 30 obese patients with NAFLD were interviewed regarding the barriers and facilitators to lifestyle change and responses were noted. Inductive thematic analysis was used.
Results: Eight themes under barriers (lack of family support, difficult intervention, work-related, financial, psychological, social, physical and infrastructure related) and four themes under facilitators (family support, intensive nature of intervention, psychological and physiological) were identified from the reponses.
Conclusions: Personalized and socio-culturally appropriate counseling strategies may promote successful treatment outcomes among these patients.

Introduction

Losing clinically significant body weight (7–10%) through lifestyle modification is the mainstay in the treatment of NAFLD [1], which sounds simple, but is difficult to achieve in 50% patients with NAFLD [2]. Factors acting as barriers and facilitators in weight loss intervention are bound to differ in different parts of the world because of socio-cultural and behavioral variation. There is a dearth of literature describing the experiences of Indian patients with NAFLD, particularly around making lifestyle changes. Studies from the west have identified certain barriers and facilitators [3] that may not be generalizable worldwide. This study aimed to explore the key factors that affect adherence to dietary and physical activity prescriptions targeting weight loss among obese NAFLD patients from north India.

Methodology

We conducted this qualitative study involving an in-depth interview by a dietitian using open-ended questions about barriers and facilitators for lifestyle change in 30 obese NAFLD patients evaluated in the Department of Medicine and Gastroenterology and Human Nutrition, All India Institute of Medical Sciences, (AIIMS) Delhi, between July 2018 to March 2020. The Institute ethics committee approved the study (IEC-434/04.08.2017).

Patients were asked questions about barriers and facilitators for lifestyle change and the responses were noted. Probing questions were asked wherever the responses were vague or incomplete. Inductive thematic analysis was used. The responses were read in detail by two authors independently (CA and AM), who identified a total of 39 barriers and 16 facilitators from these responses and coded them into themes and subthemes, using excel sheet. Third experienced author (PR) was approached to refine the framework and ensure consensus on themes and subthemes. Direct participants' quotes are reported to support themes and thus maximize conformability.

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Industrially produced trans fat: Usage, health implications, global and indian regulations

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Abstract

Global momentum is growing for the total elimination of industrially produced trans fats from the food systems as they are known to have deleterious health effects on various body functions particularly the cardiovascular health. Many developed nations such as Denmark have completely eliminated the use of industrially produced trans fats from the food supply. India is undergoing a significant nutrition transition that has substantially increased the intake of processed and ready-to-eat foods, abundant in trans fats. The Indian regulator-Food Safety and Standards Authority of India is all set to reduce the industrially produced trans fats to <2% by the end of year 2021 in a phased manner. Multiple strategies such as reducing trans fat limit in oils and fats, mandatory labeling on food products, introduction of "Trans-fat free" claim and logo have been adopted by the Indian regulatory body, to achieve the goal of trans fat free India. This review comprehensively summarizes from a public health perspective the usage of industrially-produced trans fats in Indian food industry, its effects on health, the global strategies to limit its content, and the current Indian regulations.

Keywords: Food Safety and Standards Authority of India, global regulations, industrially produced trans fat, mandatory labeling, trans fat free

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Indian Women on Board: A Myth or Reality

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I. Introduction

As per the World Bank data 2019, women comprise 48 percent of the Indian population but there is only 26 percent participation of women in labour force as against a global average of 49 percent, making it one of the lowest in the world. In 2013, a World Bank study reported that only 27 percent, of the female population aged over 15 years is working in India. Gender Diversity Benchmark Asia report (2014) found that Indian women are poorly represented in corporate world and India ranked the lowest among China, Hong Kong, India, Japan, Malaysia and Singapore in terms of the average representation of women at different levels across multinational organisations. The average representation of women in the total workforce is 26.6 percent as against the regional average (RA) is 47.5 percent, while the female participation rate at senior levels are 10.6 percent (24.3 RA) respectively. In order to make women a part of the corporate boards, regulatory push has been made towards gender diversity through changes in the Corporate Act.

Globally, many countries are also struggling with gender diversity of the corporate boards. Europe tops the table with an average of 29.7 percent of women in board mainly due to policies and initiatives seeking to address gender diversity and inclusivity on supervisory boards. In North America female board representation has increased from 17.3 percent in 2015 to 24.7 percent. Malaysia, France, Australia, Germany, and Austria have seen the biggest proportional increase between 9.4 and 12.8 percentage points in boardroom diversity in 2015-2019.

European countries lead in appointing Women as Director on a Company's Board. Norway was the first country in the world to legislate gender representation on company boards. In December 2003 the Norwegian Parliament passed a new regulation that required at least 40 percent of each gender on company boards. The aim was to bring gender equality and to increase companies' profitability. The law came into force in the beginning of 2008, and major changes emerged in the corporate

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Self-Attention GRU Networks for Fake Job Classification

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Abstract:- This paper analyses the Employment Scam Aegean Dataset and compares various machine learning algorithms including Logistic Regression, Decision Tree, Random Forest, XGBoost, K-Nearest Neighbor, Naïve Bayes and Support Vector Classifier on the task of fake job classification. The paper also proposes two self-attention enhanced Gated Recurrent Unit networks, one with vanilla RNN architecture and other with Bidirectional architecture, for classifying the fake job from real ones. The proposed framework uses Gated Recurrent Units with multi-head self-attention mechanism to enhance the long term retention within the network. In comparison to the other algorithms, the two GRU models proposed in this paper are able to obtain better result.

Keywords:- *Fake Job Classification; Text Classification; Gated Recurrent Unit; Recurrent Neural Networks.*

I. INTRODUCTION

21st century world is the world of data. There has never been more data available to humans at once than now. Data is available in various formats – texts, audios, videos, images, graphs and more. There was a time when reaching people or accessing things was not easy, but with the advent of internet everything has changed. People are one text or internet call (audio or video) away from each other irrespective of their geographical locations. Books, journals, news, recruitments-information regarding anything and everything was difficult to access earlier, again with internet, it has become easier to access data or such information. Within three decades of arrival of internet, we have moved from a time of not enough data to way too much data. With so much data available at once, we are at advantage. However, just as there is some bane associated with every boon, this availability of too much data also has some hidden issues. Especially when there is no validity of the data. With the advent of social media platforms it has become really easy to share information obtained from these data with people. However, this ease has brought a major issue with it. People can and do share information with other people without verifying it. An information that is not verified could pose some real threat to people using that data. For instance, a famous journalist in India thought she got a job to teach at one of the top ranked university in the world. She quit her job to accept this teaching position. However, later she got to know that the job offer that she received was fake and there was no teaching job for her. She had left her journalist job by then. This is just one such instance of people falling in the trap of fake or unverified information.

A large amount of data that we encounter is text based. Text data requires considering semantic as well as syntactic significance of words. With deep learning, Natural Language Processing (NLP) has accomplished great heights. It has empowered our machines to examine, comprehend and choose important contexts out of the compositions. Nowadays, Recurrent Neural Network (RNN) has come up as an empowering alternative to withstand the test of time not just on one but numerous text-based jobs.

Recurrent Neural Networks have been utilized for different applications like text classification [1, 2, 3, 4], speech recognition [5], language translation [6], image captioning [7], and various others. Speculatively, vanilla Recurrent Neural Networks show energetic common conduct for a time series task. However, Hochreiter [8] and Bengio et al., [9] proved that vanilla Recurrent Neural Networks are frail to dispersing or detonating slopes. To overcome this issue of frailing slope, Hoschreiter proposed Long Short-Term Memory (LSTM) in his 1997 paper [10]. LSTM is a combination of three gates namely input, forgets and output gates. The three gates together solve the issue of the slope. A more summarized adaptation of LSTM called Gated Recurrent Unit (GRU) was proposed in 2011 by Cho et al., [11]. Both the LSTM and GRU have been used in RNN architecture for various tasks and have resulted in many state-of-the-art results. Since GRU has only two gates instead of three as is the case with LSTM, GRUs are computationally faster than LSTMs.

The rest of the sections of this paper are structured as follows: Section 2 details about GRU cell and the use of GRU based RNN architectures for text classification. Besides this the section details about the calculation of self-attention weights. In section 3, we have given the details our models. Section 4 includes the details of datasets, implementations, results and the various observations that we have made based on the outcomes of our experiments. We conclude this paper in section 5.

II. BACKGROUND

A. Recurrent Neural Networks for Text Classification

Recurrent neural network is a sequential network in which output at each step is calculated as the function of its current input and the outputs obtained from the previous inputs. With the recent progression within the field of text classification utilizing RNNs, recurrent networks are being utilized for an assortment of errands. Irsoy et al., [12] in 2014, used RNN for opinion mining. Pollastri et al., [13], in 2002, used RNNs for estimating the protein secondary structure. Tang et. al., [14] did

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Identification of instruments for evaluation of behavioural and psychological parameters associated with obesity management: A systematic review with narrative synthesis of the findings

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ABSTRACT

Background and aims: To identify instruments used to evaluate the predictors of successful weight loss across weight loss trials.
Methods: We searched PubMed, PsychInfo, Cochrane Reviews and Scopus for weight loss trials reporting instruments published in the last 16 years.
Results: A total of 46 significant behavioral and psychological predictors were identified, of which 32 instruments were finally selected. *SF-36 questionnaire and Obesity Related Problem Scale* for psychosocial health, *TREMORE scale* for motivation, *Social* Support Scale for support, Weight Efficacy *Lifestyle Scale* for self-efficacy and *Body Shape Questionnaire* for body image had moderate quality. *Barriers to healthy eating questionnaire* scale and *Dutch Eating Behavior* also had moderate quality.
Conclusion: Use of uniform instruments with optimum quality can benefit clinical and community-based researchers to generate reliable datasets.

1. Introduction

Obesity is a public health disease in India. Obesity is a complex, multifactorial and largely manageable disease [1]. The primary assessment of individuals with obesity is imperative for research, planning and management to achieve significant weight loss [2]. Across the weight-loss trials, several instruments assess the underlying behavioral and psychological factors that can be manipulated during an intervention to achieve weight loss success [3].

Identification of uniform instruments can enable clinical and community-based researchers engaged in obesity related research in developing countries like India to obtain accurate data from the study participants and healthcare professionals and provide customised recommendations. In addition, the use of instruments with good methodological quality can help researchers to produce valid and reliable datasets which can be compared across weight loss trials from Indian and western literature. The improvement in availablility of a comprehensive list of good quality instruments can facilitate the obesity researchers to select appropriate instruments aligned with the goal of their research, available budget, participant burden and expertise. Considering the importance of instruments in obesity research and practice, little is published regarding the instruments to be used for the assessment of behavioral and psychological parameters associated with obesity management, especially in developing countries.

Most reviews on instruments for assessment of predictors can be categorised in two ways: (i) narrative reviews to collectively identify instruments for existing behavioral and psychological predictors and (ii) systematic reviews focusing on various

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Abbreviations

PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analysis
COSMIN	Consensus-based Standards for the Selection of Health Measurement Instruments
GRADE	Grading of Recommendations Assessment, Development and Evaluation
PROM	Patient Related Outcome Measures
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analysis
PROSPERO	International Prospective Register of Ongoing Systematic Reviews
BMI	Body Mass Index
GHQ	General Health Questionnaire
SF-36	36-Item Short Health Survey
TREMORE test	Treatment, Motivation and Readiness test
TSRQ	Treatment Self-Regulation Questionnaire
BSQ	Body Shape Questionnaire
WEL	Weight Efficacy Lifestyle Questionnaire
TFEQ	Three Factor Eating Questionnaire
BHE	Barriers to Healthy Eating
LOPAR	Low Level Physical Activity Recall
GSES	General Self-Efficacy Scale
ESES	Eating Self-Efficacy Scale
PASE	Physical Activity Self-Efficacy Scale
OP Scale	Obesity Related Problem Scale
DEBQ	Dutch eating behaviour Questionnaire
CA	Cronbach's alpha
ICC	Interclass correlation coefficients
PSS	Perceived Stress Scale

instruments used for assessing a single predictor. Both these methods present their limitations. Narrative reviews rarely focus on methodological quality of identified instruments [4]. On the other hand, only a few systematic reviews discuss the methodological properties of instruments used to measure a single construct (*such as self-efficacy, motivation and body image*) related to weight loss success [5]. There are no reviews that systematically identify the instruments for assessment of behavioral and psychological predictors and synthesise a narrative analysis on their methodological properties. This review was planned to provide researchers a concise and easy to use list of available instruments for assessment of behavioral and psychological factors associated with obesity management.

The aims of the present systematic review were: (i) to systematically identify studies measuring significant predictors of successful weight loss outcome and the instruments used therein and (ii) to produce a narrative analysis on the methodological properties of the identified instruments.

2. Methodology

The drafting of the manuscript was based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement and COSMIN (Consensus-based Standards for the Selection of Health Measurement Instruments) checklist. The methodology is recorded in PROSPERO (International Prospective Register of Ongoing Systematic Reviews: CRD42020191594). The review was planned in two phases: (i) Phase I for systematic identification of studies reporting significant behavioral and psychological predictors and instruments used therein and (ii) Phase II for a narrative synthesis on measurement properties (*mainly validity and reliability*) of the identified instruments. Behavioral predictors are defined as dietary, activity and sleep related habits and/or action exhibited by an individual. Psychological predictors are defined as underlying psychological mechanisms that may have significant influence on certain actions/habits for weight management. All definitions of the measurement properties are given in Supplementary Table 1 [6].

2.1. Phase I: systematic identification of instruments to measure biological and psychological factors

2.1.1. Literature search

Four electronic databases: Scopus, PubMed, PsychInfo and Cochrane were searched to identify pertinent articles published between September 2005 and September 2021 (16 years). Investigators developed a search string: (questionnaire* OR scale* OR instrument* OR tool) AND ("behavioral factor" OR "psychological factor" OR barrier* OR facilitator* OR predictor* OR determinant*) AND (lifestyle OR behavior* OR diet* OR "physical activity" OR intervention) AND ("weight loss" OR "weight management" OR "obesity management") after discussion, referring to identical literature, and identifying relevant indexing terms to retrieve existing articles. In addition, a lateral search using references list and cited literature of primary articles was also done.

2.1.2. Inclusion and Exclusion Criteria

Inclusion Criteria: Studies on adult participants (>18 years) undergoing lifestyle modification, using valid and reliable questionnaires and scales, and published in English language peer-reviewed journals were selected.

Exclusion Criteria: Studies recruiting participants with chronic or psychiatric illness, pharmacological and surgical intervention and reporting only significant biological (biochemical assay, anthropometric parameters etc) or genetic predictors associated with weight loss were excluded. Studies using unvalidated questionnaires and/or surveys were excluded.

2.1.3. Study selection

All the articles selected through keyword search were screened according to titles and abstracts to eliminate all irrelevant and duplicate studies by authors SC and AM. The remaining articles were read in full text to categorise the studies as: (i) 'included' (fulfilling inclusion criteria), (ii) 'exclude' (not fulfilling the inclusion criteria) and (iii) 'unclear' (studies with disagreements after independent review). Disagreements on the unclear articles were sought out by third-party adjudication (authors AK and PR). Finally, all the selected articles were included in the PRISMA flow chart for narrative synthesis as shown in Fig. 1. The included studies were read thoroughly to provide information on significant predictors and identify the instruments used to measure these predictors.

2.1.4. Data extraction and synthesis

Data were independently extracted by one author (SC): author, publication year, study design, intervention characteristics, behavioral and psychological predictors, instruments used for assessment of significant predictors. Author AM reviewed all the extracted data for correctness and completeness.

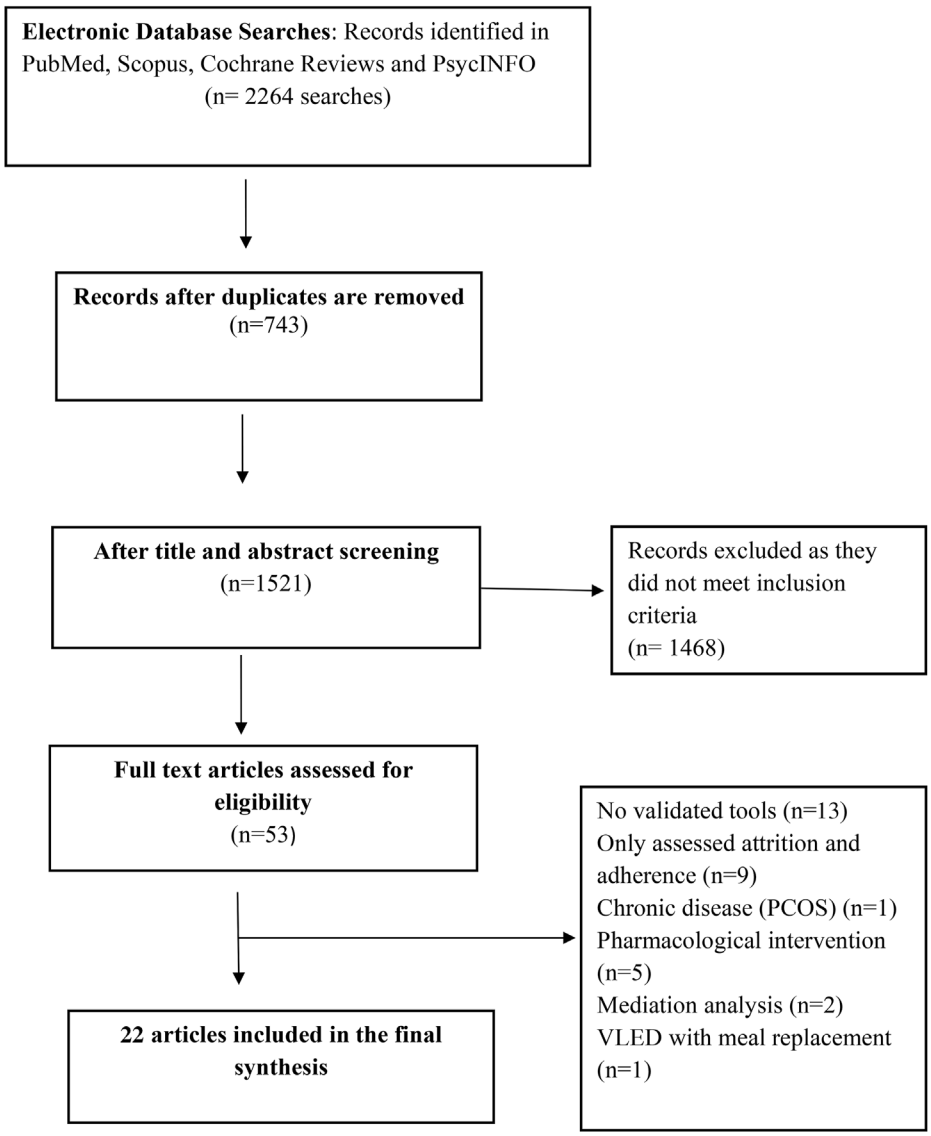

Fig. 1. Prisma flowchart.

2.2. Phase II: narrative synthesis of measurement properties

Using lateral search, the measurement properties of the identified instruments were taken from original development and validation studies mentioned in the reference list of these primarily included studies. Authors SC and AM also referred to primary development and validation study (if and when available) to identify instrument's characteristics to extract the following information: study population, number of domains and items in the final instrument, type of response scale, and administration time. The measurement properties including internal consistency, reliability and structural validity, construct validity and responsiveness were also extracted.

2.2.1. Risk of bias assessment for measurement properties

The risk of bias assessment for measurement properties of instruments was done by authors SC and AM using the COSMIN checklist [6]. The COSMIN checklist evaluated the quality of instruments to categorise them as: very good, adequate, doubtful, or inadequate quality.

Four steps were followed to evaluate the quality of the instrument using the COSMIN checklist: (i) identifying the measurement properties assessed in the study; (ii) understanding of statistical methods used for assessing the measurement properties; (iii) evaluating the properties according to COSMIN-checklist items; (iv) grading of each property on the basis of its quality (very good to inadequate). Finally, the methodological quality for a property (e.g. internal consistency) corresponded to the least rating given to an item in the COSMIN-checklist for that section. For example, if an item on the COSMIN-checklist for internal consistency was rated poor, whereas all other items were rated as good, then the final quality for internal consistency was classified as poor [7,8].

3. Results

3.1. Identification of significant psychological and behavioural predictors

Of 2264 studies identified, 22 eligible studies were selected, as shown in Fig. 1 (PRISMA). The data extracted from these studies is

presented in Table 1. Studies were either randomized control trials (RCTs) (n:13) or intervention studies (n:9) on middle-aged adult participants with obesity (Body Mass Index (BMI) < 30 kg/m^2). Successful weight loss outcomes were defined as achievement of clinically significant weight loss in thirteen studies, baseline weight change in seven studies [12,15,21,22,26,30] and percentage weight change in two studies [10,29]. A total of 46 significant predictors were identified under psychological and behavioral domains [4,12–16,18,21–23,25,29,30].

3.2. Identification of instruments for assessment of predictors

A total of 32 instruments were identified (Table 1). Of these, 22 (67%) instruments were in the psychological domain and 10 (30%) in the behavioral domain as per the construct measured.

3.2.1. Psychosocial instruments

A total of 22 questionnaires were identified measuring different psychological constructs related to weight loss. The general health and quality of life was assessed using four measures: G*eneral Health Questionnaire (GHQ)* [29], *36-item Short Health Survey (SF-36), 12-item short form health survey* [19] *and Obesity Related Poblem Scale (OP Scale)* [18]. Only two measures assessed both physical and mental components of health: *12-item short form health survey* and *SF-36 Survey* [19]. A detailed assessment of psychological adjustment, somatic symptoms, and negative mood states were assessed using 28-item *GHQ* [29]. Moreover, the impact of obesity and its associated complication on everyday psychological and social wellness was assessed using the *OP Scale* [18].

Baseline assessment of readiness and the motivation to initiate weight loss intervention was assessed using *Treatment, Motivation and Readiness test (TREMORE test)* [17,20], whereas different sources of motivation (autonomous, intrinsic or extrinsic) were assessed using *Treatment Self-Regulation Questionnaire (TSRQ)* [11] and *Intrinsic Motivation Inventory* [30]. Another study assessed appearance related motives for initiating weight loss in women using *Motivation for weight loss scale* [10]. Issues with body image were assessed using *Body Image Assessment* [18] and *Body Shape Questionnaire (BSQ)* [30]. Some studies also assessed other psychological factors such as distress using *PHQ-9* [18] and *Perceived Stress Scale* [16] and personality traits using *Big Five Personality* [24].

In intervention studies, *Palatable Motives Scale* was used to assess factors *like coping and reward enhancement* responsible for deviation from dietary advice [9]. Studies assessed an individual's self-efficacy to lose weight using *Weight Efficacy Lifestyle Questionnaire (WEL)* [11] and efficacy to follow corrective eating and exercise behavior using an *Adapted Confidence Questionnaire* [22] and *Self-efficacy for Exercise Behavior Scale* [30]. Only one study assessed the confidence to stick to a low-fat healthy diet using *Low Fat Dietary Restraint Scale* [23]. In addition, social support by family and friends to maintain corrective eating and activity behaviour was measured using *Coping Inventory sub-scale* [28].

3.2.2. Behavioral instruments

Behavioral instruments assess baseline eating and activity behavior during intervention. Three studies used *Three Factor Eating Questionnaire (TFEQ)* to evaluate participants' food preferences and perceptions of hunger, satiety and restraint [15,21,27], whereas only one study assessed restrain using a subscale of *Dutch eating behaviour Questionnaire (DEBQ)* [23].

Interviewer assisted, *24-hour recall* was used to assess participant daily intake of foods and beverages and subsequently to calculate calorie, macronutrient and micronutrient intake [13]. Twenty four hour recall was also used in combination with *Healthy Eating Index-2010* to assess the diet quality. The deterrants faced by participants for adherening to healthy eating pattern were assessed using *Barriers to Healthy Eating (BHE)* with subscales including emotional challenges (e.g. limited resistance to unhealthy food), daily tasks of following a healthy diet (e.g., foods availability and accessibility), and support (e.g family preferring high calorie food) [13,14]. Caloric expenditure through physical activity was also assessed using recall measures.

Leisure related physical activity as a predictor was measured by two recall measures: (i) *Stanford 7-day activity recall* measuring total daily energy expenditure [18], (ii) *36-item Community Health Activities Model Program for Seniors Questionnaire* [16] collecting data on frequency and duration of physical activities in a typical week. Contrary to active behavior, sedentariness was assessed through: (i) *Sitting Questionnaire* measuring total and domain specific sitting time for weekdays and weekends [12], (ii) *Low Level Physical Activity Recall (LOPAR)* measuring weekly activity (home, occupational, and leisure) as MET hour/week [23].

3.3. Measurement properties of instruments: a narrative synthesis

Instruments' measurement properties were identified from primary development and validation studies identified during lateral search (shown in Supplementary Table 2). A total of eight measurement properties were assessed: internal consistency, reliability, structural validity, hypothesis validity, cross cultural validity, responsiveness, criterion validity and measurement error. Most instruments had three established measurement properties: internal consistency (19 instruments), reliability (15 instruments) and hypothesis testing (14 instruments) [31,33–35,37,38,42,44–46,48,51–53]. No study reported content validity. The maximum number of measurement properties were reported by *PHQ-9* (collects data on depression) [44] followed by *OP Scale* [43]. Instruments like Adapted Confidence in Eating and Exercise Behavior, Body Shape Questionnaire, Intrinsic Motivation Inventory and *LOPAR* had only one established measurement property [49,54,55].

Instruments determined internal consistency by evaluating Cronbach's alpha (CA). A CA $\geq$ 0.70 was established for all the instruments, except *Intrinsic motivation Inventory's* subdomain assessing pressure and tension (CA: 0.68) [55]. Instruments reported reliability as Interclass correlation coefficients (ICC)/Spearman's or Pearson's correlation coefficient (r). Most of the measures had ICC/r $\geq$ 0.70, except *TFEQ subscale* (r: 0.40, r:0.43) [37], *PSS* (r: 0.50) [39] and *Fat Related Dietary Questionnaire* (r: 0.34 to 0.57) [47]. Structural validity ranged from 15.3% (*Appearance to oneself subscale, Motivation for weight loss scale*) to 73% (*Big Five Questionnaire*) [32,50]. Hypothesis testing for construct validity was established by comparing instruments assessing related or unrelated constructs or subgroups. The correlation for a majority of the instruments was between 0.30 and 0.50 indicating good construct validity, except *Social* Support subdomains including positive comment (r: 0.19) and encouragement (r: 0.27) [41]. Only *TREMORE scale* examined concurrent validity by AUC curve with the cut-off point as 3.07 (which is more than 0.70) [40].

3.4. Quality of measurement properties of instrument: risk of bias assessment

The quality of included instruments' measurement properties is presented in Supplementary Table 3. Most instruments had very good internal consistency and structural validity, but adequate (*PSS, TREMORE*) or doubtful (*Motivation for weight loss scale, PHQ-9*) quality of reliability. Only the *Social* Support S*cale* and *OP Scale* had a very good quality of reliability. Amongst psychological instruments, *SF-36 questionnaire*, *OP Scale*, *TREMORE, So*cial Support

Table 1
Studies to identify the instrument for measurement of the predictors of success weight loss.

Study (Year, Country)	Study design, Methodology and Outcome	Patient characteristics	Significant predictor of weight loss	Instrument	Remarks on characteristics of instrument	Domain \measured
1. Sylvester et al., 2019 (U.S.) **(9)**	Intervention Study 6 month of EatRight Lifestyle (ERLS) program ≥5% weight loss	N = 312 A- 46.7 ± 11.2 BMI − 41.43 ± 9.4	Conformity and Reward Enhancement (P < 0.05)	**Palatable Eating Motives Scale (PEMS)**	SA Construct: Frequency of palatable food consumption 20-items measuring 4 domains: Coping, Reward Enhancement, Social, and Conformity motives on a 5-point likert scale	**Psychological**
2.Mroz et al., 2018 (U.S.) **(10)**	RCT, Women Weigh-in for Wellness project *Percentage weight change*	N = 301 A- 53.94 ± 6.88 BMI -34.8 ± 4.21	Negative predictor Appearance to self (P = 0.02)	**Motivation for weight loss scale**	SA 24 items measuring 3 domains: Health related reason, appearance to self, appearance to others on a 4-point likert scale	**Psychological**
3. Kerrigan et al., 2018 U.S. **(11)**	Intervention study Standard behavioral treatment ≥10% weight loss	n = 283 Age-53.2 ± 9.7 BMI-35.1 ± 4.8	Amotivation (P < 0.05) Negative emotion (P < 0.05)	**Treatment Self-Regulation Questionnaire (TSRQ)**	15-items measuring 4 domains: Autonomous motivation, external motivation, introjected motivation and amotivation on 7-point likert scale	**Psychological**
				Weight Efficacy Lifestyle Questionnaire	SA 20 items measuring Negative emotions, social pressure, availability, physical discomfort, and positive activities on 10-point likert scale	**Psychological**
4.Morgan et al., 2018 Australia **(12)**	RCT, SHED-IT Lifestyle modification Weight change from baseline	N:159 men A- 47.5 BMI-32.7	Less sitting time non- work day (P = 0.046) workdays (P = 0.03)	**Sitting Questionnaire**	SA, Interview 5 domains Traveling; At work; At leisure; Watching television; Using a computer at home	**Behavioral**
5.Zheng et al., 2016 U.S. **(13)**	RCTs: PREFER and SMART Standard Behaviour Treatment ≥5% weight loss	N:338 A- 45.7 ± 9.0 BMI -33.9 ± 4.3	Less barriers to healthy eating (P < 0.01) Reduction in consumption of fat (P = 0.01)	**Barriers to Healthy Eating (BHE) Scale** **24 h dietary recall**	Interviewer, SA 22 items measuring 3 domains:Emotions, Daily Mechanics of Healthy Eating and Social Support Construct: Usual Dietary Intake	**Behavioral** **Behavioral**
6. Wang et al., 2015 (U.S.) **(14)**	RCT, Behavioral weight loss intervention Change in baseline weight	N: 210 A- 46.8 ± 9.0 BMI- 34.0 ± 4.5	BHE total score (P < 0.001) Emotions subscale (P < 0.001) Daily Mechanics domain (P < 0.001) Social Support domain (P = 0.01)	**Barriers to Healthy Eating (BHE) Scale**	Interviewer, SA 22 items measuring 3 domains:Emotions, Daily task to follow a Healthy Eating, Social Support on 5-point likert scale	**Behavioral**
7. Urbanek et al., 2015 (U.S.) **(15)**	RCT, Calorie restricted diet Weight Change	N: 60 A 35.9 ± 5.8 BMI- 31.0 ± 4.3	Increase in cognitive restraint of eating score (P < 0.0001)	**Three Factor Eating Questionnaire**	SA 51 item measuring 3 domains: Cognitive Restraint, Disinhibition,	**Behavioral**

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Table 1 (*continued*)

Study (Year, Country)	Study design, Methodology and Outcome	Patient characteristics	Significant predictor of weight loss	Instrument	Remarks on characteristics of instrument	Domain \measured
					Hunger on 4-point likert scale	
8.Kyryliuk et al., 2015 (U.S.) **(16)**	RCT, Faith, Activity, and Nutrition (FAN) program Behavioral lifestyle intervention ≥5% weight loss	N:257 A- 56.1 ± 12.0 BMI-33.6 ± 7.6	Baseline stress (P = 0.04) Leisure time physical activity	**Perceived Stress Scale** **Community Health Activities Model Program for Seniors (CHAMPS)**	SA 4 items on stress with 5-point likert scale response SA/Interview Frequency and duration Leisure related activity Measured as hours per week	**Psychological** **Behavioral**
9. Rotella et al., 2014 Italy **(17)**	Prospective observational study Behavioral Lifestyle modification ≥5% weight loss	N: 70 Age- 44.7 ± 12.7 BMI -39.3 ± 6.9	Higher TREMORE score (men) (P < 0.05)	**Treatment, Motivation and Readiness test (TREMORE)**	Interview 35 items measuring 3 domains: Desire to overcome obstacle, Taking care of oneself and problem sharing , Current lifestyle on 5-point likert scale	**Psychological**
10. Yank et al., 2014 U.S. **(18)**	ELITE RCT Lifestyle intervention ≥5% Weight loss	N: 72 Age- 55.0 ± 10.8 BMI-31.9 ± 5.2	Greater social support (P = 0.068)	**Social support for Diet** **Social support for Exercise**	SA 36 items on Positive comment, Encouragement, Sabotage measured on 5-point likert scale SA 29 items on Exercising together, participation and involvement and reward and punishment measured on 5-point likert scale	**Psychological** **Psychological**
			Lower obesity-related problems (P = 0.02)	**Obesity Related Problem Scale**	SA Construct: Psychosocial functioning 29 items measuring five domains: physical functioning, self-esteem,public distress, sexual health, and work on 4 point likert scale	**Psychological**
			Physical well-being (P = 0.05)	**12-Item Short-Form Health Survey [SF-12]**	Construct: Well being 12 point sub scale for physical component	**Psychological**
			Lower depression symptoms (P = 0.04)	**Depression-Patient Health Questionnaire [PHQ-9]**	SA Nine depression symptoms on 4 point likert scale	**Psychological**
			Less body size dissatisfaction (P = 0.02) Leisure time activity (P = 0.03)	**Body Image Assessment** **Stanford 7day Physical Activity Recall**	– Administered via Interview schedule	**Psychosocial Behavioral**
11.Karlsen et al., 2013 Norway **(19)**	Prospective cohort study Lifestyle intervention ≥5% weight loss	Age-45.2 ± 11.1 BMI-42.0 ± 6.2	Mental HRQL (P = 0.033)	**Short form of the Medical Outcome Study (SF-36)**	SA 14 items measuring four domains: Psychological well being, Anxiety, depression, loss of behavioral or emotional control	**Psychological**
12.Cresci et al., 2013 Italy **(20)**	Lifestyle intervention ≥5% weight loss		Higher Baseline TREMORE (P = 0.05)		Interview schedule 35 items measuring 3	**Psychological**

		N: 331 Age-43.2 ± 11.9 BMI -38.8 ± 6.8		**Treatment, Motivation and Readiness test (TREMORE)**	domains: Desire to overcome obstacle, Taking care of oneself and problem sharing, Current lifestyle on 5-point likert scale	
13. Batra et al., 2013 (U.S.) **(21)**	RCT, Lifestyle intervention program Weight change	Intervention group n = 74 A: 49.09 ± 10.12 BMI-33.48 ± 6.47 Control group n = 21 A: 49.84 ± 10.98 BMI- 33.12 ± 6.61	Change in Hunger (P = 0.002)	**Three Factor Eating Questionnaire**	SA 51 items measuring 3 domains: Cognitive Restraint, Disinhibition, Hunger on 4-point likert scale	**Behavioral**
14.Wingo et al., 2013 (U.S.) **(22)**	RCT Lifestyle modification Weight Change	N = 537 A:50 ± 8.9 BMI- 33.2 ± 5.9	Decrease in dietary self efficacy ($P < 0.01$) Decrease in Exercise self efficacy ($\beta = -.19$, $P < 0.01$)	**Adapted from Eating Habits Confidence Questionnaire Cronbach's α:0.89**	SA 27 items measuring 5 domains: Resisting relapse Reducing calories, salt and fat Behavioral skills on 5-point likert scale	**Psychological**
				Exercise Confidence Questionnaire Cronbach's α:0.89	SA 12 items measuring 2 domains: Resisting relapse Making time for exercise on 5-point likert scale	**Psychological**
15. Delhanty et al., 2013 (U.S.) **(23)**	RCT Lifestyle intervention ≥7% weight loss	N: 274 A: 50.6 ± 11.3 Mean weight-94.1 ± 20.8 kg.	Greater exercise self-efficacy (OR = 1.60; P ≤ 0.05)	**Weight Efficacy Lifestyle Questionnaire**	SA 20 items on Negative emotions, social pressure, availability, physical discomfort, and positive activities measured on 10-point likert scale	**Psychological**
			Greater dietary restraint (P ≤ 0.01) Lesser high-fat dietary behaviors (P ≤ 0.01)	**Restraint subscale of Dutch Eating Behavior Questionnaire**	SA 10 items measuring 3 domains: Attitudes toward weight, frequency of dieting, weight fluctuation on 5-point likert scale	**Behavioral**
				Fat-Related Diet Questionnaire	SA 22 items measuring 3 domains: Excluding high-fat ingredients, Modify high-fat foods, substitution, replacing high-fat foods with low-fat on 5-point likert scale	**Behavioral**
			Greater sedentary activity level (P ≤ 0.05)	**Low Level Physical Activity Recall (LOPAR)**	Interview 7-day recall Hours spent on very light, light, moderate, heavy activities	**Behavioral**
16.Munro et al., 2011 (Australia) **(24)**	RCT ≥5% weight loss	HEWLD: n-22 Age- 41 ± 3 BMI- 32.3 ± 2.6 VLED: n-32 Age- 42 ± 2 BMI- 32.9 ± 3.2	Neuroticism (P < 0.01)	**Big Five questionnaire**	SA 180 items measuring 6 domains: Neuroticism, Conscientiousness, Extraversion, Openness Agreeableness on 5 points likert scale	**Psychological**

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Table 1 (*continued*)

Study (Year, Country)	Study design, Methodology and Outcome	Patient characteristics	Significant predictor of weight loss	Instrument	Remarks on characteristics of instrument	Domain \measured
17.Svetkey et al., 2011 (U.S.) **(25)**	RCT: Behavioral intervention ≥5% weight loss	N = 1685*	Lower social support at baseline (P < 0.001)	**Social Support for exercise**	SA 13 item measuring Exercising together, participation involvement and reward and punishment on 5-point likert scale	**Psychological**
				Social Support for Eating Behavior	SA 18 items on Positive comment, Encouragement, Sabotage on 5-point likert scale	**Psychological**
			Higher healthy eating index (P ≤ 0.001)	**Healthy Eating Index (HEI)**	Construct: Dietary Quality Food group rated on frequency of consumption for ten food group Calculated	**Behavioral**
18. Akter et al., 2010 (U.S.) **(26)**	3-week calorie restriction: Meal replacement Portion control Weight change	N = 32 Age = 31.68 ± 12.98 y) BMI: 34.99 ± 3.22	PFS-food tasted scores ($P = 0.03$)	**Power of Food Scale**	SA Construct: Living in a food abundant environment: psychological impact 15 items measuring 3 domain: food available, present, tasted on 5-point likert scale	**Psychological**
19. Grave et al., 2009 (U.S.) **(27)**	Longitudinal Study ≥5% weight loss	500 Age: 46.2 ± 10.8 BMI: 37.3 ± 5.6	Dietary Restraint (P < 0.001) Changes in disinhibition (P < 0.003)	**Three Factor Eating Questionnaire**	SA Construct: Dietary Behavior 51 items measuring 3 domains: Cognitive Restraint, Disinhibition, Hunger on 4-likert scale	**Behavioral**
20. Conradt et al., 2009 Germany **(28)**	Longitudinal Lifestyle Intervention study >4% weight loss	N = 98 A: 47.7 ± 12.3 BMI: 36.7 ± 5	Problem focused disengagement (P < 0.01)	**Coping Strategies Inventory–Short Form**	Interview Construct: Coping Behavior 32 items measuring 8 domain: problem solving, express emotion, cognitive restructuring, social contact, problem avoidance, wishful thinking, self-criticism, social withdrawal on 4-point likert scale	**Psychological**
21. Anton et al., 2008 (U.S.) **(29)**	RCT Calorie restriction intervention Percentage weight loss	N = 36[γ]	GHQ scores (P < 0.001)	**General Health Questionnaire**	Interview Construct: Psychological health 28 items on Psychological adjustment, somatic symptoms, negative mood states on 4-point likert scale	**Psychological**
22. Texiera et al., 2006 (Portugal) **(30)**	Longitudinal study Lifestyle Intervention Weight Change	N = 136 A: 48.1 ± 4.4 BMI: 30.6 ± 5.6	Self efficacy for exercise (P < 0.001) Exercise motivation (P < 0.002)	**Self-efficacy for exercise behaviors scale** **Intrinsic motivation inventory (IMI)**	SA Construct: Self-efficacy 12 items measuring 2 domains: Making time,	**Psychological** **Psychological**

		resisting relapse on 5-point likert scale SA Construct: Motivation 16 items measuring 4 domains: Interest/ enjoyment, competence, effort/importance and pressure/tension 7-point likert scale	
	Body shape questionnaire	SA Construct: Experience of feeling fat 34 items measured on 6-point likert scale	**Psychological**
Body shape concerns ($P < 0.001$)			

Footnote: A: Age (years); N: Sample size; BMI: Body Mass Index (kg/m^2); SA: Self Administered; B: Baseline; FU: Follow up; RCT: randomised Control Trial; ELITE: Elevated Cardiometabolic Risk In Primary Care; DPP: Diabetes Prevention Program; HRQL: Health Related Quality of Life; DASH: Dietary Approaches to Stop Hypertension.

Scale, Weight loss efficacy and *BSQ* had an overall moderate quality.

In the behavioral domain, instruments assessing eating behavior had a very good quality of internal consistency. *BHE scale* and *PFS scale* had very good quality of construct validity. Only *Stanford's Seven Day Activity Recall* had good structural validity and reliability. All physical activity recall measures had an overall low quality. Eating behavior instruments such as *BHE* and *DEBQ* had an overall moderate quality.

4. Discussion

The use of valid, reliable and uniform assessment instruments in obesity management can help clinical and community-based researchers to generate reliable datasets that can be compared across diverse population groups to draw robust conclusions [56]. This review focuses on systematically identified instruments previously used in literature to assess behavioral and psychological predictors and provide a narrative synthesis on their measurement properties, mainly reliability and validity.

4.1. Tools for assessment of predictors of weight loss success

Most instruments were self-administered tools with Likert-scale response but varied in complexity and length. Measurement properties such as internal consistency, reliability and construct validity were commonly assessed.

4.1.1. Psychological instruments

The inverse relationship between quality of life and obesity is well established. In literature, instruments for assessment of quality of life are described as generic (focusing on broad measures of health such as *SF-36 survey*) or condition-specific (focusing on information most pertinent to disease groups like *OP scale*). *SF-36 survey* is extensively used in clinical practice and epidemiological studies to evaluate eight domains across physical, mental and social health parameters [57,58]. Previous reviews suggest that *SF-36* can be coupled with *OP Scale* to assess psychosocial impact of obesity. We also found that the *OP scale* is a robust and condition specific instrument to detect the negative impact of weight gain on psychological functioning in different social settings, intimate relationships and community activity, compounding to an overall poor mental well-being [59].

At baseline, a patient's self-motivation is the key to initiate weight loss. We found that a screening tool *TREMORE-test* can assess self-motivation by examining a patient's desire to overcome obstacles (*OD sub-scale*), openness to social support (*TS subscale)* and current lifestyle (*CL subscale*). An important finding was that the total-TREMORE scores were predictive of successful weight loss outcomes (>5%) after a 6-month intervention. Participants scoring higher on *TREMORE* and *OD sub-scale* have greater probability to lose significant weight [40].

Amongst most individuals attempting weight loss, the motivation to reduce weight is affected by peer acceptance and the aesthetic value associated with body image [60]. We found *BSQ (34-items)* as a valid instrument to assess distress related to body image, especially with a construct of 'feeling fat' in individuals with obesity. Several short form versions of *BSQ* have been derived in different languages with good internal consistency, validity and reliability.

During intervention, compliance to behaviors that support weight loss is dependent on an individual's self-efficacy and social support from family and friends. Self-efficacy is an individual's belief that they are capable of making the desired change to achieve expected outcome [61]. In our review, *Weight loss Efficacy (WEL) Scale* was found as a robust instrument to assess an individual's

efficacy to incorporate behavior that supports weight loss. Participants' weight loss success is shown to correlate with overall improvement in *WEL* pre-to-post treatment scores indicating good external validity [36]. Other self-efficacy scales can range from generic (such as: *General Self-Efficacy Scale*) to domain specific (such as: *Eating self-efficacy scale* or *Physical Activity Self-Efficacy Scale)*. It becomes important to note that self-efficacy is highly domain specific, i.e. a high sense of efficacy in one domain (e.g., healthy eating) does not translate to another domain (e.g. physical activity) [4].

A consistent social support or lack thereof has been recognized to impact an individual's weight loss behaviors [62]. We found the *Social Support Scale for eating and activity behavior* as good quality, valid, and reliable instruments. Social support scale scores correlate with an individual's dietary and activity habits, indicating good convergent validity [43]. Another study by Kiernan et al. reported that social support subscales predicted therapeutically significant weight loss in women with obesity undergoing lifestyle interventions [63].

4.1.2. Behavioral instruments

4.1.2.1. Eating behavior. It was observed that eating behavior such as hunger and restraint was most commonly assessed across weight loss trials. Other dietary habits such as meal frequency, portion size, eating out behavior, and sugar-sweetened beverage consumption were only assessed as a part of *24-hour dietary recall method*. In our review, dietary restraint was measured by *DEBQ.* The instrument measures an individual's level of self-restraint from consuming energy dense foods. It has the sensitivity to measure dietary restraint in different interventions (caloric restriction, lifestyle modification, self-management), population groups (Italian, Polish, German) and age categories (adolescents and adults) [64–67]. The difficulty an individual experiences in managing diet was assessed using *BHE* scale. In weight loss trials, the scale is used broadly in two ways: (i) to assess an individual at risk for obesity and allied chronic disease and (ii) customisation of a lifestyle intervention by addressing the barriers [68]. The domains assessed by these instruments are knowledge, motivation, environmental resources, health and functional status etc.

4.1.2.2. Physical activity. In our review, physical activity was assessed using low quality recalls as the recall measures were not validated in populations with overweight and obesity. Another critical review on physical activity tools reported that these instruments can only be used as activity ranking systems, since most individuals overestimate their daily activity [69] Objective tools such as heart rate monitors or accelerometers should be opted to measure the daily caloric expenditure.

In addition to optimum measurement quality, clinicians and researchers should also take into account factors such as scope of the tool, accessibility, feasibility, number of administrations, time of administration, ease of administration and participant burden before opting for a tool to collect data for predictors of weight loss success.

4.2. Limitations

For the ease of comprehension and understanding, only instruments measuring significant predictors associated with significant weight loss outcomes were included in this review. Quantitative studies published in English language were included. The assessment of biological predictors such as biochemical assays, anthropometric measurement and genetic markers were not in the scope of this review. In addition, the narrative synthesis was based on a single psychometric study of the identified instruments.

4.3. Implications and future research

To our knowledge, this is the first review which identifies significant predictors associated with successful weight loss outcomes and the instruments used to evaluate them. In addition, a narrative synthesis on the methodological quality of the instruments was carried out. Tools with moderate quality can be used by upcoming clinicians and public health researchers from India for baseline assessment of individuals with obesity seeking treatment and/or participating in weight loss trials. The researchers can elaborate on the findings of this review by: (i) analysing different methodological properties, (ii) comparison between existing instruments for the same predictor, and (iii) assessment of instruments in different population groups (*for example:* children, adolescent and adults).

Declaration of competing interest

The authors declare no conflict of interest.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.dsx.2021.102350.

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Designing and Conducting Randomized Controlled Trials: Basic Concepts for Educating Early Researchers in the Field of Clinical Nutrition

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Abstract

Randomized controlled trials (RCTs) provide the best quality evidence to steer patient care in the field of clinical nutrition. However, designing and conducting an RCT, analyzing data, interpreting and reporting its findings is rather complex for young researchers working in the field of clinical nutrition. This review article attempts to educate early researchers by offering a simple step by step guide on planning the key aspects (randomization, allocation concealment, blinding, outcome measures) of a trial, and highlighting the practical considerations (ethical clearance, trial registry, patient recruitment, trial monitoring) to be kept in mind while conducting a trial contextualised to clinical nutrition settings.

Categories: Medical Education, Nutrition
Keywords: clinical nutrition, dietitians, research design, randomized controlled trial, evidence based practice

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Introduction And Background

Randomized controlled trials (RCTs) generate the best quality of evidence in clinical nutrition practice and play an instrumental role in validating any nutrition/lifestyle intervention [1]. The practice of evidence-based nutrition has created a huge demand for well-designed and systematically performed trials in the field of clinical nutrition.

Conducting nutrition and lifestyle intervention trials is challenging as it involves several interacting components and requires rigorous evaluation to assess the effectiveness of such trials [2]. Registered dietitians, postgraduate nutrition students, dietitians and young faculty in the field of clinical nutrition science often lack the desired training and exposure to conduct clinical trials. Moreover, they are burdened with a high load of indoor as well as outdoor patient counseling, leaving them little time to focus on designing and conducting research. The academic departments of Nutrition and Dietetics, especially in low and medium income countries, find it difficult to conduct enough clinical trials due to lack of research related practical training of young nutrition faculty, poor infrastructure and lack of research support systems like free access to biostatisticians and poor interdepartmental mentorship at an institutional level. As a result, very few cross-cutting high-quality landmark clinical trials have been published from these countries, despite the huge scope and need for evidence-based clinical nutrition interventions in these nations [3].

This article attempts to introduce the basic concepts of planning and executing nutrition and lifestyle interventions to early nutrition researchers and dietitians, through a very simple and step by step approach.

Review

Nutrition and lifestyle based clinical trials: what and why?

An RCT is a quantitative, comparative and a controlled experimental study in which the researcher allocates people at random to receive one of several clinical interventions and then observes its effect on a pre-decided clinical outcome. Clinical trials are performed with a purpose of assessment of efficacy, safety, or risk benefit ratio. The goal may be superiority, non-inferiority, or equivalence [4]. Different types of trials with relevant examples are listed in Table *1*.

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Type of trial (treatment groups)	Example
A new intervention to a standard one	Trial comparing an Intensive Lifestyle Intervention to Diabetes Support and Education in overweight and obese diabetes patients to assess the progression of cardiovascular disease with time [6].
A new intervention to a placebo	Double-blind, placebo-controlled RCT to compare the effect of dietary supplementation containing ginger, green tea and capsaicin on metabolic profiles and weight loss among overweight women [7].
Already existing interventions with each other	Trial to determine the effect of a healthy low-fat vs a healthy low-carbohydrate diet on weight change [8].

TABLE 1: Type of trials

Nutrition and lifestyle-related trials can be very different from drug trials. Designing a lifestyle intervention trial using an optimal study design and data analysis and interpretation methods is a challenge. Lifestyle interventions are more complex in nature and require individualization as per the participants. Low rate of recruitment, high loss to follow up and issues of non-adherence are more common in nutrition and lifestyle-related trials. As compared to drug trials, these need rigorous monitoring and evaluation [5].

Are RCTs a suitable design for your clinical nutrition research question?

Before planning an RCT, a researcher should assess if the published studies suggest that the dietary intervention under question might be beneficial or not, along with checking the feasibility, ethical concerns and availability of resources to conduct the RCT. A young researcher should conduct a systematic literature search to find the available evidence before framing the research question for the RCT and also take the views of experts and mentors on the relevance of the RCT that is being planned. In scenarios where an RCT is unlikely to provide a conclusive answer, it is best to choose some other designs such as case control or cohort study designs, etc. Only when evidence from other study designs suggests that an intervention might be effective, an RCT should be planned to generate stronger evidence.

Part I: planning an RCT

It is suggested that one-third of the total time of the RCT study must be spent on detailed planning [9]. Some key points to consider while planning an RCT are:

1. Writing a Detailed Protocol Based on a Hypothesis

A detailed protocol outlining all components (research question, hypothesis, study design, primary and secondary objectives, sample size, selection of participants, outcome measures, statistical analysis) is instrumental to conduct an RCT [10]. Some checklists such as CONSORT [11] and NICE [12] are available which may act as a template to guide researchers in developing a sound protocol. Components of a good protocol include:

a) A clear title, hypothesis and objectives: The title of the RCT should be accurate, short and concise. It should preferably include all components of the PICOT (Population, Intervention, Comparator, Outcome and Time frame) format [13]. Use the SMART (Specific, Measurable, Attainable, Relevant & Time bound) criteria [14] to design a clear hypothesis. While writing objectives for a lifestyle intervention, it is very important to be sure if the research is trying to measure the “efficacy” (how the intervention performs under ideal/controlled circumstances) or the “effectiveness” (how the intervention performs under real world conditions) of the intervention. Clear demarcation of primary and secondary objectives is also important. The primary objective is the ultimate objective for which an RCT is planned and the sample size is calculated to answer the primary objective with adequate power.

b) Target population, selection criteria and sample size: Identify the target population on whom the results of the study will be generalized and a statistically significant impact of the intervention is feasible and likely. Selection criteria must 1) not be too strict 2) be aligned to the primary outcome 3) avoid possible confounding factors 4) optimize the effectiveness of active treatment 5) ease the recruitment and 6) consider the chances of non-compliance to treatment and loss to follow up [15]. Demographic details such as age and gender, duration and intensity of disease and medical history are some basic considerations while setting up the entry criteria.

For sample size calculation, it is advisable to involve a statistician to know the minimum required sample to show statistically significant results in the trial. Trials with an inadequate sample size may lead to waste of

resources as well as misleading conclusions.

c) Details of control and intervention group: Include at least one control group to demonstrate that the intervention is superior/inferior/equivalent to the standard practice. A control group discriminates outcomes caused by the intervention from those caused by other factors, such as natural progression of disease, patient expectations, or other treatments [16] as both the intervention and control groups are equally matched using randomisation. A weakly designed control group may lead to misinterpretation of results in an RCT.

It is important to clearly define the intervention you want to test in the trial. In case of lifestyle interventions including modifications in dietary and exercise behaviour, it is crucial to have a standard operating procedure that clearly states the mode of administration and duration of the intervention, any run in period required, tactics to be used for recruitment and adherence to protocol, and a timeline for follow up measurements and monitoring of intervention.

d) Trial design: Trial design optimizes and economizes the trial conduct. Three commonly used trial designs for examining the effects of dietary interventions are parallel, crossover and factorial study designs.

In a parallel trial (classical clinical trial approach), one group receives only treatment A while another group receives only treatment B. The two treatment arms can be two completely separate treatments or simply different doses of the same treatment. Generally, a placebo/active control is used as control groups in parallel studies. The parallel study design allows testing multiple interventions at the same time, which leads to shorter study duration [17].

The crossover study design is carried out in two phases. In the first phase, one study arm receives treatment A and the other arm receives treatment B. The assigned treatment to each arm is interchanged in the second phase, after a washout period. Participants in crossover studies act as their own control. It is not advisable to use crossover trials in studies where the outcomes may reverse in a short time span (e.g., weight loss) or carryover for a long time (e.g., change in hepatic fat content) [18].

In a factorial study design, which is commonly used in studies with dietary supplements and nutraceuticals [19,20], each participant is randomly allocated to a combination of two or more interventions. Using a factorial study design, it is possible to evaluate the effects as well as the additive, opposite or collective interactions of multiple treatments simultaneously, using just one study. The most commonly used approach is the 2 × 2 factorial design approach involving two interventions at two levels each. It is a potentially more informative and efficient approach since it allows evaluation of multiple intervention components with good statistical power. The major concern with this study design is the interaction of interventions, which often complicates interpretation of treatment effects.

e) Precise and measurable outcomes: A limited number of clinically significant outcomes should be defined, giving details on how, when and by whom will the outcomes be measured. The outcome measures selected must be ones that can be measured accurately and precisely [21]. Continuous outcome variables that can have any value between specified intervals (for example weight, height, age) over dichotomous outcome variables (for example - Are you a vegetarian? - Yes or No) increase the power of a study, permitting a smaller sample size. Several outcome measures can be used to evaluate different aspects of the results, including the adverse effects of the intervention.

f) Methods of randomization and stratification: Randomization prevents selection bias and ensures that any observed differences between the treatment groups are due to differences in the treatment alone and not due to the effects of any known or unknown confounding factors. Well-designed RCTs determine the method of randomization in advance. All aspects of randomization such as type of randomization (Table *2*), researcher involved in randomization, the timing of randomization and existence of a randomization register should be mentioned in the study protocol. Randomisation depends upon two important aspects; adequate generation of the allocation sequence (using computer-generated sequences, random numbers tables, drawing of envelopes) and concealment of the allocation sequence until assignment occurs using sequentially numbered, sealed, opaque envelopes.

Type of Randomization	What is it?	Features	Example
Simple Randomization	Randomization based on single sequence of random assignments Example- flipping a coin	Simple and easy to implement Results can be problematic in relatively small sample clinical research as it may lead to unequal number of participants in both the groups	Toss of coin or roll of dice
Block Randomization	Randomization done to select and divide participants into different groups or conditions in order to avoid selection bias	Suitable for smaller trials to ensure equal numbers in each group	Block randomization of two treatment groups A and B Number of blocks = 3, size of blocks = 10, and fixed size blocks. BLOCK 1- 1: A 2: B 3: B 4: A 5: A 6: B 7: B 8: A 9: B 10: A BLOCK 2- 1: A 2: B 3: B 4: B 5: A 6: B 7: A 8: A 9: B 10: A BLOCK 3- 1: A 2: B 3: B 4: A 5: B 6: A 7: B 8: A 9: A 10: B
Stratified Randomization	Randomization that involves the division of a population into smaller sub-groups known as strata. The strata are formed based on members' shared attributes or characteristics such as income or gender	Ensures that a potential baseline confounding variable is equally distributed between the two groups.	In case of assessing results of a weight loss intervention on patients, stratification can be done on the basis of Body Mass Index (BMI), education status, gender, socio economic status etc. After stratification, simple randomization is applied to each stratum to assign subjects to either group.

TABLE 2: Types of Randomization

g) Blinding: Blinding is done to hide the critical information on treatment allocation from patients, investigators or the evaluator in the study. This ensures that there are no differences in the ways in which each group is assessed or managed, and therefore bias is minimized [22]. The term “double blinding” is used when both the investigator and the study participants are not aware of treatment assignments. However, double blinding is not feasible in many nutrition and lifestyle trials such as the Look AHEAD trial of weight loss for the prevention of cardiovascular disease in type 2 diabetes [6]. Blinding of the study participants, their families and researchers involved in outcome assessment is not easy in lifestyle interventions because of active involvement of the participants in the intervention. For example, if a participant has been put on the Mediterranean diet along with a specific exercise regimen, they would know that they have been subjected to that intervention. The best possible option at times is to not tell the participants which is the active treatment arm and which is the comparator arm.

h) Plan for statistical analysis: A basic plan for statistical analysis should be formulated right at the planning stage, with the help of an experienced statistician. It should be planned whether data will be analysed on an intention-to-treat (ITT) or per-protocol (PP) basis. In ITT, every patient randomized to the study must enter primary analysis, whether or not they were compliant, early drop out or received an intervention outside of the study protocol. PP analysis only counts those patients who completed the study as specified in the protocol. PP analysis thus identifies a treatment effect that would occur under optimal conditions. The patients who choose to withdraw from the study/deviate from the protocol may differ in characteristics from those who completed the study as specified [23]. Withdrawal of the patient might be due to treatment being not effective and that is a disadvantage of per protocol. The ITT approach is generally preferred, as it maintains the advantages of randomization.

i) Realistic timelines: The protocol must contain a schematic diagram to efficiently present the overall schedule and time points for assessment in each group of the trial. Set realistic timelines, starting from initial eligibility screening until the study closes.

2. Getting Ethical Approval From the Institutional Review Board

Get the protocol reviewed and approved by the appropriate Ethics Committee (EC) at the institute where the study will be carried out, prior to the initiation of the trial. Details of some important considerations are listed below:

a) Informed consent: Disclosure, voluntariness, comprehension and competence are crucial aspects of an informed consent form. Informed consent has two parts: Patient Information Sheet (PIS) and Patient Informed Consent Form (PICF). The PIS must clearly indicate the nature, duration, potential benefits and risks involved in the study. The informed consent documents must be written in a language that is familiar

to the participant and is easy to comprehend. Researchers must make sure that the participants have properly understood the various components of the informed consent before signing it.

b) Clinical trial registry: All trials involving human participants, for any intervention including nutrition and lifestyle interventions, need to be registered prospectively on platforms such as the Clinical Trials Registry - India (CTRI), International Standard Randomised Controlled Trial Number Register (ISRCTN), clinicaltrials.gov, etc., before enrolment of the first participant. A registration number is allotted to the trial after registration, which is required to be reported while publication of the trial in any reputed journal. This open access registry allows the research community as well as the study participants to refer to the trial methodology when required. Some medical journals publish RCT protocols also to ensure that no modifications are done in the protocol according to trial results [24].

c) Insurance of the trial: The study protocol should contain a finance and insurance section that provides details of insurance coverage for treatment and compensation of trial-related injuries [25]. All intervention studies require an adequate insurance policy that can protect the investigator and patient from any harm resulting from participation in the clinical study.

PART II: conducting an RCT

The trial should be done absolutely in line with the protocol. Participants in both arms should be treated exactly the same way except for the intervention/control treatment, making sure that no undue testing is done on the patients in the trial.

a) Collection of baseline measurements: Use well-established tests/instruments to measure all variables. It is best to collect data as continuous variables, wherever possible. Focus should be on parameters that have the potential to objectively show the influence of intervention on the outcomes. The researcher who collects the outcome data should be blinded to the treatment allocation of the patients, to reduce the risk of bias while collecting the data.

b) Recruitment of participants: Randomize each study participant to the different treatment groups, after opening the sequentially labelled, sealed and opaque envelopes. The principles of confidentiality should be observed, and such recordings/related documentation should be preserved.

c) Follow-up and outcome assessment: Both the treatment and control group must be followed up as per the demand of the protocol, with assessment of outcomes in accordance with the time points and schedule set at the time of protocol development. The challenge here lies in reducing the loss to follow up and making sure complete data is taken from all participants without missing any important data. To reduce loss to follow up, it is important to keep the intervention easy and keep the study visits comfortable and well organised for participants. Also, select subjects who have better chances for adherence to the intervention. Plan screening visits before randomization to exclude participants who would not be able to complete the required visits [26]. Try to establish good rapport and frequent contact with subjects to maintain good adherence and reduce loss to follow up. Prefer non-invasive methods for data collection as far as possible. Test results that are of interest to the participants should be provided to them along with required interpretation and appropriate counselling.

d) Monitoring the trial: This step ensures quality control and helps maintain ethical standards. All staff involved in the trial must be monitored, trained and motivated regularly to ensure that study procedures and data handling is being carried out as planned in the protocol. The consumption of nutraceuticals, dietary supplements or a particular diet may cause adverse effects that should be adequately monitored and investigated. A group of clinicians and biostatisticians form the data monitoring committee in a clinical trial. They are appointed by study sponsors to provide independent assessment on the validity, safety and integrity of the trial. Such committees are generally needed in trials that assess novel interventions and can have a major impact on clinical practice [27].

A number of challenges associated with the planning and monitoring of RCTs and their possible solutions are summarised in Table *3*.

S. No	Challenge	Possible solutions
1	Unclear hypothesis and multiple objectives	Use the PICOT method (Population, Intervention, Comparison, Outcome and Timeframe) to state your research hypothesis. Avoid having too many objectives in a trial. Opt for one primary and few secondary outcomes.
2	Inefficient entry criteria	Balance the pros and cons of selecting very strict versus very lenient selection criteria.
3	Irrelevant and non-significant interventions	Choose interventions that would be feasible and practical in relevant clinical settings.
4	Ineffective randomization, stratification and blinding	Record and log all methods of randomization and randomization attempts. Stratify to prevent imbalances especially in small studies. Always blind outcome assessors to treatment allocation.
5	Insufficient sample size	Involve an expert statistician since the planning phase of the trial to avoid mistakes in sample size calculation.
6	Low recruitment and loss to follow up	Account for refusal to consent in the beginning. Anticipate crossover between control and intervention arm, loss to follow up and recruitment rate of below 50%, to maintain power of the study.
7	Failure to use Intention to treat analysis	Everyone who begins the treatment should be considered part of the trial to avoid misleading biases.
8	Quality control	Use a standardized operations manual for all procedures. Develop user-friendly and clearly formatted data collection forms, focusing only on relevant data.

TABLE 3: How to tackle the challenges associated with conducting RCTs?

RCT: randomized controlled trial

e) Interim analysis: Pre-planned interim analysis by independent statisticians is helpful in early assessment of efficacy as well as safety of the nutrition/lifestyle interventions. It can be described as the evaluation of trial data before the recruitment is complete to allow for any changes to be made in the ongoing trial. Standard operating practices, research integrity, regulatory concerns and scientific reasoning must be maintained while planning to conduct an interim analysis.

f) Analysis and interpretation: Statistical analysis should be carried out as planned in the protocol. Estimate the intervention's effect on all pre-decided study outcomes. Report the statistical significance and magnitude of effect on the outcomes. It is crucial to report the statistical tests to show no difference in key characteristics between both groups at the baseline. Analysis should be done to check whether loss to follow up created differences between the two groups during the intervention period.

Conclusions

To summarize, RCTs are the gold standard in evidence-based nutrition practice to establish causal relations between exposure to diet/nutrients and pre-decided outcome measures, such as anthropometric or biochemical parameters. This review aims to educate young nutrition graduates and dietitians about the basics of planning and executing trials to claim the efficacy/effectiveness of nutrition interventions, while maintaining ethical and scientific integrity. Addressed in this document are specific aspects of planning (drafting a research question, creating a hypothesis, determining primary and secondary objectives, selection of participants, randomization, blinding, deciding outcome measures and statistical analysis) and conducting (recruitment of participants, data collection, follow ups and outcome assessment, monitoring of the trial, analysis and interpretation of results) a nutrition-based trial, along with focus on additional important topics such as ethical considerations, clinical trial registry and trial insurance.

Additional Information

Disclosures

Conflicts of interest: In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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Weight management in postpartum women - An Indian perspective

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ABSTRACT

Background and aims: This narrative review is intended to present an evidence and opinion-based weight management module for Indian postpartum women to be used by clinicians.
Material and methods: Electronic databases such as PubMed and Google Scholar were accessed to extract relevant studies to derive evidence-based information. The reference list of the extracted studies was also checked to obtain further relevant articles. The opinion-based information was achieved from the consensus among the gynaecologists, nutritionists and doctors from Medicine according to their practical experiences in real time. In this review, we have used the term "postpartum" to represent the time period of two years after delivery.
Results: A postpartum weight management module consisting of information about diet, physical activity, sleep and breastfeeding was devised to be used in regular clinical practice, particularly in the Indian settings.
Conclusion: Postpartum women deal with various unique challenges as compared to other population groups. Individualised weight management strategies should be adopted to facilitate sustainable postpartum weight management.

1. Introduction

Postpartum obesity is a significant global public health challenge which is largely attributed to biological, psychological, and nutritional changes during pregnancy and lactation [1]. At commencement of pregnancy, around 15–20% of women are obese worldwide [2]. During pregnancy nearly half of these women (47%) gain excessive gestational weight above the range recommended by the Institute of Medicine (IOM) [3]. In first year of postpartum period, nearly one-fifth of women retain an average of 1–5.5 kg of weight [4]. Moreover, around one-fourth of women gain more than 2.25 kg of weight in their late postpartum period (12–24 months) [5]. In India, the overall prevalence of postpartum obesity is 13%, with the prevalence of over 40% in 37 districts; comparable to the national prevalence of obesity according to National Family Health Survey (NFHS)-4 data [6]. Postpartum weight retention (PPWR) and weight gain not only pose a risk for subsequent pregnancies but are also related to hyperlipidemia, insulin resistance hypothyroidism and cardiovascular risk in later life [1].

Many postpartum women try to achieve their pre-pregnancy body weight, however, approximately three-fourth of them fail to return to their pre-pregnancy weight one year postpartum [7]. It is quite a challenge to manage the postpartum weight as these women are generally saddled with tasks related to maternal and child care as well as the work and home responsibilities which leave little scope for them to initiate weight loss [8]. Those who initiate self-management of weight, usually do so without any clinical guidance and without approaching any postpartum clinics offering weight loss services. A plethora of information is available for weight management for the general population in India [9–12], however, this narrative review aims to specifically explore the burden and predictors of postpartum obesity, deliberate on the

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challenges and devise an evidence-based and consensus-based user-friendly postpartum weight management strategy that provides clinical and dietetic practice-related solutions, particularly in the Indian context. In this review, we have used the term "postpartum" to represent a time period of two years after delivery.

2. Implications of postpartum weight changes

Higher pre-pregnancy body mass index (BMI) and gestational weight gain (GWG) during pregnancy predispose women to increased risk of gestational diabetes (GDM), pre-eclampsia, complications during labour and delivery as well as PPWR [13]. PPWR and further weight gain can lead to short-term maternal complications such as reduced breastfeeding [14], nutrient deficiencies [15,16] and long-term metabolic complications such as elevation in blood pressure and LDL-cholesterol, reduction in HDL-cholesterol, increased risks of ischemic heart disease, hypertension, stroke and type 2 diabetes [17].

The condition further worsens when majority of these women are unable to return to their pre-pregnancy BMI; this leads to inter-pregnancy weight gain resulting in adverse outcomes in successive pregnancies and beyond [17]. This vicious cycle of increased obesity and body fat deposition continues affecting health of these women adversely. These facts underscore the need to identify various predictors of postpartum weight changes.

3. Available evidence: In Indian context

Ample evidence is available worldwide about various aspects of postpartum obesity such as predictors [18,19], challenges [20,21] and weight management [22–25]. However, India has a unique social and cultural make-up; and postpartum period has always been given much emphasis across various cultures in India. Unlike west, it is not a private affair, instead, the whole family, especially female relatives are also involved [26]. During this period, the mother is supposed to rest and rejuvenate. She is not allowed to do any household chores or indulge in any kind of activity. Moreover, the family and relatives pamper the mother usually by feeding her high calorie foods in excess amounts. Sedentary lifestyle in adjunct to the excessive calorie intake may subject these women to postpartum obesity [1,26].

A literature search for postpartum obesity in India was conducted using the following keywords: Postpartum, Post-pregnancy, Obes*, Weight gain, Weight retention, India, Asia. This resulted in the extraction of five Indian studies [6,27–30] presented in Table 1. These studies are not representative of the whole country except the study by Chopra et al. [6], as they have been conducted in only a few parts of India. There is paucity of Indian data underscoring the need to conduct more studies nevertheless, the available evidence has been used in this review to highlight the predictors, challenges and management of postpartum obesity in Indian settings.

4. Predictors of postpartum weight changes

Weight changes during the postpartum period are the result of various modifiable and non-modifiable variables (Table 2) [31]. Non-modifiable predictors include socio-demographic variables whereas modifiable predictors comprise behaviour related variables including diet and physical activity. However, obstetric variables can be either modifiable or non-modifiable depending upon the time of encounter with the women. The potential predictors of postpartum weight changes are briefly discussed below:

4.1. Socio-demographic variables

The trajectory of weight changes during the postpartum period is affected by various socio-demographic variables. Factors such as higher maternal age, urban residency, increasing wealth quintile and higher educational status are associated with higher PPWR and/or weight gain among Indian women [6]. Race (such as Asian, Hispanic and Black American) has also found to be associated with higher PPWR/weight gain [8].

4.2. Obstetric variables

Obstetric variables have a significant impact on the weight status of postpartum women [19]. These can be categorised as modifiable and non-modifiable depending on the stage of initiation of weight management measures. Non-modifiable obstetric variables include age at menarche, age at first delivery, parity, pre-pregnancy BMI, and GWG; whereas breastfeeding is a modifiable obstetric variable for postpartum women.

Non-modifiable obstetric factors: Early menarche and lower age at first delivery are associated with an increase in body weight [32,33]. However, evidence on the association of number of deliveries with postpartum weight changes is rather inconclusive as some studies highlight multiparous women to be at higher risk of obesity [34,35] whereas others report primiparous women [36,37]. Further, lower pre-pregnancy BMI, higher pre-pregnancy waist circumference, and higher GWG have been reported as risk factors of PPWR [19].

GWG has been widely studied as the strongest predictor for postpartum weight changes. Higher GWG is associated with greater postpartum weight in women from all BMI categories [38]. The IOM recommends GWG between 12.5 kg and 18 kg for women having BMI less than 18.5 kg/m^2 (underweight women), 11.5–16 kg for women with BMI between 18.5 and 24.9 kg/m^2 (normal-weight women), 7–11.5 kg for overweight women (BMI, 25.0–29.9 kg/m^2) and 5–9 kg for women having BMI 30 kg/m^2 or higher (obese women) [39]. Women gaining excessive gestational weight than recommended tend to retain more weight in their postpartum period than their counterparts gaining adequate gestational weight [19].

Modifiable obstetric factors: Exclusive breastfeeding for the first six months is highly recommended to women across the world. It is crucial not only for the growth of the infants but also beneficial for maternal health [40]. The visceral and femoral fat built up during pregnancy gets mobilised as a source of energy for milk production during breastfeeding [41]. Evidence supports that breastfeeding leads to reduction in PPWR and prevents further weight gain in all but the heaviest women [42]. Not continuing exclusive breastfeeding for the first six months postpartum may lead to higher PPWR [18]. Accompanying lactation with behavioural variables such as reduced energy intake and increased physical activity may further augment weight loss.

4.3. Behavioural variables

Behavioural variables such as diet and physical activity are among the essential determinants of PPWR and weight gain. Postpartum period is generally associated with increased calorie consumption and reduced physical activity leading to positive energy balance [18].

Dietary behaviour: High energy intake from cereals and fats has been recognized as one of the significant predictors of postpartum weight gain [27]. Postpartum women, especially from Southeast Asian countries like India, have no dietary restrictions [1]. They generally consume energy-dense traditional foods which are

Table 1
Indian evidence related to postpartum obesity.

S No.	Author (Place) (Year)	Study design	Statistical test	Predictors/perceptions related to postpartum weight status	Outcome of interest
1	Chopra et al. (India) (2020) [6]	Mixed methods study (Secondary analysis of NFHS-4 data) (n = 16155 pregnant women and n = 19430 postpartum women)	Multivariable logistic regression	Older maternal age [OR 4.13; 95% CI, 3.01−5.66] Increasing wealth quintile [OR 8.25; 95% CI, 5.89−11.56] Higher education [OR 1.90; 95% CI, 1.44−2.52]	Postpartum obesity
2	Nagpal et al. (Mysuru, Karnataka) (2020) [27]	Cross-sectional study (n = 150 postpartum women)	Analysis Of Variance, Chi square analysis and Fischer Exact Test	Waist circumference ($F = 8.473$, $p < 0.01$) Hip circumference ($F = 7.144$, $p < 0.01$) Frequency of breast feeding ($X^2 = 16.76$, $p < 0.008$) Dietary intake of cereals ($F = 3.543$, $p < 0.016$) Dietary intake of fat/oil/ghee ($F = 3.294$, $p < 0.022$) Physical activity ($X^2 = 11.911$, $p < 0.023$)	Postpartum weight retention
3	Kajale et al. (Pune) (2015) [28]	Cross-sectional study (n = 300 postpartum women)	ANOVA, Generalized linear model	Consumption of traditional foods supplements Higher (2−3 times) visible dietary fat intake than Indian recommended dietary allowances Extra fat *(ghee)* consumption during meals Dietary inadequacy of some macro nutrients (protein) and micronutrients (iron, zinc and calcium) Increase in postpartum weight retention [OR 1.8, 95% CI (1.2, 2.5), $p < 0.001$]	Cardio-metabolic risk
4	Kajale et al. (Pune) (2014) [29]	Cross-sectional study (n = 125 postpartum women)	Student's t-test, Generalized linear regression model	Consumption of traditional food supplements ($p < 0.05$)	Postpartum weight gain
5	Ganapathy, (Bangalore, Karnataka) (2019) [30]	Cross-sectional study (n = 185 postpartum women)	Chi-square/Fisher's exact probability tests	Reduced physical activity and increased sedentary behaviour (98.92%) Misconceptions that breastfeeding leads to weight loss automatically (96.76%) Excess caloric intake (97.29%) Misconceptions that genetic factors predetermine weight gain (95.68%) Lack of support (93.51%) Emotional eating for physical and psychological comfort (82%)	Perceptions about postpartum weight retention and weight gain

believed to possess galactagogue properties. Usually, high amounts of jaggery and clarified butter *(ghee)* are used in their preparation. Excessive consumption of these traditional foods rich in fat and sugar adds extra calories resulting in weight gain during the postpartum period [28,29]. In addition to this, certain food taboos quite common in India such as avoidance of specific warm and cold foods, spicy foods, certain vegetables and pulses, red meat have been found to be significantly associated with PPWR [27].

Table 2
Potential predictors of postpartum weight retention and/or weight gain.

Sociodemographic variables (Non-modifiable)	Obstetric variables		Behavioural variables (Modifiable)
	(Non-modifiable)	(Modifiable)	
Higher maternal age Urban residency	Early menarche Lower age at first delivery	Reduced or no breastfeeding Non-exclusive breastfeeding for first six months postpartum	Excessive calorie intake Reduced or no physical activity
Higher education level Increasing wealth quintile	Parity Lower pre-pregnancy body mass index		Lower sleep efficiency Later sleep offset times
Race (such as Asian, Hispanic and Black American)	Higher pre-pregnancy waist circumference Higher gestational weight gain		

Furthermore, postpartum women resort to emotional eating and consume high-calorie foods to get relief from physical, psychological, and emotional discomfort experienced in this period [30].

Physical activity: A decline in moderate to vigorous physical activity level is generally seen during pregnancy which often persists to some extent at six months postpartum. This reduction in physical activity is a matter of concern as it can lead to higher PPWR and/or weight gain [43]. In the Indian context, adherence to traditional customs such as 'doing the month' puts restrictions on the physical activity and makes the postpartum women sedentary for a month following the childbirth [30]. This physical inactivity usually extends further due to various barriers experienced by these mothers [30]. In addition, the greater focus on recovery of the mother after delivery and care for the infant usually subdues the importance of resuming physical activity [30]. Many women are not even properly guided about when to begin or resume physical activity [30].

Sleep: Lower sleep efficiency and later sleep offset times witnessed due to baby care for long hours have been linked to postpartum weight gain [30]. A higher mean score of sleep in the first year postpartum has been found to be a protective factor against PPWR and/or weight gain [25].

Before involving women in weight management strategies, it is crucial to comprehend possible barriers that might be associated with their involvement during the postpartum period.

5. Challenges in the prevention and management of postpartum obesity

The prevention and management of obesity in postpartum women is rather challenging. The barriers faced may have an adverse impact on long-term sustenance of healthy behaviour for weight management. These barriers can be classified into personal factors, socio-cultural factors and lack of scientific information.

Personal factors: After her delivery, the mother faces the challenge of time-consuming child-care coupled with unique personal barriers such as inadequate time management, lack of motivation, and poor self-efficacy. The prime concern of the new mother is to devote herself fully to the care and welfare of her newborn keeping aside her health concerns. Taking care of other children, managing her home, coping with family responsibilities and working outside become her priorities and her care comes at the bottom of the list. The sleep deprivation and tiredness associated with all these tasks further reduce her motivation to pay any heed to her health [30].

Socio-cultural factors: These factors play an important role in the adoption and sustenance of healthy behaviour. Social factors such as lack of family support due to disappointment with the gender of the newborn or an existing non-cordial relationship with the spouse or mother-in-law can worsen the state of the mother [44]. Secondly, cultural factors such as the tradition of a resting period of forty days i.e. a period of "confinement" is followed post-delivery in many Asian countries including India for complete recuperation of the mother. During this period, the mother is confined indoors and allowed to perform only minimal physical activity [30]. She is also fed traditional food supplements that are very high in either fat or sugar or both leading to the intake of extra calories [28,29].

Lack of scientific information: In India, there is a dearth of healthcare professionals to deal with the rising cases of obesity [9]. The absence of follow-ups regarding counselling postpartum women to achieve appropriate body weight in a healthy way as well as lack of information about the resumption, type, intensity and duration of physical activity during this period act as major barriers for mothers in initiating postpartum weight management [30].

These barriers collectively impede the adherence to a healthy behaviour and worsen the life quality of postpartum women. Effective management strategies are needed to address these barriers so as to achieve healthy weight loss among postpartum women.

6. Weight management of postpartum women

It is pertinent to manage the weight of postpartum women to prevent or alleviate the risk of developing obesity. The management procedure should be a realistic, patient-specific and stepwise progression consisting of nonpharmacologic and pharmacologic treatments. Nonpharmacologic treatment including lifestyle intervention related to diet, physical activity, and behavioural therapy should be considered as a fundamental step for the treatment of obesity. However, for grade II and grade III obesity if lifestyle modification alone fails to bring about clinically significant weight loss then pharmacotherapy may be used in conjunction with this [12]. There is no evident consensus on the optimum stage for the commencement of postpartum weight management. This procedure can be initiated within a day or two post-delivery to three-twelve months postpartum [45]. The mother should be provided with face-to-face counselling related to a healthy lifestyle at the time of discharge from the hospital and encouraged to adopt a healthy behaviour as early as possible depending on pregnancy-related complications if any. Lifestyle-related weight management approaches specific to the postpartum women have been discussed below:

6.1. Dietary recommendations

Dietary advice should focus on adequate calorie recommendations coupled with diet quality and frequency of consumption. Calorie intake ranging from 1200 to 1800 kcal/day should be recommended taking into account the current BMI, energy expenditure, and breastfeeding status [46]. Generally, the energy requirements for breastfeeding mothers in first six months increases by 600 kcal/day and in seven to twelve months by 520 kcal/day [47] but in India the dual burden of malnutrition is quite prevalent. Therefore, while computing the energy requirements for normally nourished and over nourished lactating women, it is important to take into account the utilization of fat accreted during pregnancy. Fat accumulated during pregnancy could provide 100–200 kcal/day for milk secretion during the first six months. Accordingly, during lactation additional energy requirements have been reduced from 500 to 300 kcal/day for over nourished women in the recent recommendations [47].

A diet containing 50–60% total carbohydrate, protein 10–20%, total fat less than 30% with saturated fat below 10% of total calorie intake is advisable. A higher intake of complex carbohydrates and fiber keeping the glycemic index low should be emphasized; and the intake of simple carbohydrates should be discouraged. For effective weight loss, a healthy diet comprising whole grains, legumes, nuts, fresh fruits and vegetables, fish, poultry, low-fat dairy products and limited intake of unhealthy fats and processed foods should be encouraged for effective weight loss [10,48].

Micronutrients have a crucial role to play in maintaining optimal health during the postpartum period. The dietary requirements of various micronutrients, especially iron and calcium increase during this period, but the dietary intake of these micronutrients is significantly below the recommendations among women in India [49,50]. Some specific micronutrient suggestions for these postpartum women are given in Box 1.

Box 1
Specific micronutrient suggestions for postpartum women.

Micronutrient	Specific suggestions
Iron	• Needed and be replenished for preventing postpartum iron deficiency anaemia, reduced milk production, and shortened breastfeeding duration • Incorporation of iron-rich foods in the diet such as whole cereals, and pulses, green leafy vegetables, liver, lean meat, egg, nuts and seeds • Consumption of vitamin C rich fruits and vegetables in conjunction with iron- rich foods to facilitate iron absorption • The recommended daily consumption of ascorbic acid for Indians is at least 20mg/ 1000 kcal • Avoidance of foods rich in phytates and oxalates as they hinder iron absorption • Discouraging the consumption of tannin-containing foods such as tea with meals as they inhibit iron absorption • Oral iron-folic acid (IFA) supplementation (100 mg elemental iron and 500mcg of folic acid) should be recommended daily for 14 weeks postpartum for either the women suffering from gestational anaemia or for women not being able to meet iron requirements through the diet • IFA tablet should be consumed two hours after a meal
Calcium	• Needed to meet the increased demand for calcium during lactation, maintain maternal bone mass, and reduce the risk of fractures • Incorporation of calcium-rich foods like milk and its products, beans, green leafy vegetables, nuts, and seeds • Avoidance of foods high in phytate content as they hamper calcium absorption • If calcium requirement is not being met solely through the diet then prescribe calcium supplementation in the form of oral swallowable tablets to be taken two times in a day (each tablet containing 500 mg calcium along with 250 IU Vitamin D3) • Calcium tablet should be consumed one with the morning/afternoon meal and the other with the evening meal • Calcium tablet should not be consumed along with Iron-folic acid (IFA) supplementation as it hinders the iron absorption. IFA tablet should be consumed two hours post meal • Appropriate sun exposure should be recommended

Source: RDA 2020 [47], Ministry of Health and Family Welfare [49], National Health Mission [50].

A five to six meal pattern comprising three major and three minor meals should be advised for better appetite control [48]. The three minor meals should consist of low-calorie and nutrient-dense snacks (a fruit, handful of nuts, a bowl of salad etc.). The energy-dense snacks rich in fat and sugar in the form of galactagogues which are often consumed by women in India during this period should be reformulated by incorporating more fiber and green leafy vegetables to lower their calorie content. This will not only prevent additional calorie intake than recommended but also alleviate nutritional deficiencies in mothers [29]. In addition, emphasis must be laid on reducing portion sizes and avoiding unhealthy cooking practices such as frying [48].

Intake of alcohol and caffeine should be avoided as alcohol consumption hinders the let-down reflex [51] and high caffeine intake leads to poor sleep quality among mothers, thus, adversely affecting their quality of life [52].

6.2. Recommendations for physical activity

Physical activity plays an important role in weight management by making a balance between calorie intake and energy expenditure. Postpartum mothers should be encouraged to engage in physical activity [53]. This will not only help in improving mood and sleep but also enhance their coping capabilities and alleviate stress.

Depending on the presence of complications and mode of delivery mothers should be encouraged to gradually resume physical activity within four to six weeks postpartum. Women who have undergone a caesarean delivery should be advised to seek advice regarding initiation of physical activity from their healthcare professional at the time of their first postpartum visit [54]. Postpartum women should be advocated to aim for at least 150 minutes of moderate-intensity activity every week to achieve and maintain a healthy weight. They should be educated to commence with pelvic floor exercises in the immediate postpartum period [11] and continue it daily and gradually involve in muscle strengthening activities including back and abdominal muscles twice a week. The emphasis should be on adequate hydration before starting physical activity [55]. Regular physical activity post-delivery helps to prevent further weight gain and return to pre-pregnancy weight. It also increases lean mass, improves abdominal muscle tone and cardiovascular fitness. Some specific recommendations for a progressive activity regime during the postpartum period are given in Box 2. Postpartum women should be advised to stop the activity if it hurts and immediately seek medical assistance if they experience heavier, brighter red vaginal discharge than normal menstruation period [56].

Mothers should be made aware of various socio-cultural myths associated with physical activity. First, they should know that being physically active does not affect breastfeeding (both milk production and composition). Secondly, they should be advised to breastfeed their infants before exercising or one hour after exercising [54]. However, studies evaluating the effect of physical activity as a stand alone treatment on postpartum weight change are inconclusive [24].

6.3. Recommendations for breastfeeding

Exclusive breastfeeding for six months postpartum and continued breastfeeding for twelve months or longer is highly recommended for both the infant and the mother [48,57]. Theoretically, it is believed that breastfeeding mounts maternal weight loss due to the increased energy cost of lactation [41]. Nevertheless, available evidence shows inconsistent results on the association between breastfeeding and postpartum weight change [58].

Box 2
Specific physical activity regime for postpartum women.

If a normal vaginal delivery, then,
- Resume physical activity within 0–4 weeks of the childbirth.
- Begin with moderate intensity exercises.
- Start with walking (gradually from slow-paced to brisk walking), deep breathing and Kegel exercises (contraction of pelvic floor muscles) daily.
- Avoid breath holding.
- Gradually progress to abdominal exercises. Avoid torque exercises.
- Slowly start with muscle toning exercises such as push-ups.
- Gradually indulge in strength training involving major muscle groups like arms, legs and hips twice a week.
- Slowly increase the intensity from moderate to moderate-vigorous intensity.

If a caesarean section case, then,
- Resume physical activity after consulting the doctor. Usually women are advised to resume within 6–8 weeks of childbirth.
- Gradually increase the intensity and duration of the exercise as prescribed for the women with a normal delivery.

Progression to a higher intensity activity is recommended only after ensuring complete check-up.

Source: American College of Obstetricians and Gynecologists [54], The Federation of Obstetric & Gynecological Societies of India [55].

Breastfeeding is not significantly associated with weight change in one to three months postpartum [58] whereas it may bring about a significant weight change (reduced weight retention and greater total weight loss) in three to six months postpartum [59]. There are a few studies [59,60] reporting the positive relation between breastfeeding at twelve months or more and weight change while other studies do not [61,62]. Overall evidence supports that longer breastfeeding duration (for twelve months or more) and breastfeeding intensity may bring about weight change [58]. Hence, mothers should be recommended to exclusively breastfeed their infants for six months and continue breastfeeding for twelve months or more.

6.4. Recommendations for sleep

Sleep seems to have an association with weight status. Postpartum mothers should be advised to sleep at least seven hours per night. This will prevent alteration of several hormone levels especially the ones related to appetite regulation – leptin and ghrelin, preventing predisposition to elevated hunger and higher calorie consumption. Moreover, this will prevent opportunities to snacking owing to the time the woman is awake, thus, reducing the excessive calorie intake [25]. Mothers should be encouraged to get tuned with the sleep-wake cycle of the infant and advised to extend the wakeful periods during the daytime in order to seek longer nighttime sleep [63]. Apart from this, the family should be counselled to provide support to the mother in meeting high needs of the infant at night-time [30].

6.5. Behavioural therapy

Initial weight loss and greater adherence to lifestyle advise are key to successful weight loss [12,64]. Behavioural therapy involves a set of principles such as goal setting, self-monitoring, stimulus-control, problem-solving, emotional eating, and relapse prevention. These principles are crucial to ensure the compliance with appropriate diet and physical activity regimes [65]. An individualised, flexible and progressive approach involving components of behavioural therapy is discussed below:

- **Goal setting:** A comprehensive understanding of women's prior knowledge, attitude and practices regarding weight loss is required to set patient-specific goals. These goals should be reasonable and achievable [65], for example, weight loss of around 0.5 kg per week, consuming not more than two teaspoons of sugar in a day, and completing 10,000 steps per day.
- **Self-monitoring:** Self-monitoring is crucial to ensure long-term sustenance. Subjects should be advised to use dietary and exercise logs, maintain diaries, use smartphone applications etc [66], for example, an application to measure 10,000 step counts per day.
- **Stimulus control:** Stimulus control is imperative to improve one's environment to escalate healthy behaviour [65]. For example, improving eating habits by not keeping unhealthy or less healthy food products at home.
- **Problem solving:** Problem solving abilities are crucial to ensure long-term sustenance of healthy behaviour [65]. For example, a postpartum mother facing a challenge to devote time for physical activity as the newborn is her priority should include her baby, either in a pram while going for a walk or laying the baby next to her when performing abdominal exercises.
- **Emotional eating:** Psychological stress during this period can stimulate appetite resulting either in overeating or landing up eating comfort foods. Stress coping strategies should be taught to these women [67].
- **Relapse prevention:** Slip-ups are experienced when one is engaged in lifestyle modification. Relapse prevention is important to resume healthy behaviour [65]. For example, one may get bored or preoccupied with the child ultimately resulting in exercise slip. In such situations, mothers should be encouraged to bring a change in exercise routine or opt for another type of physical activity rather than skipping it altogether.

Barriers encountered during lifestyle modification should be addressed in follow-up sessions [12]. Interactive sessions and group counselling will provide a platform to learn how others have successfully tackled the similar challenges [68]. Sessions should also aim to involve mothers' family because social support from spouse, mother-in-law, other family members and friends escalates mothers' adherence to diet and activity regimes [30]. For example, family members can assist in fulfilling the dietary needs of the mother by having healthy meals with her; helping in babysitting so that mother could devote that time to exercise; the spouse or a friend can accompany her in exercising.

Weight management module for specific groups of women (such as perimenopausal women) is available [69]. The weight management module for postpartum women has been presented in Table 3. The basic structure of the manual has been formed referring to the available international evidence, however, its fine-tuning has been done through the evidence available from Indian studies and the Indian guidelines for postpartum women. Obstetricians and gynaecologists can use this module in their regular clinical practice to ensure effective weight management among postpartum mothers.

Table 3
Women centric weight management module for postpartum women.

Step 1: Elicit readiness to manage weight
• Interpret a woman's perception about her weight
• Explain the main reasons for excessive weight and its probable impact on health
• Highlight benefits of weight management
• Increase awareness about patient-specific, stepwise approach to weight management
Step II: Assessment
Anthropometric measurement:
• Pre-pregnancy weight (from medical records), gestational weight gain (GWG) (from medical records), body weight, height, body mass index (BMI), waist circumference, and bioelectric impedance (if available) should be measured
• Evaluation of body weight and BMI in the postpartum period should be done taking into account the pre-pregnancy weight and/or BMI and rate of GWG
Biochemical assessment:
• Biochemical assessment can be limited
• Risk factors such as diabetes, hypertension identified during pregnancy should be given follow-up attention
• Measurement of haemoglobin and haematocrit for women at risk of anaemia at 4–6 weeks postpartum
Dietary assessment:
• Assess current calorie intake through 24-h dietary recall
• Elicit consumption and composition of foods possessing galactagogue properties
Physical activity assessment:
• Assess current and overall physical activity status
• Elicit presence of complications and mode of delivery
• Elicit if any traditional custom such as 'doing a month' is being followed
Breastfeeding assessment:
• Assess the breastfeeding status (Yes/No)
• Elicit the type of breastfeeding (exclusive, predominant, complementary, and mixed)
• Elicit duration of breastfeeding by determining current status of breastfeeding and by calculating the number of weeks of any and exclusive breastfeeding
Sleep assessment:
• Elicit mothers' sleep duration by determining sleep and wake timings
Step III: Weight management advice
Dietary advice:
• Recommend a balanced diet (calorie ranging from 1200 to 1800 kcal/day) taking into account the current BMI, energy expenditure and breastfeeding status
• Encourage intake of a diet comprising whole grains, legumes, low-fat dairy products, fish, poultry, nuts, fresh fruits and vegetables, and limited intake of foods high in fat, sugar and salt
• Recommend five to six meal pattern with appropriate portion size in every meal
• Promote inclusion of foods rich in iron, vitamin C, calcium, and vitamin D along with information about foods enhancing and hindering their absorption
• Prescribe micronutrient supplementations if requirement is not met through diet alone
• Suggest abstinence from alcohol and caffeine
Physical activity advice:
• Advice commencement of physical activity taking into account the presence of complications and mode of delivery
• Advocate to aim for at least 150 minutes/week of moderate-intensity activity
• Recommend to commence with pelvic floor exercises in the immediate postpartum period
• Advice to gradually involve in muscle strengthening (back and abdomen) activities twice a week
• Emphasise on adequate hydration before starting physical activity
• Advice to stop the activity if it hurts and if experiencing heavier, brighter red vaginal discharge than normal menstruation period and, immediately seek medical assistance
• Inform that physical activity does not affect breastfeeding (both milk production and composition).
• Advice to breastfeed before exercising or one hour after exercising
Breastfeeding advice:
• Recommend exclusive breastfeeding for six months postpartum and continued breastfeeding for twelve months or more
Behavioural advice:
• Set patient-specific goals (weight loss of around 0.5 kg per week)
• Recommend using self-monitoring strategies (food and activity log)
• Promote problem-solving abilities (discuss challenges being experienced and their practical solutions)
• Aim to reduce emotional eating (teach stress coping strategies)
• Encourage relapse prevention (discuss and suggest choices and alternatives to avoid boredom)
Step IV: Follow-up
• Organise follow-up sessions to track progress
• Organise interactive sessions and group counselling to address challenges/barriers encountered
• Involve woman's family (spouse, mother-in-law, or any other family member) to ensure sustainable weight management

7. Conclusion

Women are at increased risk of weight gain in their reproductive years. Giving birth to a baby is a life-changing event for postpartum mothers. There are specific physiological, social, behavioural and emotional challenges to weight management in this period that should not be underestimated. Instead, the postpartum phase should be viewed as an opportune period for increasing awareness among women about various predictors of PPWR and/or weight gain. Realistic, flexible and sustainable weight management strategies should be implemented to facilitate weight loss among postpartum women.

Declaration of competing interest

The Author(s) declare(s) that there is no conflict of interest.

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ORIGINAL ARTICLE

Impact of Corona Virus Disease 2019 pandemic on adherence to gluten-free diet in Indian patients with celiac disease

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Abstract

Aims Lockdown and restricted mobility due to the pandemic of corona virus disease 2019 (COVID-19) has severely affected the continuity of healthcare of patients with acute and chronic diseases. We evaluated the impact of COVID-19 on the adherence to gluten-free diet (GFD), symptom control, and quality of life (QOL) in patients with celiac disease (CeD).

Methods A questionnaire, consisting of both ad-hoc and validated questions, was created after review of literature, group discussions, and expert meetings. Standardized questionnaires namely CeD adherence test (CDAT), celiac symptom index score, and CeD-related QOL were used. The web-based questionnaire was sent to 3130 patients via social media and 452 responses (14.4%) were received. Also, additional 68 patients (not available on any social media application) were interviewed telephonically by a trained dietitian.

Results Overall, 505 patients (females: 318; mean age: 24.1±14.2 years) were included. While only 6.7% (n = 34) had poor compliance to GFD (CDAT > 17) before COVID-19 pandemic, it almost doubled to 12.6% (n = 64) during the COVID-19 pandemic times (p = 0.02). Furthermore, 4.9% (n = 25) of patients were diagnosed contacting COVID-19. Interestingly, 73.2% (n = 370) patients preferred online appointment than physical appointment. Most common difficulties faced during lockdown period were high delivery charges for getting gluten-free (GF) food at home (54.4%), increased prices of regular GF food (43.1%), and travelling long distance to arrange GF food (44.9%).

Conclusions The COVID-19 pandemic has substantially affected the adherence, symptom control, and QOL in patients with CeD, attributable to unavailability, shortage of money, and heightened cost of GF food. The pandemic has offered an opportunity to practice teleconsultation approach for patients with CeD.

Keywords Adherence · Celiac disease · COVID-19 · Gluten-free diet · Quality of life

Introduction

The corona virus disease 2019 (COVID-19) pandemic has led to almost global lockdown from March 2020 till June 2020. In order to escalate the facility for patients with COVID-19 and also to avoid crowding in the healthcare facilities, restrictions were imposed for many patients including patients with chronic diseases. Such restrictions have affected continuity of care of patients with chronic diseases, including those with celiac disease (CeD) [1].

Celiac disease, an autoimmune enteropathy, occurs in genetically susceptible individuals and is triggered by a protein called gluten, present in cereals such as wheat, barley, and rye [2]. Lifelong and complete avoidance of gluten in the diet is the only treatment for patients with CeD at present [3, 4]. Adherence to gluten-free diet (GFD) is essential for the control of the disease [5]. Availability of gluten-free (GF) food is one of the most

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Bullet points of the study highlights

What is already known?

- Lockdown and restricted mobility due to the pandemic of corona virus disease 2019 has severely affected the continuity of healthcare of patients with acute and chronic diseases.

What is new in this study?

- The pandemic has affected the adherence to gluten-free diet and symptom control in patients with celiac disease due to poor availability, high cost of gluten-free food and high delivery charges.
- Almost two third patients preferred online consultation.

What are the future clinical and research implications of the study findings?

- Strategies should be made to maintain a gluten-free food supply chain, online consultation and monitoring of these patients in case of such nation-wide or regional lockdowns.

important factors that determine appropriate adherence to GFD [6]. While medical shops and local stores were allowed to remain open to fulfill the general need of citizens, GF food was not frequently available in all these local stores. The production of GF food in many countries including India is still evolving, and not widely available [7]. A large number of patients with CeD manage their disease by using non-wheat-, non-barley-based cereal consumption or procurement of GF flour from stores. Although many certified GF food items are imported from other countries, being expensive [8–11], these are consumed by a small number of patients on a regular basis. With imposition of almost sudden lockdown, many patients could not procure enough GF food essentials. Furthermore, the production, import, and distribution of GF food items were also severely affected.

With such restrictions and availability of GF food, we hypothesized that the compliance to GFD might have been affected in many patients with CeD that might have resulted in the break in adherence and resultant symptoms. With overall environment of panic and uncertainty, the mental health of citizens and more so of those with chronic diseases has also been affected [12, 13]. We therefore planned to assess the impact of COVID-19 on the adherence to GFD, symptom control, and quality of life (QOL) in Indian patients with CeD using web-based questionnaire. We also wanted to understand the various forms of difficulties faced by patients in maintaining GFD and innovative ways to overcome those barriers by them during the pandemic. The whole purpose of this study was to understand these dynamics so that preventive strategies can be planned during any similar event in future.

Methods

Development and distribution of questionnaire

An expert panel consisting of 3 gastroenterologists, 3 dieticians, and 6 individuals with CeD was assembled to discuss the impact of COVID-19 pandemic on adherence to GFD and the factors affecting the adherence, clinical response to diet (symptom control), and QOL. Over a series of meetings and web meetings, a set of 7 domains relevant to CeD and GFD were constructed, including the following: (a) adherence to GFD, (b) CeD-related symptoms, (c) QOL, (d) GF food stock/supply, (e) support, (f) difficulties faced during lockdown. For assessing the adherence, CeD-related symptoms, and QOL, standardized and validated questionnaires namely, CeD adherence test (CDAT), celiac symptom index (CSI), and CeD-related quality of life (CD-QOL), were used, respectively, along with a few ad-hoc questions developed specifically for each of the three domains. CDAT is a 7-item questionnaire, having five responses, with score ranging from 1 to 5. Scores of < 13 are associated with good GFD adherence, 13–17 with average, and > 17 with poor GFD adherence [14]. Adherence was assessed both before and during the lockdown period. CSI is a 16-item questionnaire, with subscales of "specific symptoms" and "general

health" consisting of 11 and 5 items, respectively. Each item has five responses, score ranging from 1 to 5. Scores of ≤ 30 are associated with both high QOL and excellent GFD adherence, which together are quite suggestive of clinical remission. Conversely, a score of 45 or more is associated with relatively poor QOL and worse GFD adherence suggesting ongoing active CeD [15]. CD-QOL is a 20-item questionnaire, having four clinically relevant subscales (limitations, dysphoria, health concerns, and inadequate treatment). Each item has five responses, with scores ranging from 1 to 5. The overall score is expressed on a scale of 20–100, with a higher score indicating poorer QOL [16].

For the remaining domains, a bank of items was developed in a way that questions were representative of the areas studied. Next sequential meetings and discussions with individuals with CeD and their family members discussed the domains and items decided on by the expert panel. The final question bank consisted of 78 questions, with 11 questions in demographics section and 67 relating to the domains selected (Supplementary Table 1). The questionnaire was then structured in a web survey (google form), and the link was distributed among 15 patients for pilot testing. It helped in assessing the time required for filling the form, answer choices, any discrepancies in selected domains, difficulties faced by patients in filling the form, and appropriateness of the questions to the target population. Pretesting helped in revising the phrases to be maximally understood by the target patients. The questionnaire was sent in both English and Hindi languages. The web-based questionnaire was then sent via social media application namely Whatsapp in 18 Indian celiac support groups (135–246 members in each group), which consists of patients with CeD and their family members. Patients who were not available on any social media application were directly called on their phone from the directory of Celiac Clinic of our institution. A trained dietitian interviewed the patients thoroughly and noted down the responses.

Ethical approval

The study was approved by the Ethics Committee of All India Institute of Medical Sciences, New Delhi (Ref. No. IEC-796/07.08.2020). The identity, contact details, and other personal details of the patients have not been disclosed in the public forum. Participants were asked to fill the questionnaire only if they consented to participate in the study. Thus, submission of the filled questionnaire is a representation in itself that the participants have given their consent.

Statistical analysis

Data are presented as proportions, median, mean, and standard deviation (SD) as appropriate. Paired *t*-test was used to compare the continuous variables. Univariate logistic regression was used to assess the factors affecting the adherence to GFD, before and during the period of lockdown. A *p*-value of less than 0.05 was considered statistically significant. Statistical analysis was performed using Statistical Package for the Social Sciences (SPSS) v20.0 (SPSS Inc., IBM Corporation, Chicago, Illinois, USA).

Results

We sent the web-based questionnaire to 3130 patients on Whatsapp (a social media application) and received 452 responses (response rate: 14.4%). Among those 452 patients who filled the online survey, 15 responses were rejected because of incomplete responses. We also contacted 68 patients telephonically who were not available on any social media application. Therefore, total number of participants included in this study was 505. 81.1% of the responders were from northern India (Delhi: 31.1%; Haryana: 18.8%; Uttar Pradesh: 16.6%; Punjab: 14.7%). The mean age of patients was 24.6 ± 14.4 years (females–311, 61.6%). Ninety-eight (19.4%) patients with CeD reported having another member having CeD in the family, more so among female relatives (mothers 15.3% and sisters 21.4%). Overall, 35.2% (n = 178) of patients were living in the red zone for COVID-19 (areas or hotspots with the highest caseload of COVID-19 and restricted movement of people in and out of the zone). The socio-demographic details of the participants are presented in Table 1.

COVID-19 in patients with CeD

Overall, 10.8% (n = 55) of patients reported symptoms of pneumonia or flu-like symptoms including sore throat, fever, running nose, and body pain. However, only 4.9% (n = 25) of them and 10.8% (n = 55) of their family members reported as being diagnosed with COVID-19. Overall, 29.7% (n = 150) of patients considered themselves to be at a greater risk of having COVID-19 because they had CeD.

Effect on the adherence to GFD

Self-reported adherence

Overall, 68% (n = 343) patients reported maintaining good adherence to GFD before lockdown. With institution of lockdown or restricted availability, 20.5% (n = 104), 38.2% (n = 193), and 41.2% (n = 208) patients reported that their

Table 1 Socio-demographic profile of patients with celiac disease

Socio-demographic characteristics	*n* (%)
Gender	
Male	194 (38.4)
Female	311 (61.6)
Follow-up for treatment of CeD	
At our institution	152 (30.1)
Being treated elsewhere	353 (69.9)
Follow-up since diagnosis of CeD	
1–5 years	245 (48.5)
5–10 years	178 (35.2)
10–15 years	65 (12.9)
> 15 years	17 (3.4)
Family history of CeD	98 (19.4)
First degree relatives	
Father	6 (1.2)
Mother	15 (2.9)
Brother	12 (2.4)
Sister	21 (4.1)
Other relatives	44 (8.8)

CeD celiac disease

adherence to GFD got completely affected, partially affected, and not affected at all, respectively. Of the 343 patients who reported maintaining good adherence to GFD before the national lockdown, 52.4% (n = 180) reported decreased compliance with GFD during the lockdown period, with 16.3% (n = 53) of patients resorting to regular consumption of wheat based diets. Overall, 24% (n = 120) of patients reported intake of wheat-based food items (source of gluten) during the period of lockdown.

Assessment of adherence based on celiac disease adherence test

The mean CDAT scores before and during the lockdown due to COVID-19 were 12.08 ± 3.3 and 12.37 ± 3.6, respectively. Overall, 58.6% reported good compliance to GFD (CDAT score < 13) before COVID-19 pandemic, which reduced to 52.1% during the lockdown. While only 6.7% of patients reported poor compliance to GFD (CDAT score >17) before COVID-19 pandemic, which almost doubled to 12.6% during the lockdown period (p = 0.02). Further, the maximum poor compliant patients were young adults (age range: 20–40 years), compared to other age groups (Table 2).

Effect of lockdown on symptoms of CeD

Approximately, 94% (n = 472) of the patients with CeD reported not observing any new symptom during the period of lockdown. The mean CSI score of the patients during the period of lockdown was 28.3 ± 10.1. Overall, 65.3% (n = 303), 24.7% (n = 125), and 9.9% (n = 50) of patients reported good, average, and poor symptom control, respectively (Table 3). Further, the maximum number of patients having poor symptoms control was young adults (age range: 20–40 years) (Table 3).

Effect of lockdown on the quality of life

While one-third of the patients (33.6%, n = 170) were not worried or tensed about the COVID-19 pandemic, 23.9% (n = 121), 17.6% (n = 89), 14.2% (n = 72), and 10.5% (n = 53) were slightly, moderately, quite a bit, and greatly worried, respectively. Among those who reported being greatly worried, 73.5% (n = 39/53) were women, mostly > 40 years of age. In our study, the median CD-QOL score of patients during lockdown was 56 (range: 20–93). Approximately, 45% of patients, irrespective of the age group, had high CD-QOL scores, depicting their poor QOL during the pandemic.

Support from health care providers

During the period of lockdown, 45.1% (n = 227) and 54.6% (n = 276) patients did not require the need to consult a physician or a dietician, respectively. Majority of the patients (73.2%, n = 370) preferred online consultation rather than visiting any hospital or clinic. Nevertheless, when required to have a consultation, while 36.2% (n = 183) of patients were able to connect with a physician or gastroenterologist, 3.6% (n = 18) failed to get an appointment for consultation. Similarly, 12.8% (n = 65) of patients were able to connect with a dietitian/nutritionist, but 9.1% (n = 46) patients could not find any. For whichever query or requirement, only 19.8% (n = 100) of patients were able to reach out to their regular doctor(s) (whom they were consulting before lockdown), while 4.3% (n = 22) of patients did not have any contact information of their respective physicians. Similarly, when required, only 10.1% (n = 51) of patients were able to reach out to their regular dietitian, while 9.3% (n = 46) of patients did not have any contact information available.

Difficulties faced in procuring GF food

The various difficulties faced by patients in procuring GF food and maintaining GFD during the period of lockdown are listed in Table 4. The most common difficulties reported by nearly half of the patients were paying higher delivery charges for getting GF food at home (52.4%), higher prices of regular GF food during lockdown (43.15%), and travelling long distance to arrange GF food (44.9%).

Table 2 Celiac disease adherence test score of patients with celiac disease

	Before COVID-19 pandemic			During COVID-19 pandemic		
	Good *n* (%)	Average *n* (%)	Poor *n* (%)	Good *n* (%)	Average *n* (%)	Poor *n* (%)
Gender-wise distribution						
Males (*n* = 194)	124 (24.5)	55 (10.8)	15 (2.9)	112 (22.1)	60 (11.8)	22 (4.3)
Females (*n* = 311)	172 (34.0)	120 (23.7)	19 (3.7)	151 (29.9)	118 (23.3)	42 (8.3)
Total (*n*= 505)	296 (58.6)	175 (34.6)	34 (6.7)	263 (52.1)	178 (35.2)	64 (12.6)
Age-wise distribution (in years)						
< 12 (*n* = 110)	85 (16.8)	24 (4.7)	1 (0.1)	80 (15.8)	25 (4.9)	5 (0.9)
12–19 (*n* = 126)	73 (14.4)	48 (9.5)	5 (0.9)	75 (14.8)	37 (7.3)	14 (2.7)
20–40 (*n* = 201)	91 (18.0)	84 (16.6)	26 (5.1)	71 (14.0)	91 (18.0)	39 (7.7)
> 40 (*n* = 68)	47 (9.3)	19 (3.7)	2 (0.3)	37 (7.3)	25 (4.9)	6 (1.1)

CDAT score ≤ 13= good, 13–17 = average, ≥ 17 = poor. *CDAT* celiac disease adherence test, *COVID-19* corona virus disease 2019

GF food stock/supply

Almost two-third of patients (62.5%, *n* = 316) could not find any GF food in their nearby stores. Only 26.7% (*n* = 135) of patients reported that GF food was kept as an essential food item in stores nearby their residence, while 10.7% (*n* = 54) of patients were completely unaware of it because they did not step out to check. In procuring GF food from market or different parts of the city, 28.8% (*n* = 145) did not face any difficulty in travelling and 52.8% (*n* = 267) faced some hurdles, while 18.4% (*n* = 93) could not travel at all. A large proportion of the patients (58.8%, *n* = 297) ordered GF food via various websites, food delivery applications, or directly from the manufacturers/whole-sellers. Surprisingly, 12.2% (*n* = 62) of patients were unaware of any such online sources to purchase GF food. The patients who ordered GF food from online sources faced difficulties like delayed delivery, no delivery in certain areas, delivery far away from home, and heavy delivery charges for getting GF food at home. Nearly, half of the patients (49.1%, *n* = 248) received support from fellow patients in knowing shops to purchase GF food.

Table 3 Celiac symptom index score of patients during the period of lockdown

	Good, *n* (%)	Average, *n* (%)	Poor, *n* (%)
Total (*n* = 505)	330 (65.3)	125 (24.7)	50 (9.9)
Gender-wise distribution			
Males (*n* = 194)	141 (27.9)	32 (6.3)	21 (4.1)
Females (*n* = 311)	189 (37.4)	93 (5.9)	29 (5.7)
Age-wise distribution (in years)			
< 12 (*n* = 110)	84 (16.6)	23 (4.5)	3 (0.5)
12–19 (*n* = 126)	96 (19)	24 (4.7)	6 (1.1)
20–40 (= 201)	109 (21.5)	54 (10.6)	38 (7.5)
> 40 (*n* = 68)	41 (8.1)	24 (4.7)	3 (0.5)

CSI score ≤ 30 = good, 30–45 = average, ≥ 45–80 = poor. *CSI* celiac symptom index

Factors affecting the adherence to GFD

On univariate logistic regression, the rate of non-adherence to GFD was high in those having COVID-19 (OR = 8.96; 95% CI: 3.6–21.1; $p = 0.001$) and or anyone in the family (OR = 2.54, 95% CI: 1.4–4.5; $p = 0.02$). Among other factors, heavy delivery charges for getting GF food at home, higher prices of regular GF food during lockdown and shortage of money to buy food items played statistically significant role in affecting the adherence of a patient to GFD (Table 5).

Discussion

The present study has focused on the impact of COVID-19-associated countrywide lockdown and restricted mobility on the adherence to GFD, symptom control, QOL, and

Table 4 Difficulties faced by patients with celiac disease in procuring gluten-free food during the period of lockdown

Difficulties faced in procuring GF food	*n* (%)
Heavy delivery charges for getting GF food at home	265 (52.4%)
Travelling long distance to procure GF food	227 (44.9%)
Increased prices of regular GF food during lockdown	218 (43.1%)
Shortage of grains to GF flour at home	141 (27.9%)
No transport available to travel to get groceries	112 (22.1%)
Shortage of money to buy food items during lockdown	105 (20.7%)
Disrupted courier services	25 (4.9%)

GF gluten-free

Table 5 Factors affecting adherence to gluten free diet during the period of lockdown *COVID-19* corona virus disease 2019, *CeD* celiac disease, *GF* gluten-free

Variables	Odds ratio (OR) 95% confidence interval	*p*-value
Female gender	1.3 (0.8–2.1)	0.19
Occurrence of COVID-19 in CeD patients	8.9 (3.6–21.	0.001
Occurrence of COVID-19 in the family member	2.5 (1.4–4.5)	0.02
Having symptoms of pneumonia/sore throat	1.9 (1.04–3.5)	0.03
Heavy delivery charges for getting GF food at home	2.1 (0.9–2.7)	0.81
Travelled long distance to arrange GF food	1.1 (0.7–1.6)	0.62
Non-availability of the transport to get groceries	0.9 (0.5–1.6)	0.91
Shortage of GF flour at home	1.09 (0.6–1.7)	0.70
Disrupted courier services	0.3 (0.09–1.07)	0.03
Higher prices of regular GF food during lockdown	1.8 (0.9–2.2)	0.08
Shortage of money to buy food items during lockdown	1.9 (0.9–2.6)	0.05

difficulties faced by Indian patients with CeD. The lockdown state affected the adherence to GFD in almost 60% of Indian patients (both children and adults) with CeD. The safety measures to prevent and control the spread of COVID-19 had a profound impact on the GF food supply to patients with CeD. Overall, 10.8% (n = 55) of patients reported symptoms of pneumonia or flu-like symptoms; however, only 4.9% of them and 10.8% of their family members were diagnosed to have COVID-19. However, this cannot be generalized to the entire CeD population as many may have remained asymptomatic and not get tested. The non-adherence to GFD was almost 8-fold higher in patients with CeD who had developed COVID-19 compared to those who did not.

Overall, one-third (29.7%) of patients considered themselves at greater risk of having COVID-19 because they had CeD. Similar results have been shown in Italy where almost 20% of patients felt more vulnerable to COVID-19 because they had CeD [17], although Emmi et al. reported that the risk of severe acute respiratory syndrome corona virus-2 (SARS-CoV-2) infection was similar among people with autoimmune disorders and the general population [18]. Moreover, in our study, only 5% of patients with CeD got infected with SARS-CoV-2 virus. Further, almost 11% of patients in our study faced flu-like symptoms including sore throat, fever, running nose, and body-pain. Yet another Italian study showed similar results where 13.7% of patients showed flu-like symptoms with no diagnosis of COVID-19 [19].

Atleast 10.5% (n = 53) of patients reported being greatly worried about the COVID-19 pandemic, majority being women (73.5%; n=39/53) over > 40 years of age. Further, 45% of patients, irrespective of the age group, had high CD-QOL scores, depicting their poor QOL during the pandemic. However, the QOL may have been affected by the overall situation of panic during the pandemic, and not just due to CeD-related factors.

In the present study, although a greater number of patients were able to reach out to the respective physician or dietitian for online consultation, a few could not. The appropriate adherence to GFD is the key to the success of treatment, and maintenance of adherence requires repeated consultation with a dietitian or a nutritionist. It is obvious that limited availability of GF food created by this pandemic must have raised questions in the mind of patients and their families about the GF nature of the available food and how best to maintain adherence in such situation. It thus looks most appropriate that necessary information about maintaining adherence is provided to patients through health care providers and patient support groups. This pandemic provided and established the value of teleconsultation as an important mode of consultation with the physicians and dieticians for management of diseases like CeD. Our findings are in line with the Italian study (2020) where patients also preferred remote consultation during the period of lockdown [17].

The adherence of a patient to GFD was significantly affected by factors such as high prices of GF food, high delivery charges, and shortage of money to buy food items during the lockdown state. Majority (62%) of the patients could not find GF food items in their nearby stores. Non-availability of GF food has already been established as one of the major barriers in adherence to GFD by Indian patients with CeD [20], which got accentuated in pandemic. In our study, more than 50% of those patients who maintained strict adherence to GFD before the pandemic, reported difficulties in maintaining their adherence to GFD during the pandemic. India is still in its infancy in terms of production of GF food items, and the one's mostly produced are from small-scale or middle-scale industry [7]. The shutdown of factories, shortage of labor, and limited imported GF food items contributed to further increase in the prices of GF food during lockdown. The most

devastating impact of COVID-19 and the subsequent lockdown had been on the economically backward classes, with limited access to proper healthcare and other resources.

While the individual rate of adherence to GFD was significantly affected, the mean CDAT scores, however, remained almost similar during the lockdown compared to before the lockdown (12.08 ± 3.3 before vs. 12.37 ± 3.6 during lockdown). CDAT has been proven in multiple patient cohorts to adequately represent the adherence to GFD; however, CDAT has its own pitfalls. CDAT has components on QOL, symptoms, and gluten adherence. There are questions like "how many times you have eaten outside" which due to lockdown has resulted in a zero response to this question. Interestingly, even in patients having good adherence before the lockdown, the adherence scores got further better (decreased from 12 towards 7) because of lack of travel or use of outside food.

During such nation-wide or regional lockdown or curfew states, methods should be devised to make availability in the local stores of foods items required for patients with special food needs. Naturally GF grains like millets should be made available in all grocery stores and ration shops at subsidized rates for such patients. All patients should be provided the contact details of their concerned healthcare provider so that teleconsultations by doctors and dietitians can be accomplished. All patients should have access to celiac support groups to gather information about GFD.

The strength of the present study is the use of standardized questionnaires assessing different domains. The questions were kept both open-ended and multiple choice answers in order to not influence the answers of the patients. Although the questionnaire was not validated by any celiac society, majority of its components have been validated and used in CeD. One of the major limitations of this study is the use of social media platforms where response rate is generally limited. Since only 14.4% of patients with CeD responded to the questionnaire, this data may not be representative of the whole population. Furthermore, since the assessment of adherence to GFD before COVID-19 pandemic has been based on recall, the CDAT scores for that period could have been affected by optimistic recalls. While social media platforms allow reaching out to a larger number of subjects/patients, the reliability of such response may not be perfect.

In conclusion, the COVID-19 pandemic has substantially affected the adherence, symptom control, and QOL in patients with CeD, attributable to unavailability, shortage of money, and heightened cost of GF food. The pandemic has offered a great opportunity to practice teleconsultation approach for CeD healthcare.

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Declarations

Competing interests WM, AC, AA, AS, MSR, SM, VJ, VB, AA, AP, NV, AM, NS, AM, and GKM declare no competing interests.

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Ethics statement The study was performed conforming to the Helsinki declaration of 1975, as revised in 2000 and 2008 concerning human and animal rights, and the authors followed the policy concerning informed consent as shown on Springer.com.

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Natural Black Dyeing: A Sustainable Way Ahead

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ABSTRACT

Traditionally, the methods used for natural black dyeing, have been riddled with problems due to complexities of procedures involved, low colour yield and poor fastness properties. In the present study, an attempt was made to produce a good black hue on Cotton, Woollen and Silk fabrics using a single or a suitable combination of Natural dyes of primary colours - Red, Blue, and Yellow along with mordanting. The dyed samples were analysed for their colour value in terms of their L*a*b* and K/S measurements and fastness properties to light and washing. Among all the dyes samples the ones within the 'Circle of Tolerance Limits' were selected as close to ideal black. This research work has been awarded as The Best Project Award in Natural Dyes by Alps Industries Ltd.

Keywords: Complexities, Fastness, Hue, Mordanting

INTRODUCTION

An interesting colour black, has a sophisticated appeal, which makes it appropriate for select quality merchandise. It epitomizes authority, sophistication and has overtones of sensuality (EraGem, 2020).The colour is associated with Hi-Fashion –The Haute Couture, Chic Packaging and Avant-Garde designs (Bane, 2018)

Since the classical age, admiration for black colour, has seen it being extracted from natural sources like pepper, blackberries, pomegranate and logwood (Mohanty, et.al., 1987). It's use in the more popular Madhubani and Kalamkari paintings, has had black being produced from Iron acetate of sugarcane and palm jaggery in combination with Myrabolan (Cardon,D, 2007). However, traditional methods of natural black dyeing have been riddled with problems (Zollinger, 2004). This is due to the complexity of procedures involved, poor fixation of dye stuffs

(Arora, et.al., 2017) leading to poor fastness properties (Vankar, P.S., et.al., 2001) and very low colour yield, making the process highly uneconomical (Saxena, et.al.,2001) and commercially unviable (Gulrajani & Gupta 1992). Hence, in the present study, an attempt was made to produce a good black hue on cotton, wool and silk using a single or a suitable combination of dyes of primary colours - Red, Blue and Yellow along with mordanting. Dyeing had been carried out using the Exhaust and Dip Dyeing methods in a three-step dyeing process.

OBJECTIVES

1. To standardize the dyeing procedure of developing black colour on cotton, wool and sil, using natural dyes in combination with mordant.
2. To measure colour value of the dyed samples in terms of their L*a*b* and K/S values.
3. To test wash fastness and light fastness of the dyed samples

MATERIALS AND METHODS

- Three **Natural fibres** were used for the study, which were, 100% cotton yarn (leas), 100% wool yarn (leas) and 100% mulberry silk fabric (plain weave) respectively.
- Various **natural dyes** selected were -
  Acacia catechu (Thar), Coccus laccae (Lac), Indigofera tinctoria (Indigo), Punica granatum (Pacific) & Termenalia chebula (Kongo)
- **Chemicals used** were -
  -- Oxalic acid $(COOH)_2, 2H_2O$
  -- Sodium Hydroxide (NaOH)
  -- Sodium Hydro-sulphite ($Na_2S_2O_4$)
  -- Sodium Carbonate (Na_2CO_3)
- **Mordant Used**
  -- Ferrous sulphate ($FeSO_4, 7\ H_2O$)

For the study, natural dyes, mordants and pre-treated cotton leas that had been scoured, bleached and desized were provided by the Alps Industries. The Woollen leas were given scouring treatment at 60°C for 1/2 hour using Lissapol solution. The M.L.R (Material To Liquor Ratio) was 1:30. The silk fabric had been degummed and bleached, to remove all impurities present. The Degumming operation was carried out in a liquor containing 1 g/l of Lissapol, 0.4% o.w.f concentration of Na_2CO_3 & 0.5% NaOH at 90°C for 30° minutes.

- **Dyeing Methods**

The dyeing was carried out on Cotton, Wool & Silk using either a single or a suitable combination of Natural dyes of primary colours - Red, Blue & Yellow along with mordanting with $FeSO_4$, at 2% o.w.f concentration. The procedures used are as follows:-

a) Dyeing with Acacia catechu (Thar):

The dye bath was prepared at an M.L.R (Material To Liquor Ratio) of 1:30 which was heated to a temperature of 80°C. The goods were entered and dyeing was carried out for 30 minutes. The pH was noted as 6.

Post-mordanting of the Thar dyed materials was carried out with Ferrous sulphate at 2% concentration owf. The mordanting was done for 20 minutes at 40°C.

b) Dyeing with Indigofera tinctoria (Indigo):

Dyeing with Indigo was carried out in an Indigo vat, where the dye was pasted with a few drops of water. Sodium Hydro-sulphite (same quantity as Indigo dye concentration) was added to the vat, followed by the addition of 20 ml of water, Lastly, Sodium hydroxide pellets (1/4 of Indigo dye concentration) were added to the Indigo vat. The material was added to the vat and the dyeing was done at room temperature. After dipping for 15 minutes, the material was taken out, squeezed and oxidized by exposure to the air for 10 minutes. Goods were then re-dipped in the Indigo vat for another 15 minutes, taken out and squeezed and exposed to air. The chemical oxidation of the Indigo dyed material was done using 2 g/l Hydrogen peroxide for 10 minutes at room temperature. The M.L.R. for dyeing was 1:30. Note: For wool and silk, the dyeing pH was kept at 9 and for cotton, the pH was 10.5-11.5.

c) Dyeing with Punica Granatum (Pacific) and Terminalia Chebula (Kongo) -

The dye bath was prepared, by taking required M.L.R of 1:30 and was heated to 80°C. The goods were entered and dyeing was done for 30 minutes. The pH was noted as 6.

Post-mordanting of the Pacific and Kongo dyed samples was done using Ferrous sulphate at 2% owf concentration at 40° C for 20 minutes.

d) Dyeing with Coccus laccae (Lac dye)

Woollen and silk materials were dyed with the Lac dye. The dyeing was carried out at 70°C for 30 minutes.

The pH of the dye bath was maintained between 2-3 using oxalic acid. The M.L.R. was maintained at 1:30. Mordanting treatment given to Lac dyed samples were:

(a) Simultaneous mordanting with Ferrous sulphate at 2% concentration o.w.f was done where black was produced using only Lac dye. Subsequent to this dyed, mordanted samples were treated with Sodium carbonate for 30 min. in an M.L.R of 1:30. The temperature was maintained at 40°C.

(b) Post mordanting of Lac dyed wool and silk samples with Ferrous sulphate at 2% concentration o.w.f was done at 40°C for 20 minutes (for 3 step dyeing procedure using Lac dye).

Black colour was achieved on the woollen leas (by a one stage application of the mordant either-simultaneous or post mordanting) whereas on silk, only a bluish black colour could be obtained by simultaneous mordanting.

Therefore a further post mordanting was carried out for a satisfactory black.

e) Dyeing using Dip method:

The materials were dyed, with the procedures given above, using Thar, Indigo and Pacific/ Kongo dyes. In the dip method, dyeing was carried out in two cycles. The dye baths from the first dyeing cycle were retained and the materials were re-dipped for the second cycle in the same dye baths. The 1st dyeing cycle was for 30 minutes and 2nd cycle was 15 minutes.

For post-mordanting with Ferrous sulphate at, 2 % concentration, the mordant baths were prepared fresh for both the dyeing cycles (1st and 2nd).

Table -1 : Dyeing on Cotton

Dyeing on Cotton	Code No.	THAR	INDIGO	KONGO	PACIFIC	LAC
		(Mordant: FeSO4 at 2% concentration)				
a. Using Pacific						
	L	6%	4%	-	13%	-
	U	6%	6%	-	13%	-
	G	6%	6%	-	15%	-

	B-1	10%	10%	-	15% ,	-
	R-1	10%	10%	-	15%	-
	T	10%	10%	-	20%	-
	N	15%	10%	-	20%	-
b. Using Kongo	1	6%	6%	15%	-	-
2. **Dip Method Dyeing**:						
a. Using Pacific	A-1	10%	6%	-	15%	-
	R-2	10%	10%	-	15%	-
	V	15%	10%	-	20%	-
b. Using Kongo	1-2	6%	6%	15%	-	-

Table -2: Dyeing on Wool

Dyeing on Wool	Code No.	THAR	INDIGO	KONGO	PACIFIC	LAC
1. **3 Step Dyeing Procedure**						
Exhaust Method:						
a. Using Pacific	P-1	6%	6%	-	13%	-
	P	6%	6%	-	15%	-
b. Using Kongo	X	6%	6%	15%	-	-
Dip Method Dyeing:						
a. Using Pacific	D-P	6%	6%	-	15%	-
b. Using Kongo	D-X	6%	6%	15%	-	-
3 Step Dyeing Procedure:						
a. Using Lac	Z-2	-	4%	-	13%	6%
	Z-1	-	6%	-	13%	6%
	Z	-	6%	-	15%	6%

Dyeing on Wool		**Lac**		**Sodium Carbonate**
2. **Single Step Dyeing procedure**				
Simultaneous mordanting using FeSO4 at 2% concentration	B	7%		10%
	Y	10%		10%
	W	10%		13%

Table-3 Dyeing on Silk

Dyeing on Silk	Code No.	THAR	INDIGO	KONGO	PACIFIC	LAC
	(mordant: $FeSO_4$ at 2% concentration)					
1. **3 Step Dyeing Procedure** **Exhaust Methods**:						
a. Using Thar	A	6%	6%	-	15%	-
b. Using Lac	B	-	6%	-	15%	6%
Dyeing on Silk		**Lac**		**Sodium Carbonate**		
2. **Single Step Dyeing Procedure** Simultaneous mordanting using $FeSO_4$ at 2% concentration						
	C	7%		10%		
	F	10%		10%		
	E	10%		13%		

Table- 4: L* Values of Cotton

Dyeing methods		Sample (Code No.)	L*
1.	**Exhaust Method:**		
a.	Using Pacific	L	25.43
		U	19.51
		G	17.35

		B-1	14.16
		R-1	16.24
		T	14.81
		N	15.70
b.	Using Kongo	I	16.00
2	**Dip Method:**		
a.	Using Pacific	A-1	13.12
		R-2	13.08
		V	12.11
b.	Using Kongo	1-2	16.82

Table -5: L* Values of Wool

Dyeing methods		Sample (Code No.)	L*
1.	**Exhaust Method:**		
a.	Using Pacific	P-2	12.92
		P-1	12.89
		P	12.69
b.	Using Kongo	X	13.74
2.	**Dip Method**		
a.	Using Pacific	D-P	12.60
b.	Using Kongo	D-X	13.80
		Z-1	11.82
3.	**Exhaust Method**		
b.	Using Lac	Z -2	11.90
4.	**Using Lac Dye after treatment with Sodium Carbonate**		
		B	11.96
		Y	12.29
		W	11.30

Table -6: L* Values of Silk

Dyeing methods		Sample (Code No.)	L*
1.	**Exhaust Method:**		
a.	Using Pacific	A	27.34
b.	Using Lac	B	26.48
2.	**Using Lac Dye after treatment with Sodium Carbonate**		
		C	26.85
		F	28.01
		E	24.18

- **Testing**:

The dyed samples were analysed for their colour value in terms of their L*a*b* & K/S measurements and fastness properties to light and washing.

The ACS spectrophotometer interfaced with an IBM. PC was used to analyse the K/S values of samples.

The values of CIELAB co-ordinates L*a*b*, a measure of colour quantity, type and amount of colour in a specimen was measured using a spectrophotometer interfaced with an IBM computer. In the present study, for the black dyed samples, central point (O, O) on the CIE co-ordinates in the Anlab Colour Space was considered as standard pure black and a specified area around the centre indicated by circle was considered as acceptable limits for black dyed limits for black dyed samples. Hence, in the study, “Circle of Tolerance Limits” which defines the acceptability standards for a black dyed sample was used.

The wash fastness of the samples was tested according to ISO105/ E-1978 specifications in the Paramount Launderometer.

The light fastness of the samples was tested in the Sun test CPS+(Atlas) Light fastness tester with Xenon lamp.

Table -7: K/S Values of dyes Cotton samples

Dyeing Methods	Sample (Code No.)	K/S
1. **3 Step Dyeing Procedure**		

a. Using Pacific		
	L	15.62
	U	15.93
	G	16.19
	B-1	21.03
	R-1	18.05
	T	19.58
	N	24.26
b. Using Kongo	1	16.54
2. **Dip Method Dyeing:**		
a. Using Pacific	A-1	22.05
	R-2	22.00
	V	25.17
b. Using Kongo	1-2	18.25

Table -8: K/S Values of dyed Woolen samples

Dyeing methods		Sample (Code No.)	L*
1.	**Exhaust Method:**		
a.	Using Pacific	P-2	23.05
		P-1	23.10
		P	23.16
		X	23.40
b.	Using Kongo		
2.	**Dip Method**		
a.	Using Pacific	D-P	23.08
b.	Using Kongo	D-X	23.38
3.	**Exhaust Method**		

b.	Using Lac	Z-1	25.72
.		Z -2	25.58
		Z	25.89
4.	**Using Lac Dye after treatment with Sodium Carbonate**		
		B	25.89
		Y	24.13
		W	25.99

Table– 9: K/S Values of dyed Silk samples

Dyeing methods		Sample (Code No.)	L*
1.	**Exhaust Method:**		
a.	Using Thar	A	9.04
b.	Using Lac	B	9.64
2.	**Using Lac Dye after treatment with Sodium Carbonate**		
		C	8.23
		F E	7.78 9.77

RESULT AND DISCUSSION

The results of L*a*b*, K/S, Wash and Light Fastness tests for Cotton, Wool and Silk samples were as follows:

(a) Cotton:

In the exhaust method of dyeing using Pacific, Indigo and Thar dyes, there was one sample in the Circle of Tolerance Limits (CTL). This had been dyed with maximum concentrations of the 3 dyes (Sample N) (Refer to Fig.1).

Visually, amongst all the sample, the darkest was sample B-1 which was on the borderline of the circle. This sample had lowest value of L* probably due to a higher Indigo concentration. It was seen that as Indigo concentration was increased the samples became more intensely black, gradually moving towards the circle.

Cotton leas, were also dyed with the dip method of dyeing. Most of the samples obtained were good blacks & were found to be within the CTL. The darkest sample achieved by this process was samples V, with the lowest L* value of 12.112. Hence, amongst all the methods tried on cotton, the dip method using pacific gave best results. These samples also gave maximum values of K/S, followed by the exhaust-Pacific dyed samples (Refer to Tables 4 & 7).

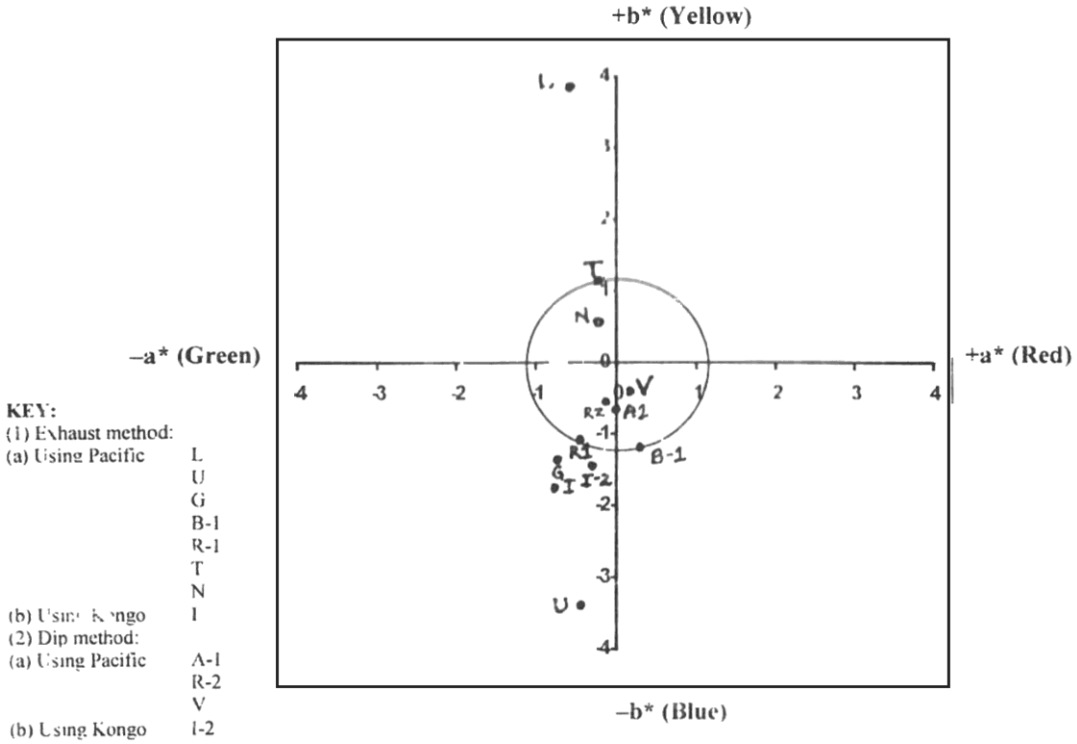

Figure 1: Plot of a*b* values of Cotton

(b) Wool:

The a*b* plot shows that 8 woollen samples were within the CTL, close to ideal black colour. In case of the exhaust method of dyeing using Pacific, Indigo and Thar dyes there were two samples within the circle (sample P&P-1). The sample P was closest to the centre point with L* value of 12.69. In case of wool, too, as the concentrations of Indigo was increased, the samples

became more intensely black. However, unlike cotton, in case of wool, the exhaust method was able to achieve darker blacks when compared with dip method of dyeing (Refer Fig 2).

The woollen leas (sample Z, Z-1, Z-2) dyed with exhaust method using Lac, Indigo and Pacific dyes were also found to have low L* values. The best blacks were achieved with a combination of Lac dye and Sodium carbonate. These samples (sample W) had lowest L* values & were found to be within the circle (Refer Table 5).

As regards the K/S values, sample W, had the highest value of 25.99, closely followed by sample Z at 25.89.

The Exhaust - That dyed sample (sample P) had lower K/S value than sample Z (Refer Table 8).

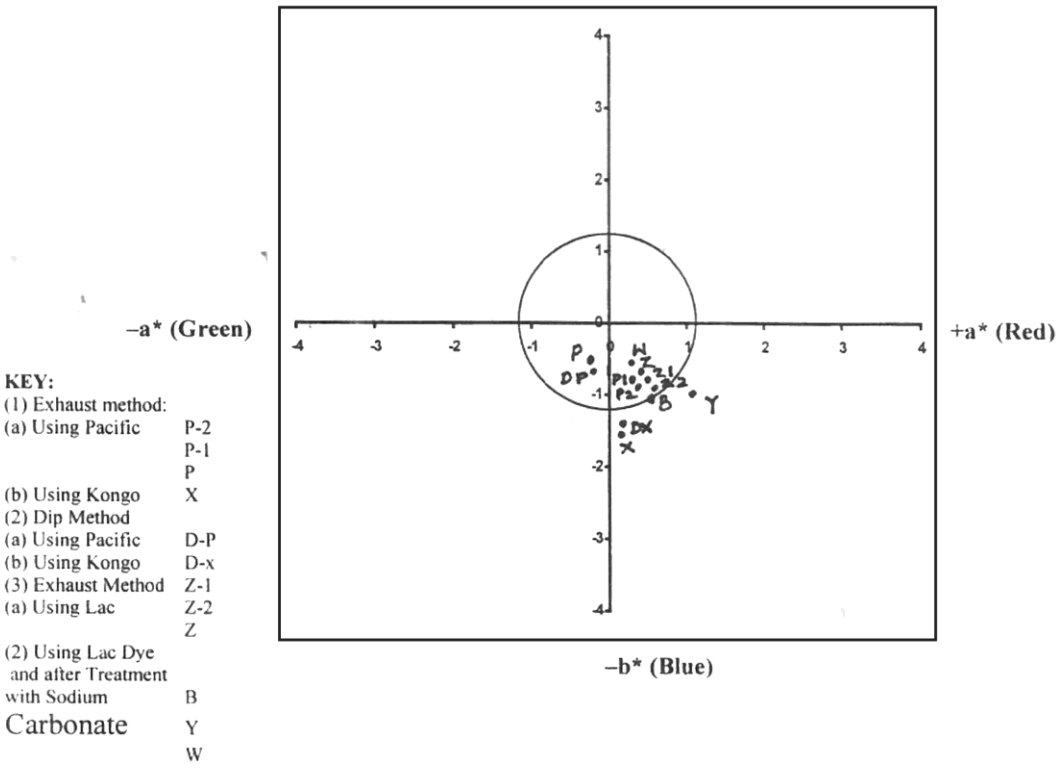

Figure 2: Plot of a*b* values of Wool

(c) Silk:

It was seen that the best black in terms of the L*a*b* values had been achieved using Lac dye & sodium carbonate (sample E). Sample B was also found to lie inside the circle (Refer to Fig 3). This had been dyed using Exhaust Lac method. The Exhaust - Thar dyed sample (sample A), also gave a satisfactory black, the highest K/S values were achieved for sample E the Exhaust - Lac & Exhaust - Thar dyed samples showed slightly lower K/S values (Refer to Table 9).

The light fastness of cotton, and wool samples were excellent, showing a rating ranging between 5-6. In case of silk samples. Light fastness was observed as ranging between 4*5.

The wash fastness of all the dyed samples was found to be excellent. The rating of staining was observed to be 5 and that of colour change as 4-5.

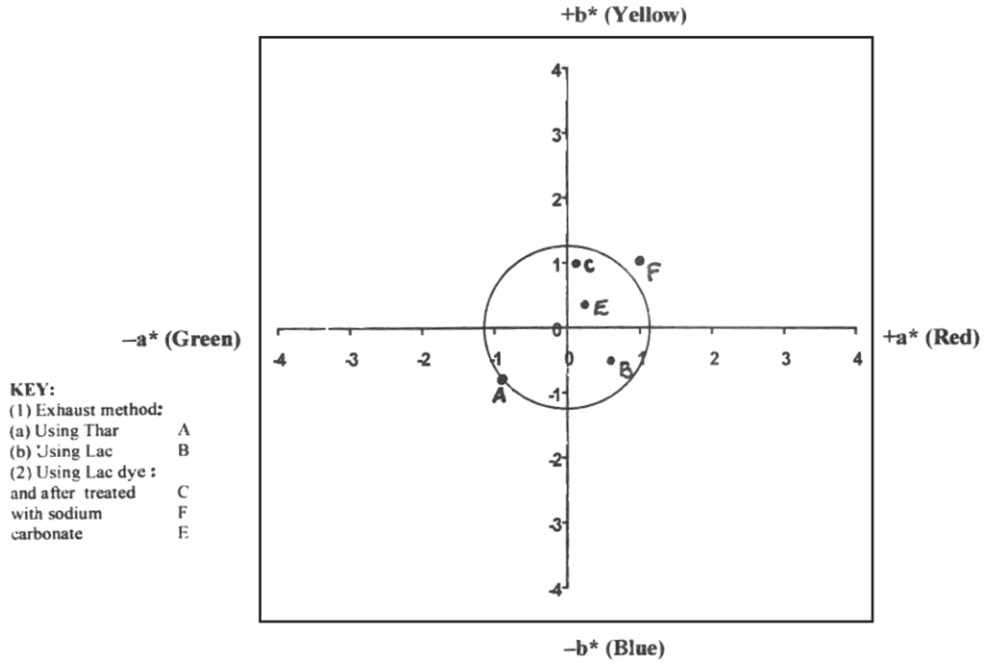

Figure 3: Plot of a*b* values of Silk

CONCLUSION

From the result of the present study, it was possible, to achieve a good black on cotton, wool & silk, using a single or a suitable combination of dyes of primary colours - Red, Blue & Yellow along with mordanting.

For the three materials, post-mordanting with Ferrous sulphate at 2% Concentration o.w.f was found to yield the best black colour. It was seen that as Indigo concentrations were increased, the samples became more intensely black and showed lower L* values. The samples dyed with Lac dyes and treated with Sodium Carbonate showed highest K/S values on Woolen and Silk fabrics. The exhaust method of dyeing, using Pacific, on cotton gave a good black. The light fastness of Cotton and Wool samples were excellent, ranging between 5-6. The wash fastness of all dyed samples was found to be excellent.

SCOPE FOR FURTHER WORK

- Development of black colour can be worked on synthetic fibres on the same lines as this study
- Further studies can be undertaken with other natural dyes, yielding Red, Blue and Yellow colours, to produce black colour on natural fibres.

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Sustainable menstrual alternatives: The journey so far

Dr. Sabrina Sareen

Abstract
Biodegradable materials, eco-friendly solutions, natural products and sustainable resources have become important keywords in today's times, especially since they offer possible solutions to waste-disposal problems. The magnitude of this alarming situation can be understood from the fact that around 1,50,000 tons of sanitary napkin waste is generated every year and these single-use sanitary napkins are composed of more than 90% plastic which do not undergo biodegradation, exhausting landfill sites for another 700-800 years. This article reviews the researches carried out in the past decade, to understand the various biodegradable materials being offered as possible solutions to this increasing waste menace world over. It shall prove to be handy for research studies in the direction of replacing the existing commercial pads with completely biodegradable ones.

Keywords: Eco-friendly solutions, sustainable, landfill, conventional pads, biodegradable napkins

Introduction
Biodegradable materials, eco-friendly solutions, natural products and sustainable resources have become important keywords in today's times, especially since they offer possible solutions to menstrual waste-disposal problems. The magnitude of this problem can be understood from the fact that around 150,000 tons of sanitary napkin waste is generated every year and these single-use sanitary napkins are composed of more than 90% plastic which do not undergo biodegradation, exhausting landfill sites, for another 700-800 years [1].
The review traces significant progress made in the fields of genetic engineering- biodegradable polymers, antibacterial nano-colourants and nano-fibres, cellulose based hydrogels, organic cottons (GMO variety), in order to produce more sustainable alternatives to disposable plastic napkins. Sustainable fibres such as-Soybean, Bamboo, Banana, Milkweed, Water Hyacinth, Jute, Hemp, Wool have been researched in different blend compositions to provide eco-friendly alternatives to disposable plastic pads. Materials like Corn starch have been found to provide leak-proof, sustainable bottom layer against the plastic layer in disposable pads. Herbal Antimicrobial extracts such as Tulsi, Neem, Aloe vera, Curcumin Longa are being successfully used as outer coating on sanitary napkins, to provide skin-friendly napkins. Sustainable Pads are also being created using knitwear industry waste and bamboo wadding fabrics.

Methods
Databases in Google Scholar were searched for articles using keywords such as 'Sustainable Sanitary Napkins', 'Environment and Menstrual Hygiene', 'Biodegradable napkins', 'Nano-fibres for feminine hygiene'. Reports of companies and blogs were also referred for collating data relevant for the research about status of waste menace created by plastic pads and their collection in landfills. The data was reviewed and analysed for progress made over the last one decade in the area of biodegradable menstrual practices.

Results
Plastic pervades modern life- it poses problems, as once it is created, it does not get broken down. The single-use plastic sanitary napkins need to be substituted by more environment friendly and sustainable alternatives.
For better understanding, the different researched biodegradable materials have been divided into various categories:-

1) Biodegradable polymers and novel materials

The biodegradable polymers have offered a possible solution to plastic-disposal problems. Mohanty, Mishra and Hinrichsen reviewed the advances in natural fiber development, from genetic engineering and composite science perspective creating sustainable products from renewable resources. According to them, scientists have the real challenge in finding applications which would consume sufficiently large quantities of these materials to lead price reduction, allowing biodegradable polymers to compete economically in the market [1].

According to Anuradha Barman, Katkar and Asagekar, *Poly Lactic Acid (PLA) fibre* serves as a more biodegradable alternative to the plastic layer used in single-use, disposable sanitary napkins. Additional features of PLA such as anti-bacterial and non-toxicity characteristics pave way ahead for its use in hygiene products. However, research for overcoming high cost aspect of PLA can make it more desirable as an option in commercial sanitary napkins [2].

Further, Banu Ozgen reviews the possibility of using Polylactic Acid (PLA), *Tencel® SUN and Soybean protein fibres (SPF)* in different blend compositions, giving their applications and usage. The effects of fibre types on yarn properties such as-tenacity, fineness, moisture regain are discussed in the review article [3]. Interestingly, Soy protein fibre (SPF) is the only plant protein, man-made fibre, which is manufactured in China. It is a liquefied soy-protein that is extruded from soybean after extraction of oil and is then processed to produce fibres by using bioengineering technology. Reddy and Yang obtained fibres from soybean straw which could be suitable for use in textiles and other applications, as solutions to offer in the direction of sustainable materials [4].

Cellulose is the one of the most abundant natural polymers, found in nature as the main constituent of plants. Besides, *Cellulose-based hydrogels* are known to be superabsorbent materials as these are known to swell immensely and absorb water and other aqueous fluids. According to Bashari, and Shirwan *et al*., this has enabled widespread use of cellulose hydrogels at commercial levels. Some applications discussed in the paper include cellulose hydrogel being used for hygiene products such as diapers, tampons, panty liners, etc. [5].

Shibly H and Hossain M et.al have drawn a comparison of different aspects like absorbancy, wickability, etc for biodegradable materials such as *soya fabric, poly fabric and bamboo fabric* blended with natural fibres. Interestingly, *carboxy methyl cellulose* (CMC) had been experimented for layering purpose within these blended napkins. Different tests revealed that absorbancy gets greatly enhanced with such composition where *Sodium Alginate and CMC* are used in combination in the napkins. Further, coating the napkins with *Neem extract* yielded SAP free sanitary napkins, which provides an environmentally safe solution [6].

Sathish Kumar, Aarthi, M, *et al.* developed biodegradable, quality sanitary pads at affordable prices for schoolgirls and women. The highlight was use of *waste of loom* i.e., *Cotton fluff.* Cotton web hence made, showed a very high absorbancy of 470%. '*Neem and orange peel based nano colorants'* were coated on the sanitary pads to enhance the anti-bacterial characteristics [7].

Chandra S. S and his team from the Department of Chemical Engineering, IIT Hyderabad, used *nano-fibres* of *cellulose acetate biopolymer*, as core of sanitary napkins. Testing revealed that the napkins showed enhanced absorption, due to a greater surface area [8]. According to research findings as reported by Yadav S and team "these cellulose acetate (CA) nano fibers provide a better alternative to achieving enhanced absorbency even without adding SAP layer to sanitary napkins. The conclusion of the study was that these nano-fibre sanitary napkins without SAP can offer a safe solution to the sanitary waste disposal problem" [9].

Anuradha B, Katkar P.M and Asagekar S.D have suggested the use of the *Organic Cotton* in sanitary napkins. According to the team, this not only serves as a sustainable raw material, but also is skin-friendly and highly absorbant. *Organic cotton* is grown in a pesticide-free environment, which further helps to restrict the use of chemicals and paves way towards an environment friendly production process. As cotton fibre comes directly from nature, it degrades when disposed. The team also researched on Lenzing Company's *Lyocell fibre*, which is completely biodegradable and hydrophobic in nature with extra softness, for use as top sheet. The paper suggests that due to its enhanced moisture uptake there is reduced bacteria growth, hence making it a good choice in sustainable sanitary napkins [2].

Woollen fabric, as a backing material, has been used by women, for time immemorial, to absorb menstrual waste. When compared with fleece, it is less waterproof, however it is a strong backing option for those women who want a more natural fabric. However, wool is known to show felting shrinkage if not delt with care and certain skin types are found allergic to the woollen fabrics [10].

2) Miscellaneous fibres and their blends

Sparkle Sanitary napkins recommends the use of *Corn starch, Banana fibres and Bamboo fibres* for some interesting reasons**.** *Corn starch layer* in napkins, functions as a sustainable anti-leak bottom layer and a compostable alternative to plastic. Conventional pads use polyethylene plastic as bottom-layer in order to provide for the leak-proofing, which makes these napkins non-biodegradable. Another sustainable material for napkins as suggested by Sparkle, is the use of *Banana fibres*, which is procured from bark of the tree that had been earlier treated as an agro-waste. [11]. Studies suggest that Banana fibres are highly absorbant and use less fertilizers as compared to other natural fibres. Ishika Ghosh and team have reported in their review article, development of cheap and hygienic pads for rural ladies, using *Banana fibers* [12].

Further, *Bamboo fibres* are well known for their natural property of sterilization and bacteriostasis. This helps it to find wide usage as sanitary products, hygiene products etc. It is for this reason that, the finished bamboo products need not be added with any artificial synthesized antimicrobial agent, so it does not cause skin allergy, and at the same time, it also has competitive prices in the market**.** Rathod and Kolhatkar, have proposed in their research the use of bamboo fibres in different combinations for sanitary napkins. Properties of 100% bamboo & bamboo – cotton (50:50) blended yarn fabrics for sanitary pads were analysed. Overall, their experimental results indicated higher breaking strength, higher elongation, better tearing strength and overall better performance for 100% Bamboo fabric, though cover factor for Bamboo-Cotton (50:50) blended yarn was higher than other prototypes [13]. Willis, S. in her blog has proposed, *bamboo fleece* as an excellent absorbent yet thin material for core of cloth pad. She further suggests the use of Hemp fleece, due to its absorbent characteristics. However, it has a tendency to become stiff and uncomfortable while in use and develops an unpleasant odour over time [10].

Ishika Ghosh and team have drawn comparison of different aspects of sanitary pads made with Water Hyacinth and Hemp. Pads have also been developed using *Water hyacinth***,** which is a kind of weed. The fibre is extracted from its stem. They sanitary napkins hence created had been found to be cost-effective and biodegradable. Sustainable and absorbent Sanitary napkins have also been developed using Hemp, in the above study [12].

Kumar R et.al has tapped useful properties of Milkweed and its blend with Cotton in sanitary napkins. In the study, it was found that the *Milkweed fibre* shows very high absorption index. The napkins with the Milkweed fibre core were made using polyethylene and polypropylene as bottom and top layer respectively [14]. *Jute fibre* is a natural, eco-friendly fibre has also become popular for use especially in the barrier layer and absorbant core to make sanitary napkin layers super absorbent. The paper by Agbaku C. A, *et al*., sheds light on the aspect of Jute fibres characteristic as the most affordable natural fiber, second only to cotton in its production and uses [15]. In a research work done at IIT Kharagpur by Barman, Katkar and Asagekar, Jute fibre was used to substitute a cotton core sanitary pad which had 65-70% cellulose content and high water affinity. Further the advantages of having a jute core include, lower price and abundance availability especially in North East India [2].

3) Novel finish coatings on pads

Burman A, Katkar P and Asagekar S.D researched to produce herbal coated biodegradable sanitary napkins. The paper focuses on developing sanitary napkins, in varying blend compositions of natural fibres. These napkins were further coated with herbal layers of -*Curcuma longa and Azadirachta indica* [2]. Shibly M.M.H, *et al*. in their research, developed sanitary napkin samples with cheap raw materials and a coating of natural antimicrobial agents such as *Tulsi and Aloe Vera*. The napkins produced were both eco-friendly and economical [6].

4) Sustainable Pads developed form industrial wastes etc

Owing to the huge waste generated by textile industry and following the principles of sustainability, Uddin M, Tushar S.I and Sakib S constructed sanitary pads from *cotton knitwear industry waste.* The choice of material was such because affordable sustainable napkins could be created for under-privileged women in Bangladesh [16].

Lakshmi Murthy, Ph.D. scholar, IIT, Mumbai has discussed the *sustainable Uger fabric pads*. In her paper, Murthy researches the menstrual products used by women in South Rajasthan. For assessing sustainability, the PASS diagram has been used. There were two styles of pads developed- for light flow and heavy flow. Uger pads were found to be satisfactory as it looked into aspects of environment as well as livelihood, as the pads are handmade generating employment within the community [17]. Foster, J studied the menstrual practices and their management in low and middle income countries. Research had been carried out with materials which are both sustainable and low in cost -cotton terry cloth, hemp cloth and *bamboo wadding*. According to the researcher, bamboo wadding had high absorption and its easy availability in these countries, makes it a cheap source, however, with further research, extraction process once simplified can prove beneficial in its usage in sanitary napkins [18].

Conclusions

The progress over the past decade clearly indicates that sustainable alternatives are the way to move ahead in future, once the commercialization of the same takes place.

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विशेषांक

भारत के प्रथम स्वतंत्रता संग्राम में जनसंचार की एक नई प्रणाली के रूप में चपाती वितरण का अध्ययन

डॉ. अमृता शिल्पी[1]

सारांश

चपाती वितरण 1857 के प्रारंभ में हुआ एक ऐसा जन संचार अभियान था, जिसके बारे में ब्रिटिश अधिकारियों, इतिहासकारों और अन्य विद्वानों ने लिखा अवश्य है, परंतु वे इसके आशय, प्रकृति और प्रयोजन के बारे में एक निश्चयात्मक प्रमाण देने से चूक जाते हैं। 1857-58 के कई ब्रिटिश प्रशासनिक ब्योरों में 'चपाती' का विशिष्ट उल्लेख मिलता है। कुछ ने चपाती वितरण को संयोग भर माना, तो कुछ ने इसे गहरे षड्यंत्र का महत्त्वपूर्ण हिस्सा। चपाती वितरण क्या मात्र एक संयोग भर था? यदि हाँ, तो यह वितरण उन्हीं क्षेत्रों में क्यों हुआ, जहाँ स्वतंत्रता संग्राम की ज्वाला सबसे अधिक भड़की? यदि नहीं, तो साक्ष्य और अभिलेखों में कहीं भी उस गुप्त संदेश का कोई प्रमाण क्यों नहीं मिलता, जो इन चपातियों द्वारा प्रसारित हो रहा था? क्या इस समूचे प्रकरण की अनदेखी या अनभिज्ञता, ईस्ट इंडिया कंपनी की इतनी बड़ी भूल रही कि इससे जुड़े सभी साक्ष्यों को छिपा/मिटाकर इसे मात्र एक अंधविश्वास या संयोग का रूप दिया गया? जिस चपाती वितरण का संदर्भ ब्रिटिश संसद में प्रतिपक्ष के नेता डिजरायली के संसदीय संबोधन में गंभीर रूप से आता है, उसे मात्र संयोग मानना ऐतिहासिक चूक होगी। प्रस्तुत शोध पत्र में उपलब्ध साक्ष्यों, अभिलेखों और विद्वानों के वर्णन के आधार पर यह जानने का प्रयास किया गया है कि 1857 के स्वतंत्रता संग्राम में सूचना और प्रचार का एक सशक्त और उल्लेखनीय माध्यम 'चपाती' थी या नहीं?

संकेत शब्द : चपाती वितरण, 1857 का स्वतंत्रता संग्राम, सूचना प्रसार माध्यम, उपनिवेशवाद और साम्राज्यवाद

प्रस्तावना

ऐसे कई ब्योरे हैं, जिनमें 1857 के स्वतंत्रता संग्राम से पूर्व हुए चपाती वितरण को संदिग्ध रूप में देखा गया (थॉर्नहिल, 1884 तथा के., 1864-76)। गुप्त सूचना फैलाने के माध्यम के रूप में उन्हें स्वतंत्रता संग्राम के षड्यंत्र का अंश माना गया (वैग्नर, 2010; कैंपबेल, 1858; मैलेसन, 1891), पर चपाती के द्वारा क्या सूचना फैलाई गई, इसके बारे में कोई विश्वसनीय प्रमाण नहीं मिलता है (चौधरी, 1955; मजूमदार, 1957)। जिस प्रकरण ने ब्रिटिश संसद तक को हिला दिया हो, वह कोई आम घटना तो हो नहीं सकती। तो क्या प्रमाण का अभाव यह संकेत करता है कि चपाती वितरण ब्रिटिश प्रशासन और सूचना तंत्र की विफलता का परिचायक रहा? प्रमाणस्वरूप आज हम अनेक विवरणों से अनुमान लगा सकते हैं कि चपाती वितरण 1857 के स्वतंत्रता संग्राम का कितना महत्त्वपूर्ण प्रकरण रहा। चूँकि इतिहास लेखन एक निरंतर प्रक्रिया है, इसलिए 1857 से जुड़े हर घटनाक्रम का पुनरावलोकन आवश्यक हो जाता है। क्या गुप्त सूचना संचरण एवं सामाजिक-राजनीतिक जनजागरण के रूप में चपाती ने महत्त्वपूर्ण भूमिका निभाई? औपनिवेशिक सोच और दास मानसिकता से ऊपर उठकर इस संपूर्ण प्रकरण का स्वतंत्रता के प्रथम संग्राम के दक्ष साधन के रूप में मूल्यांकन करना आवश्यक है।

हर भारतीय के लिए स्वतंत्रता संग्राम के इतिहास में 1857 का विशेष स्थान है। अकादमिक जगत् में इसे अलग-अलग स्वरूप में देखा गया है। कुछ विद्वान इसे सिपाहियों का विद्रोह मानते हैं, कुछ क्षेत्रीय शासकों द्वारा रचित विप्लव और कुछ इसे कृषक आंदोलन का रूप देते हैं (स्टोक्स, 1969, 1980, 1986; सेन, 1958; रिजवी एवं भार्गव, 1957-61; चौधरी, 1965; पामर, 1966; बॉल, 1857; मेटकॉफ, 1898 एवं 2010; मुखर्जी, 1984; गुहा, 1983; रे, 1994; डेविड, 2002)। प्रस्तुत आलेख में 1857 को भारत के पहले स्वतंत्रता संग्राम के रूप में देखा गया है, जिसमें हर क्षेत्र, हर वर्ग, हर धर्म-जाति के भारतीयों की सहभागिता रही। यह संग्राम गवाह है उस देशप्रेम का, जिसमें साधारण व्यक्तियों ने अपने नायकों के नेतृत्व में असाधारण चरित्र का परिचय दिया और अँग्रेजी शासन को हिलाकर रख दिया। 10 मई, 1857 के सैनिक विद्रोह से बहुत पहले इस संग्राम की योजना और तैयारी हो रही थी, जो अंततोगत्वा प्रशासनिक और नैतिक रूप से अँग्रेजों की बहुत बड़ी पराजय का स्वरूप रहा। इस समर का परिणाम यह था कि ईस्ट इंडिया कंपनी को निकाल बाहर कर ब्रिटेन की महारानी ने शासन की बागडोर अपने हाथ में ले ली। समस्त भारत में विप्लव पैदा करने वाले इस संग्राम में कई अभिनव सूचना प्रसार माध्यमों का प्रयोग हुआ होगा, जिससे क्रांतिकारी न सिर्फ अँग्रेजों को चकमा देने में सफल हुए, बल्कि मीलों दूर तक संदेश प्रसारित भी कर पाए। अतः स्वतंत्रता संग्राम में लोक संचार माध्यमों पर शोध एवं विमर्श बड़ा ही प्रासंगिक विषय है।

वर्तमान वैश्वीकृत युग का सर्वाधिक सशक्त पहलू संचार माध्यम है। उत्कृष्ट तकनीक, विज्ञान और प्रौद्योगिकी का सर्वोच्च प्रदर्शन संचार माध्यमों को हर दिन बेहतर करता जा रहा है। लेकिन जिस काल की विवेचना हम कर रहे हैं वह आज से लगभग 160-170 वर्ष पूर्व का है। एक ऐसा समय जब न बिजली, न रेडियो, न टेलीफोन और न ही प्रचलित रूप से प्रकाशित समाचार पत्रों का व्यवहार था। व्यक्तिगत संवाद का माध्यम या तो हस्तलिखित पत्र या फिर मौखिक संदेश ही हुआ करते थे। आज की स्थिति से तुलना की जाए तो उस काल में लोक संचार के नाम पर ऐसा कोई भी सशक्त माध्यम नहीं था, जो लोगों तक संदेश पहुँचा सके, उन्हें

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जागरूक कर सके या फिर उन्हें एकत्र करके किसी जन जागरण, आंदोलन अथवा प्रदर्शन के लिए प्रेरित कर सके। ऐसी स्थिति में एक प्रश्न मन में स्वतः कौंधता है कि लोक संचार के वे क्या माध्यम रहे होंगे या फिर ऐसे कौन-कौन से अभिनव साधन रहे होंगे, जिनके कारण भारतवर्ष की जनता ने खुद को अत्याचारी, औपनिवेशिक शासन के विरुद्ध बार-बार संगठित किया, साम्राज्यवादी शक्तियों से लोहा लिया, जीते-हारे, पर संघर्ष की लौ को कभी बुझने नहीं दिया। प्रस्तुत शोध पत्र में 1857 के स्वतंत्रता संग्राम से पहले लोक संचार माध्यम के रूप में 'रोटी' या 'चपाती' वितरण की भूमिका का विश्लेषण करने का प्रयास किया गया है। क्या 1857 के संग्राम में सूचना और प्रचार का एक सशक्त और उल्लेखनीय माध्यम 'चपाती' थी? या नहीं? ब्रिटिश अधिकारियों, इतिहासकारों और साहित्यकारों ने चपाती वितरण को कई रूपों में देखा है। इस विषय में उनके मत भी भिन्न रहे हैं। कुछ इसे पूरी तरह अनदेखा करते हैं, कुछ इसे संयोग मात्र मानते हैं, कुछ के लिए यह अंधविश्वास और टोटका भर रहा और कुछ ने इसे एक बड़ी योजना या 'षड्यंत्र' का हिस्सा माना (डाउंस, 2000; गुहा, 1983; मजूमदार, 1957; रिजवी एवं भार्गव, 1957-61)। मत चाहे कुछ भी हों, पर इस तथ्य पर आम सहमति है कि चपातियाँ वितरित हुईं और इनके वितरण का कालखंड 1857 के संग्राम से ठीक पहले का था (बेली, 1993, पृ. 37)।

शोध प्रविधि

प्रस्तुत शोध पत्र भारतीय इतिहास के एक विशेष कालखंड 1857 में घटित एक अनन्य घटनाक्रम, चपाती वितरण पर किए गए शोध पर आधारित है। इस शोध में ऐतिहासिक अध्ययन विधि का प्रयोग किया गया है। विषय बोध हेतु राष्ट्रीय अभिलेखागार और नेहरू स्मारक पुस्तकालय में उपलब्ध प्राथमिक और द्वितीयक साहित्य की समीक्षा की गई है। इंटरनेट पर उपलब्ध दुर्लभ पुस्तकों का संकलन एवं अन्य संसाधन भी कोरोना काल में पूर्ण हुए इस शोध में सहायक रहे। इस विषय पर विद्वानों-इतिहासकारों द्वारा लिखी गई पुस्तकों, ब्रिटिश अधिकारियों द्वारा प्रस्तुत रिपोर्ट एवं आलेख तथा प्रत्यक्षदर्शियों एवं संग्राम से संबद्ध लोगों के बयानों के आधार पर शोध परिकल्पना एवं प्रश्नों को परखने का प्रयास किया गया है।

शोध परिकल्पना

1. 1857 के प्रथम स्वतंत्रता संग्राम में चपाती वितरण एक बड़ा ही महत्त्वपूर्ण घटनाक्रम रहा, जिसमें भारत के हर वर्ग, हर जाति, हर धर्म के लोगों ने अपनी सहभागिता की।
2. जनता को एकत्रित और जाग्रत करने में चपाती वितरण ने एक अभिनव लोक संचार माध्यम के रूप में भूमिका निभाई।

शोध प्रश्न

1. औपनिवेशिक काल में भारत में ब्रिटिश शासन, भूख और रोष का क्या संबंध था?
2. क्या चपाती वितरण एक सुनियोजित योजनाबद्ध जन संचार अभियान था, जो अँग्रेजों के विरुद्ध एक बड़े 'षड्यंत्र' का हिस्सा था?
3. चपाती जैसी साधारण खाद्य सामग्री आखिर इतनी महत्त्वपूर्ण कैसे बन गई कि उसका संचार माध्यम के रूप में भारत के स्वतंत्रता संग्राम में उपयोग किया गया?

इस क्रम में यह शोध पत्र चार खंडों में विभाजित है :

1. भूख, दरिद्रता, रोष और रोटी
2. चपाती जैसी साधारण भोजन वस्तु लोक संचार का माध्यम क्यों और कैसे बनी
3. देशज संचार माध्यमों से संबंधित साक्ष्य
4. लोक संचार माध्यम के रूप में चपाती वितरण का विश्लेषण

भूख, दरिद्रता, रोष और रोटी

भारत और यूरोप की राजनीतिक अर्थव्यस्था का तुलनात्मक विश्लेषण :

मोटे अनाज की बनी छोटी-मोटी चपातियाँ जो ब्रिटिश शासन के दौरान अधिकांश गरीब, भूखे भारतीयों को अकाल और भुखमरी से बचाती थीं, वे 1857 के प्रारंभ में अनायास संदिग्ध हो गईं (वैग्नर, 2010; डाउंस, 2000)। चपाती जैसी साधारण खाद्य सामग्री आखिर इतनी महत्त्वपूर्ण कैसे बन गई कि उसका संचार माध्यम के रूप में भारत के स्वतंत्रता संग्राम में उपयोग किया गया? इस प्रश्न का उत्तर जानने के लिए यह जानना आवश्यक है कि औपनिवेशिक काल में भारत में ब्रिटिश शासन और भूख का क्या कोई संबंध था? अठारहवीं सदी के प्रारंभ से भारत के सामाजिक, आर्थिक और राजनीतिक पतन के कारण ब्रिटिश साम्राज्यवाद और उपनिवेशवाद ही रहे (पानंदिकर, 1921; बकनन, 1966; सिन्हा, 1946; बनर्जी, 1982; साहू, 1985;)। 1760 से 1860 के दशक तक और उसके बाद भी हर दशक में हजारों-लाखों लोग अकाल और भुखमरी का शिकार बने (भाटिया, 1967; मैक ऑलपिन, 1983; डायसन, 1989; हॉल-मैथयुस, 2005; शर्मा, 2001; अर्नाल्ड, 1993; क्लीन, 1984; दामोदरन, 2007; मिश्रा, 2013)। विद्वानों का मत है कि उन्नीसवीं सदी के उत्तरार्ध में बार-बार पड़ने वाले अकाल के कारण प्राकृतिक नहीं, बल्कि राजनीतिक थे (डेविस, 2000)। अकाल से हुई सामूहिक मृत्यु, आपद और तबाही की जिम्मेदार साम्राज्यवादी राज्यों की विचारधारा और उनकी शोषक उपनिवेशवादी एवं पूँजीवादी नीतियाँ थीं (मैक ऑलपिन, 1983; डेविस, 2000)। कुछ विद्वानों का मत यह भी है कि पूर्व-औपनिवेशिक काल में जाति और संयुक्त परिवार प्रणाली में वृद्ध, अशक्त, निराश्रित, निर्धन आदि व्यक्तियों की देखभाल करने का दायित्व मुख्यतः समाज का था। इसमें राज्य को हस्तक्षेप करने की शायद ही कोई आवश्यकता थी। ब्रिटिश औपनिवेशिक शासनकाल ने आपसी सहायता और सामाजिक एकता के इस आदर्श को पूरी तरह नष्ट करके अभावों को अकाल में परिवर्तित कर दिया (भाटिया, 1975)।

भारत की समृद्धि और संपन्नता का विस्तृत उल्लेख विभिन्न अभिलेखों और साक्ष्यों में मिलता है (सुब्रह्मण्यम, 1990, 1990a, 1994; चौधरी, 1978 पृ. 185)। आक्रमणकारियों और विदेशी लुटेरों के द्वारा बार-बार भारत पर आक्रमण और लूटपाट का भी वर्णन इतिहासकारों ने विस्तारपूर्वक किया है, परंतु किसी भी विदेशी ने इस राष्ट्र की समृद्धि,

अखंडता और आर्थिक-सामाजिक-सांस्कृतिक ताने-बाने को उस प्रकार छिन्न-भिन्न नहीं किया, जैसा यूरोपीय उपनिवेशवाद की नीतियों ने किया (दत्त, 1900, नौरोजी, 1901; टैगोर, 1960, 1978)। इनके आगमन से पूर्व जितने भी लुटेरे या आक्रमणकारी आए, वे अपनी लोलुपता की तृप्ति के पश्चात् या तो वापस अपने क्षेत्र लौट गए या फिर भारत के होकर रह गए। इस राष्ट्र की उत्प्लावकता ऐसी रही कि इसने हर आघात के बाद अपनी संपन्नता को फिर से बना लिया, परंतु, लुब्ध उपनिवेशी शक्तियों की न तो क्षुधा शांत हुई और न ही इस राष्ट्र को उन्होंने अपने शासनकाल में पुनरुत्थित होने का मौका दिया। गोपाल कृष्ण गोखले, दादाभाई नौरोजी, फिरोजशाह मेहता आदि कई विद्वानों का मत रहा कि इसके परिणामस्वरूप जो भारतवर्ष कभी सोने की चिड़िया हुआ करता था वह चरम दरिद्रता, सामाजिक असंतुलन और राजनीतिक अधोगति को प्राप्त हुआ। हालाँकि इन प्रतिकूल परिस्थितियों में भी जनमानस का स्वाभिमान और आत्मा की स्वतंत्रता कभी क्षीण नहीं हुई।

उपनिवेशवाद के आशय को विस्तृत रूप से समझना आवश्यक है। ऐसे क्या कारण थे जिनकी वजह से उपनिवेशवाद की नीति यूरोपीय देशों ने अपनाई? क्यों भारत की खोज महत्त्वपूर्ण रही? क्यों यहाँ की राजनीतिक, आर्थिक और सांस्कृतिक-सामाजिक व्यवस्था को छिन्न-भिन्न करना इन तथाकथित साम्राज्यवादी शक्तियों के लिए अनिवार्य हो गया? समृद्धि से अकाल तक पहुँचने के कारण दरअसल भारत में नहीं, बल्कि यूरोप में मिलते हैं। यूरोप की राजनीतिक-आर्थिक व्यवस्था पर कई मार्क्सवादी और गैर-मार्क्सवादी विद्वानों ने अपने-अपने मत रखे हैं। यह बात बड़ी रोचक है कि विभिन्न मत आपस में ही अकादमिक विवाद को जन्म देते हैं। यूरोप की औद्योगिक क्रांति, जिसको आधुनिकता और विकास का परचम बनाकर, पश्चिमी सभ्यता को एक मॉडल के रूप में दिखाया जाता है, दरअसल उसका पर्दे के पीछे का स्वरूप मौरिस डॉब्ब, रोडनी हिल्टन, पॉल स्वीजी, एरिक हॉब्सबॉम आदि विद्वानों ने अपने लेखों में व्यक्त किया है।

यूरोपीय सामंतवादी व्यवस्था पूरी तरह से अयोग्य और अक्षम रही। चौदहवीं-पंद्रहवीं शताब्दी में यूरोपीय सामंती अर्थव्यवस्था बड़ी ही संकट की स्थिति में थी (पोस्टन, 1966; ब्रेनर, 1976)। उत्पादकता में कमी, राजस्व की बढ़ती जरूरतें, बढ़ते हुए कर, युद्ध, धर्म-युद्ध और लूटपाट में वृद्धि, सामंतों एवं शासकों की शान-शौकत एवं फिजूलखर्ची के कारण यूरोप की सामान्य जनता अत्यंत शोषित थी। सामंती प्रथा ने प्रजा पर हो रहे शोषण को और भी बढ़ाया (स्वीजी, डॉब्ब एवं अन्य, 1976)। औद्योगिक क्रांति ने उत्पादन के तरीकों को अवश्य बदला, पर सामाजिक-आर्थिक दुर्दशा को ठीक नहीं किया जा सका। एक ओर शोषक सामंती वर्ग के द्वारा यूरोप के ग्रामीण क्षेत्रों के प्रत्यक्ष उत्पादकों को लगान एवं विभिन्न प्रकार के करों से विदीर्ण किया जा रहा था। दूसरी ओर औद्योगिक क्रांति के बाद पूँजीवादी उत्पादन शैली शहरों में श्रमिकों की दुर्दशा का कारण बन रही थी। औद्योगिकीकरण और शहरीकरण के कारण समकालीन यूरोपीय समाज और भी अधिक दुर्दशा का सामना कर रहा था (मैनिंग, 1976)। इन सामाजिक-आर्थिक परिस्थितियों का सीधा संबंध यूरोपीय राज्य व्यवस्था से था। इंग्लैंड और फ्रांस में बड़े स्तर पर केंद्रीकृत राज्य विकसित हुए जो किसानों और जमींदारों के बीच हस्तक्षेप करते और काफी मात्रा में अधिशेष ऐंठने में कार्यरत रहते। इंग्लैंड का राष्ट्रीय केंद्रीकृत शासन तंत्र वास्तव में सामंत वर्गों पर ही निर्भर था। राज्य के समर्थन से सामंत वर्ग ने लगान और आर्थिक दंड बढ़ाए, जमीन मालिकों से प्रतिरोध को दबाया, किसान अपनी भूमि छोड़ने को मजबूर हुए और अंततः उद्योगों में मजदूरी करने को विवश हुए (थॉम्पसन, 1975; ब्रेनर, 1976)। उद्योगों को बढ़ाने के लिए संसाधन और फैक्ट्रियों में बनी वस्तुओं के लिए बाजार ऐसे दो कारण थे, जिनकी वजह से विश्व में और भी क्षेत्रों को ढूँढ़ निकालने का दबाव राज्य और व्यापार दोनों पर पड़ा। आर्थिक, सामाजिक और राजनीतिक दबाव के कारण समस्त यूरोपीय देश नई जगहों की खोज में निकल पड़े थे। ध्येय था लूटपाट और धर्मांतरण, चाहे जिस भी तरह हो।

इसी कालखंड में भारत की राजनीतिक, सामाजिक और आर्थिक स्थिति की समीक्षा करें तो साक्ष्यों से पता चलता है कि भारतवर्ष कंधार से दक्षिण पूर्व एशिया, हिमालय से भारतीय महासागर तक व्यापार का केंद्र था (मुखर्जी, 1967; फ्रैंक, 1996)। हर क्षेत्र की शासन व्यवस्था अधिकांशतः कार्यकुशल एवं सशक्त थी। आर्थिक रूप से भारत प्राचीन काल से ही रेशम, मसालों एवं कई और वस्तुओं के व्यापार और विनिमय का केंद्र रहा (मुखर्जी, 1915)। भारत भ्रमण पर आए यात्रियों के विवरण, विदेशी आक्रमणकारियों के वृतांत या फिर उस समय के शासकों के राजकीय अभिलेख इस तथ्य की पुष्टि करते हैं। कृषि और व्यापार दोनों ही क्षेत्रों में भारत समृद्ध था और लोकप्रिय किस्सों में भारत का संदर्भ 'सोने की चिड़िया' के रूप में दिखाई देता है। कहने का तात्पर्य यह है कि कुल मिलाकर भारत उस कालखंड में संपन्न और समृद्ध राष्ट्र था, जबकि यूरोप में राजनीतिक, सामाजिक और आर्थिक रूप से अराजकता फैली हुई थी और विभिन्न क्रांतियों के उपरांत समाज और उत्पादन व्यवस्था को संतुलित करने का प्रयास जारी था। ऐसे में भारत जैसी जगह यूरोपीय राज्यों के लिए किसी सोने-हीरे की खान से कम न थी। जितना खोदते उतना फायदा होता, परंतु भारत में पैठ बनाना उम्मीद से कहीं अधिक चुनौतीपूर्ण और कठिन साबित हुआ। फलस्वरूप सबसे आसान तरीका, जो यूरोपीय ताकतों ने अपनाया भी, वह था सामाजिक विघटन, आर्थिक नियंत्रण (जिसमें भारतीय उद्योगों का प्रतिबद्ध तरीके से खात्मा एक बड़ी योजना थी) और राजनीतिक प्रभुत्व, ताकि समय-समय पर बल एवं कानूनों द्वारा अपना वर्चस्व कायम रखा जा सके। उपनिवेश शासनकाल में पहली बार भारत में ऐसा हुआ कि सुनियोजित तरीके से भारत की अर्थव्यवस्था को तार-तार कर दिया गया। कृषि-उत्पाद का इस्तेमाल लगान उगाही एवं यूरोपीय उद्योगों के लिए संसाधनों की पूर्ति के लिए हुआ। वहीं दूसरी तरफ विदेशी उत्पादों के लिए बाजार को बनाने हेतु भारत के निजी उद्योगों को पूरी तरह से नष्ट कर दिया गया। किसान और कारीगर मजदूर बन गए और एक समय विश्व व्यापार पटल का चमकता सितारा भारत अपने लोगों की भूख शांत करने के लायक भी न रहा। उन्नीसवीं सदी के मध्य तक ग्रामीण क्षेत्रों में भूमिहीन दिहाड़ी मजदूरों का एक अलग वर्ग उभरा और बाद के दशकों में इनकी संख्या में कई गुना बढ़ोतरी हुई (भाटिया, 1975: पृ. 575-594)। समय-समय पर अँग्रेजों की शोषक नीतियों के विरोध में हुए किसान, जनजाति विद्रोह इस बात के प्रमाण हैं कि भारत के आम नागरिकों का रोष दिन-प्रतिदिन बढ़ता ही जा रहा था (चौधरी, 1955)।

दाने-दाने को तरसते लोगों को बाँधने में भूख की बड़ी भूमिका रही।

भूख, दरिद्रता और रोष का परिचायक रही रोटी। नाना साहेब और अन्य अधिनायकों ने संदेश पहुँचाने का इसे एक अभिनव साधन बनाया। आने वाले खंड में चपाती वितरण की प्रक्रिया और साक्ष्यों का विस्तृत वर्णन है।

चपाती जैसी साधारण भोजन वस्तु लोक संचार का माध्यम क्यों और कैसे बनी ?

1857 में चपाती का गुप्त वितरण

(*स्रोत: कैंपबेल. कॉलिन नैरेटिव ऑफ दी इंडियन रिवोल्ट फ्रॉम इट्स ऑउटब्रेक टू दी कैप्चर ऑफ लखनऊ* (लंदन, 1858). *पृ 3*)

चपाती जैसी साधारण वस्तु भला संदेश वाहक कैसे हो सकती है? चपाती वितरण आखिर संचार का माध्यम कैसे हो सकता है? इंदौर से इटावा तक; अलीगढ़, मेरठ, मथुरा होते हुए दिल्ली तक; नरसिंहपुर, जबलपुर, सागर और नौगाँव, बाँदा, फतेहपुर, फर्रुखाबाद, बदायूँ आदि में चपाती के चक्कर की सूचना ने ब्रिटिश प्रशासन को पूरी तरह से संभ्रमित कर दिया था (वैग्नर, 2010, पृ. 62-77)। कई इतिहासकारों और ब्रिटिश अधिकारियों का कथन है कि चपाती में न तो कोई गुप्त संदेश छिपा मिला न ही वितरण की प्रक्रिया को शासनाधिकारियों से छिपाने का प्रयास किया गया (थॉर्नहिल, 1884, पृ. 2)। अंधविश्वासों से ग्रस्त इस देश की जनता ने कई बार कई प्रकार के ऐसे टोटकों का इस्तेमाल महामारियों को रोकने या भगाने के लिए किया (केव-ब्राउन,1861 पृ. 1-2)। तो फिर 1856-57 में वितरित हुई चपातियों को लोक संचार माध्यम कैसे माना जा सकता है?

पर्याप्त साक्ष्यों और और गवाहों के अभाव में चपाती वितरण को क्या मात्र एक रहस्यमय संयोग माना जाए? यह मत अधिकांशतः उपनिवेशी सोच से मंत्रमुग्ध उन विद्वानों या अँग्रेज अधिकारियों का है, जो 1857 के संग्राम को मात्र एक सैनिक विद्रोह मानते हैं। साथ ही इस संभावना को भी नकारते हैं कि यह भारत का प्रथम स्वतंत्रता संग्राम था और योजनाबद्ध तरीके से पूरे देश में संयोजित हुआ। जॉन लॉरेंस (मजूमदार, 1957, पृ. 210-11), जो काफी समय तक ईस्ट इंडिया कंपनी में कार्यरत थे और 1864 से 1869 तक भारत के वायसराय भी रहे उनका कहना है—"यदि इस देश में सच में कोई षड्यंत्र था और वह षड्यंत्र सेना तक पहुँचा, तो इस बात की यथोचित व्याख्या किस प्रकार की जा सकती है कि जो लोग हमारे पक्ष में थे उनमें से कोई भी हालात से अवगत नहीं था? हमारे समर्थकों की संख्या विरोधियों की तुलना में चाहे जितनी कम हो, पर वास्तविक संख्या काफी थी। ये लोग हर आजमाइश में खरे उतरे, कुछ ने तो हमारे पक्ष में लड़ते हुए अपनी जान भी दे दी। इनमें से किसी ने भी किसी षड्यंत्र का कभी कोई जिक्र नहीं किया। षड्यंत्रकारियों ने, जिन्होंने अपने पाप का प्रायश्चित जान गवाँ कर किया, मेरी जानकारी के अनुसार कभी इस बात को नहीं स्वीकारा, जो कि निस्संदेह उनकी जान बचा सकता था।" मेटकॉफ (1995, पृ. 224) ने अपनी पुस्तक 'द न्यू कैंब्रिज हिस्ट्री ऑफ इंडिया' में लिखा है कि ब्रिटिश अधिकारियों का दावा रहा है कि 'विद्रोह' का कारण मुख्यतः चर्बी वाली गोलियों से पनपी उत्तेजना थी। अधिकारियों का दृढ़ विश्वास था कि जनता उनके पक्ष में थी और यह विद्रोह अंधविश्वासी सिपाहियों के बीच जातिगत मुद्दों पर मची मूर्खतापूर्ण भगदड़ के सिवा और कुछ भी नहीं था।

1857 के संग्राम के कुछ भारतीय प्रत्यक्षदर्शियों का भी यही मत है कि यह पूरा प्रकरण एक सैन्य विद्रोह था, जिसे दुर्घटना या विश्वासघात के रूप में देखा जाना चाहिए। सैयद अहमद खान ने विस्तार से इस बारे में अपनी किताब 'असबाब-ए-बगावत-ए-हिंद' (1858) में लिखा है (रावत, 2007, पृ. 20-23)। कॉल्विन और ग्राहम ने बाद में इस किताब का अनुवाद किया, शीर्षक था—द कॉसेस ऑफ इंडियन रिवोल्ट। यह किताब ब्रिटिश सांसदों को क्रांति के वास्तविक कारणों से अवगत कराने के लिए लिखी गई थी। खान का मत था कि यह गदर न तो कोई राष्ट्रीय आंदोलन था न ही किसी योजना के परिणामस्वरूप हुआ। यह सैनिकों की अवज्ञा का फल था, जो विद्रोह की भावना से नहीं, बल्कि धार्मिक पूर्वाग्रहों और अज्ञानता से ग्रसित होकर उन्होंने किया था। अपनी एक और किताब 'सरकशी-ए-जिला बिजनौर' (मेमॉयर ऑफ दी रिबेलियन इन डिस्ट्रिक्ट बिजनौर) में सैयद अहमद खान यहाँ तक कहते हैं कि 'इस पूरी अशांति का कारण भारतीयों की अँग्रेजों के प्रति कृतघ्नता है' (रावत, 2007, पृ. 20-23)। ऐसे में चपाती वितरण जैसी दीर्घकालिक गतिविधि को एक सोचा समझा योजनाबद्ध आंदोलन मानना तो असंभव प्रतीत होता है।

आर. सी. मजूमदार (1957, पृ. 210) जैसे इतिहासकार मानते हैं कि संग्राम के योजनाबद्ध या षड्यंत्र होने के पर्याप्त सबूत नहीं मिलते। मजूमदार लिखते हैं—"हमने देखा कि बहादुर शाह कोई भी ऐसा षड्यंत्र रचने में अक्षम थे। इस बात का रत्ती भर भी सबूत नहीं मिलता कि फारस या रूस ने अट्ठारह सौ सत्तावन की इस महान क्रांति में भाग लिया होगा। जहाँ तक नाना साहेब की बात है तो उनके षड्यंत्र रचने का समर्थन करता कोई भी सबूत बेहद कमजोर है और उसकी अविश्वसनीयता इतनी अधिक है कि कोई भी आलोचनावादी इतिहासकार इस बात की अवधारणा भी नहीं करेगा। झाँसी की रानी लक्ष्मीबाई या कुँवर सिंह जैसे तथाकथित षड्यंत्रकारियों का संभवतः ऐसे किसी षड्यंत्र से कोई लेना-देना नहीं था। हम मौलवी अहमदुल्लाह अथवा अवध के नवाब या बेगम के बारे में ऐसा कुछ भी नहीं जानते हैं, जो यह विश्वास दिला सके कि उनमें या तो ऐसी क्षमता थी या उन्हें अखिल भारतीय षड्यंत्र रचने का कोई अवसर मिला होगा।" चपाती वितरण के बारे में उनकी टिप्पणी है—"1856 -57 में एक बड़े स्तर पर चपाती वितरण जरूर एक पुख्ता और व्यापक व्यवस्थापन की ओर इशारा करता है, पर जब तक इस संचरण का अभिप्राय नहीं मालूम पड़ता तब तक वर्तमान संदर्भ में इसका कोई मूल्य नहीं है" (मजूमदार,

1957, पृ. 209)।

अगला प्रश्न यह है कि क्या सूचना तंत्र के रूप में व्यावहारिक तौर पर चपाती का संचार हुआ? क्या इसके माध्यम से कई अर्थ व्यक्त हुए और समाज में एक चेतना फैली? या फिर यह मात्र एक कोरा संदेश था? एक बार फिर हमारे समक्ष कई विवरण आते हैं।

क्या चपाती वितरण महामारी भगाने का एक टोटका या एक कोरा संदेश था?

19वीं शताब्दी में महामारियों का प्रकोप समूचे भारत में फैला हुआ था (रसल्ल, 1925; रोजर्स, 1927; रामसुब्बन, 1988)। लाखों लोग हैजा, चेचक आदि महामारियों के फैलने से काल के गाल में समा गए थे। विद्वानों का मत है कि भारत में महामारी को न सिर्फ स्वास्थ्य संकट के रूप में देखा जाना चाहिए, बल्कि इसके फैलने और रोकथाम के तरीकों का सांस्कृतिक-सामाजिक और राजनीतिक संदर्भ भी है। उपलब्ध आँकड़े बताते हैं कि 1865 से 1947 के बीच हैजा से लगभग 2.3 करोड़ भारतीयों की मौत हुई। 1817 से 1821 के बीच भारत में हैजा अत्यंत भयावह रूप में फैला (अर्नाल्ड, 1986, ने समकालीन ब्रिटिश स्वास्थ्य रिपोर्टों का विस्तृत ब्योरा अपने लेख में प्रस्तुत किया है)। 1831 में एक फ्रांसीसी डॉक्टर मोरियो दे जोंस (अर्नाल्ड, 1986, पृ.120) ने आँकड़े इकट्ठा किए, जिससे पता चलता है कि उस समय तक भारत की जनसंख्या का दसवाँ हिस्सा हैजा से प्रभावित हो चुका था और 1/16वाँ हिस्सा काल के गाल में समा चुका था। मोरियो के अनुमान के अनुसार 1817 से 1831 की अवधि में औसत वार्षिक मृत्यु दर लगभग 12.5 लाख की रही और कुल 1.8 करोड़ लोगों की इससे मृत्यु हुई। कुछ अन्य विद्वानों के आँकड़े इससे भी कहीं अधिक मृत्यु दर का दावा करते हैं। महामारियों के प्रकोप ने भुखमरी की निरंतर होती समस्याओं को और बढ़ा दिया। इसके अलावा कुछ विद्वानों का कहना है कि हैजा और ब्रिटिश राज के फैलने का भी संबंध लोगों के मन में रोष और घृणा भरता गया। 19वीं सदी की पहली महामारी भारत में ब्रिटिश विस्तारवाद के सबसे सक्रिय और निर्णायक चरण में फैली। 1817 के हैजा फैलने के समय ब्रिटिश 60 वर्षों से बंगाल में अपनी जड़ें जमा चुके थे और उत्तर-दक्षिण में अपना शासन फैला रहे थे। 1818 के जुलाई-अगस्त माह में जब फिर महामारी फैली तो उस समय मराठा और सिख साम्राज्य को अँग्रेजों ने पराजित किया (अर्नाल्ड, 1986, पृ. 126)। इसे एक तरह से ब्रिटिश आधिपत्य के विरुद्ध दीर्घकालीन सैनिक विरोध का अंत समझा गया। सामान्य जनता और सैनिकों के लिए और ब्रिटिश विस्तारवाद के बीच का संबंध अमंगलसूचक रहा।

इसके अलावा एक साझा धारणा यह भी रही कि हैजा की उत्पत्ति के जिम्मेदार अँग्रेज थे (अर्नाल्ड, 1993)। उन्होंने हिंदू धर्म द्वारा वर्जित कई मान्यताओं का उल्लंघन किया, साथ ही प्रथाओं के साथ छेड़छाड़ की। हैजा या चेचक जैसी महामारियों को उनके अनुपात एवं प्रकृति और पारंपरिक चिकित्सा के अप्रभावी होने के कारण दैवीय क्रोध व अप्रसन्नता के रूप में भी देखा गया। यही कारण था कि दैवीय शक्तियों को प्रसन्न करने के लिए समय-समय पर या फिर महामारी के खात्मे की प्रत्याशा में उसे रोकने के लिए टोटकों का प्रयोग, अनुष्ठान या बलिदान भारत के अलग-अलग क्षेत्रों में नियमित अंतराल पर देखा गया। उदाहरणस्वरूप 1818 में मुंबई प्रेसीडेंसी के ठाणे जिले में दो भैंसों को अजीब तरह से रँगकर गाँव-गाँव घुमाने की सूचना मिली। पूछताछ करने पर पाया गया कि हैजा महामारी को दूर करने के लिए गाँववालों ने यह किया था (अर्नाल्ड, 1993, पृ. 177)। उसी वर्ष इंदौर में चपातियाँ बाँटी गईं। मुंबई के गवर्नर जॉन मैलकम (1823) ने जयपुर से दक्कन तक नारियल बाँटने की घटना का विवरण दिया है, जिसके बारे में बाद में पता चला कि जयपुर के किसी ब्राह्मण ने पुत्र पैदा होने पर वह नारियल खुशी में बाँटे हैं।

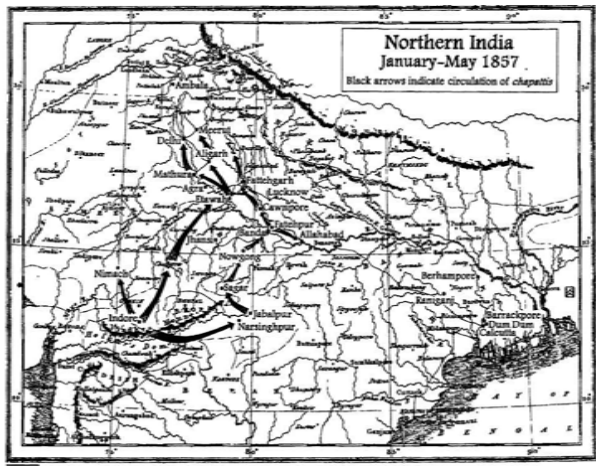
संग्राम के बाद भी इस प्रकार टोटके के रूप में बाँटने या प्रसारित होने के दृष्टांत मिलते हैं। 1858 में छिंदवाड़ा जिले के गाँव-गाँव में गेरुआ रंग की पताका में एक नारियल, एक सुपारी और एक पान का पत्ता बाँधकर घुमाया गया (मजूमदार,1957, पृ. 209)। 1860 के अप्रैल माह में अधिकारियों को घूरे के प्रचलन की सूचना मिली। घूरे में 215 पैसे, 160 कौड़ियाँ, धातु के बने 27 छल्ले और थोड़ा तंबाकू रखकर उत्तर प्रदेश, मध्य प्रदेश और राजस्थान के 90 सीमावर्ती गाँवों में घुमाया गया था। छानबीन पर पता चला कि यह फिर से हैजा से निपटने का तरीका था। हालाँकि अधिकारियों को सचेत रहने और तत्काल रिपोर्ट करने के आदेश मिल गए (अर्नाल्ड, 1986, पृ. 133)। तत्कालीन समाज में प्रचलित अंधविश्वास और महामारी के संदर्भ में कई विद्वान यह मानते हैं कि चपाती का वितरण आरंभिक रूप में टोटके की तरह ही हुआ, पर बाद में इससे कई मतलब जोड़े गए और अंततः यह एक रिक्त संदेश की तरह काफी समय तक वितरित होती रही। चपातियों का वितरण अँग्रेजों के प्रति भारत की जनता के बीच व्याप्त अविश्वास और भयाकुलता का लक्षण मात्र हो सकता है (गुहा, 1983, पृ. 238-46)। कई जगहों पर लिखा गया है कि चपाती संचरण की कोई सार्थकता नहीं है। यह समाज की आशंकाओं का प्रतिबिंब तो हो सकता है, पर 1857 के संग्राम का कारण नहीं।

क्या चपाती की अन्यत्रता ही उसकी विशेषता बनी?

क्या यह तर्क सही है कि कूटभाषा या संकेत लिपि के अभाव में चपाती का वितरित किया जाना संयोग मात्र हो सकता है? क्योंकि चपाती वितरण की गति, मार्ग की सुनिश्चितता (संग्राम का उपरिकेंद्र वे ही क्षेत्र थे, जिस मार्ग से चपाती वितरत हुई) और गवाहों एवं अधिकारियों के दृष्टांतों का एक ही दिशा की ओर संकेत साबित करता है कि यह पूरी प्रक्रिया सुनियोजित योजनाबद्ध आंदोलन का हिस्सा रही। उपनिवेशी सोच से प्रभावित ब्रिटिश अधिकारियों, इतिहासकारों और लेखकों का दृढ़ विचार रहा कि भारतवर्ष की जनता ऐसी अभिनव, संगठित और विलक्षण योजना को फलवती कर ही नहीं सकती। भूखे, निर्धन, धर्म-जाति में बँटे, अँग्रेजी ज्ञान से वंचित अंधविशवासी लोग ब्रिटेन जैसे महासाम्राज्य को उखाड़ फेंकने की योजना भला फलीभूत भी कैसे कर सकते थे? इस दंभ और अतिविश्वास का फल था कि ब्रिटिश अधिकारियों को 1857 में मुँह की खानी पड़ी। ब्रिटिश अधिकारी चपाती वितरण को लेकर इस कारण भी भ्रमित रहे, क्योंकि समय-समय पर चपाती, नारियल या किसी वस्तु का वितरण किसी अमंगल या अनिष्ट को दूर करने के लिए भी किया जाता था। उदाहरण के तौर पर नीमच में 1854 और 1857 में फैले हैजे को थामने के लिए कुत्तों को व्यापक रूप से चपाती खिलाने की घटना का उल्लेख है। 1857 में अवध में बीमारी फैलने पर चपाती वितरित की गई। 1857

में ही जहाँ दक्षिण दिल्ली में बकरी के माँस के साथ चपातियों का वितरण हुआ, वही बंगाल में मटके में बैंगन के फूल डालकर उसे चारों ओर घुमाया गया (वैग्नर, 2010, पृ. 65)। कहने का मतलब है कि आस्था अथवा अंधविश्वास के फैलने के माध्यमों का प्रयोग बड़ी ही विलक्षण सोच के साथ क्रांति के संचार के लिए किया गया।

क्या चपाती वितरण क्षेत्र की सुस्पष्टता, गति की तीव्रता और गोपनीयता इसके योजनाबद्ध होने का प्रमाण नहीं है?



(स्रोत : वैग्नर : 2010. मैप xxx)

चपाती वितरण की प्रक्रिया बड़ी ही रोचक थी। गाँव-गाँव में चौकीदारों के हाथ से इनका वितरण बड़े ही युक्तिपूर्ण तरीके से हुआ। एक चौकीदार 10 चपातियाँ बनाकर बगल के 5 गाँव के चौकीदारों को 2-2 चपातियाँ देता। चपातियों की संख्या 2 से 5 हो सकती थी। क्रमशः उस गाँव के निकट के अन्य पाँच-पाँच गाँवों में उसी तरह 2-2 चपातियाँ वितरित करनी थीं (वैग्नर, 2010; मजूमदार, 1957, पृ. 207)। वितरण की गति के बारे में कहा गया है कि ये चपातियाँ एक रात में 160 से 200 मील तक पहुँचाई जा सकती थीं (रिजवी एवं भार्गव, 1957-61)। विशेषज्ञों का मानना है कि 100 मील प्रति रात्रि की गति से अधिक वेग होना संभव नहीं था (रिजवी एवं भार्गव, 1957-61; के, 1864-76)। आँकड़ों का खेल चाहे जो भी हो, लेकिन 'द फ्रेंड ऑफ इंडिया' समाचार पत्र (5 मार्च, 1857) के अनुसार जिस वेग से इन चपातियों का वितरण हुआ वह किसी भी भारतीय डाक के लिए तो असंभव था। यह बहुत लंबा चला।

गति के साथ-साथ चपाती वितरण की गोपनीयता भी दृष्टांत के योग्य रही। चपाती वितरण करने वाले व्यक्ति को इसके स्रोत का या प्रयोजन का पता ही नहीं होता था। यह बड़ी ही रोचक बात है कि जिस सटीक मार्ग एवं गति से इसका वितरण हुआ, उसके लिए बिना कुछ जाने इतने व्यक्ति शामिल हुए और लक्ष्य की पूर्ति भी की। अलग-अलग स्थान, जो कि एक-दूसरे से सैकड़ों मील दूर थे; जैसे—नीमच, इंदौर, सागर, फतेहपुर, शाहजहाँपुर, दिल्ली आदि—इन स्थानों से जब चपाती बँटने की खबरें आईं तो ब्रिटिश शासन में खलबली मच गई (वैग्नर, 2010, पृ. 65)। एक भारतीय पुलिस अधिकारी को दिल्ली में छानबीन करने के लिए भेजा गया तो उसे किसी भी सवाल का जवाब न मिला। जैसे ये चपातियाँ कहाँ से आईं, उनका उद्देश्य क्या है? (मेटकॉफ, 2010 : मैनुद्दीन की गवाही)। सूचना के अभाव में अँग्रेजों ने अटकलें लगानी शुरू कर दीं और सबसे आसान अर्थ, जो वह निकाल सके, वह था अंधविश्वास और बीमारियों से भगाने के तरीके (केव-ब्राउन, 1861)। इस तरह की सफाई, जिसमें 'शुतुरमुर्ग की तरह रेत में गर्दन दबाने के पश्चात् निश्चिंत हो जाना कि बवंडर नहीं आ रहा', शायद संग्राम के आयोजनकारों के लिए भी उत्तम था। जितनी निश्चिंतता के साथ अँग्रेज हर सूचना-संचार को नजरअंदाज करते, उतनी ही सहजता के साथ योजना पूर्ण होती।

क्या विशेष प्रयोजन के सृजन और प्रचार के रूप में चपाती का संचार हुआ?

पूरे देश में ब्रिटिश अधिकारियों द्वारा चपाती वितरण के वृत्तांत मिलते हैं। निमाड़ जिले के अधिकारी कैप्टन आर. एच. कीटिंग (के, 1864-76; डनलप, 1858) का मंडलेश्वर में चपाती वितरण का लिखित प्रमाण मिलता है। उनका प्रलेख कहता है कि वितरण की सूचना उन्हें मिलने तक निमाड़ में लगभग हर जगह से चपाती आ चुकी थी। आगमन की दिशा इंदौर की ओर बताई जा रही थी। उस समय निमाड़ में जबरदस्त हैजा फैला था, जिससे हर दिन कई व्यक्तियों की मृत्यु हो रही थी। निमाड़ के निवासियों का मानना था कि यह महामारी फैलाने के लिए इंदौर में किया गया कोई जादू टोना जिम्मेदार था। वैसे निमाड़ में ऐसी वस्तुओं का वितरण कोई अपरिचित व्यवहार नहीं था। एक गाँव में जब भी चेचक फैलता है तो गाँव से एक बकरी के गले में नारियल बाँधकर अलग-अलग गाँवों में ग्रामीणों द्वारा मनदाता (मंदिर) पहुँचने तक उसे घुमाया जाता है। ग्रामीणों द्वारा उसका शहर में प्रवेश वर्जित होता है। ग्रामीणों के इस अंधविश्वास का कारण मनदाता मंदिर में हजारों यात्रियों की आवाजाही था, जिसके कारण जिले में महामारी फैलती थी।

1857 की जनवरी का ही एक और दृष्टांत मथुरा के मजिस्ट्रेट के विवरण में भी मिलता है—"एक दिन जब मैं अपने ऑफिस आया तो मैंने अपने टेबल पर चार छोटी-छोटी रोटियाँ रखी देखीं, बिस्कुट के आकार और मोटाई की चार सबसे मोटे अनाज की बनी गंदी रोटियाँ। एक व्यक्ति ने गाँव के चौकीदार को एक ऐसी रोटी इस आदेश के साथ दी कि वह चार और ऐसी ही रोटियाँ बनाए और बगल के गाँवों के चौकीदारों में बाँट दे। और उन्हें भी यही करने को कहे। चौकीदार ने बात तो मान ली, पर पुलिस को सूचना भी दे दी। अगले दिन जिले के दूसरे क्षेत्रों से भी ऐसी ही रिपोर्ट आई और फिर हमने समाचार पत्रों से जाना कि समूचे उत्तर भारत में इस प्रकार रोटियाँ वितरित की जा रही हैं" (थॉर्नहिल, 1884, पृ. 2)।

कॉलिन कैंपबेल अपनी 1858 में प्रकाशित पुस्तक में लिखते हैं—"कानपुर (Cawnpore) का एक चौकीदार दौड़ता हुआ फतेहगढ़ (Fytteyghur) के दूसरे चौकीदार को दो चपातियाँ देता है। यह अपाच्य और बेस्वाद चपातियाँ गरीब वर्ग का साधारण भोजन हैं। वह (चौकीदार) दूसरे को दस और चपातियाँ बनाकर इसी प्रकार पाँच गाँवों के चौकीदारों को दो-दो चपातियाँ वितरित करने का निर्देश देता है। इसका पालन होता है और कुछ ही समय में पूरा देश चपातियाँ लिए भागते चौकीदारों की हलचल से व्याकुल हो उठता है। जिस वेग से यह लहर प्रांत-दर-प्रांत फैली वैसी गति किसी भी आधिकारिक आदेश की कभी न रही। सारे मजिस्ट्रेट विवश थे और किसी को भी इसके आशय का अंदाजा न था। कुछ इसे हैजा भगाने की धर्म-क्रिया समझ रहे थे, कुछ इसे विश्वासघात मान रहे थे

('टाइम्स कोलकाता' के एक संवाददाता के अनुसार एक स्थानीय अफसर का यह मत था), कुछ इसे मजाक मान रहे थे। 'टाइम्स कोलकाता' के इस संवाददाता का भी यही मत था कि कुछ मूर्ख धनवान लोग कोलाहल मचाने की चाहत में यह बात फैला रहे थे। हालाँकि यह साबित हो गया कि यह किसी मूर्ख का काम नहीं था और न ही कोई मजाक। डिजरायली कहते हैं कि यह चपातियाँ विद्रोह के लगभग बारह महीने पहले से वितरित हो रही थीं। उस स्थिति में हम संदेह मात्र ही कर सकते हैं कि सरकार इतनी महत्त्वपूर्ण कार्यवाही से अनभिज्ञ थी, या फिर यदि अनभिज्ञ नहीं थी तो उसने इसके अर्थ की उपेक्षा की" (कैंपबेल, 1858, पृ. 4)। चपाती के बारे में कैंपबेल आगे कहते हैं कि यह अत्यंत प्राचीन चिह्न है। मकई और कमल के बीज की रोटी बनाकर मिश्र निवासी ईसिस देवी को अर्पण करते थे। यह उर्वरता और विपुलता की देवी है।

हर ब्रिटिश अधिकारी ने इस सूचना को संयोग या मजाक के रूप में नहीं लिया। दिल्ली में थियोफिलस मेटकॉफ (वैग्नर, 2010) ने ऐसे वितरण को निर्दोष और टोटका मात्र होने के तर्क को सिरे से खारिज कर दिया। उनकी जाँच ने इंगित किया कि चपातियाँ बस उन्हीं क्षेत्रों में वितरित की गईं जहाँ कंपनी का आधिपत्य था। जाहिर है उनका यह मत रहा कि इस वितरण प्रक्रिया के पीछे ब्रिटिश विरोधी उद्देश्य था। मेटकॉफ और कुछ अन्य अधिकारियों की पूरी कोशिश रही कि इस वितरण प्रक्रिया को रोक दिया जाए, फिर भी यह मेरठ तक पहुँच ही गई। चपाती का संदर्भ 10 मई, 1857 के बाद अचानक बदल गया। एक नए रूप में इस पूरे घटनाक्रम का विश्लेषण हुआ और पाया गया कि इस घटना के संचालन में जबरदस्त समन्वय और नियोजन रहा और अधिकारियों को भनक भी न लगने पाई। ब्रिटिश अधिकारियों ने क्षेत्र की समझ रखने वाले अनुभवी स्थानीय अधिकारियों की चेतावनी को अनदेखा किया। कई लोग इसे 'षड्यंत्र के सिद्धांत' के रूप में भी देखते हैं। इनमें प्रमुख नाम आता है कर्नल जी. बी. मैलसन का। अपनी पुस्तक 'द इंडियन म्युटिनी ऑफ 1857' में मैलसन लिखते हैं—"अट्ठारह सौ सत्तावन की घटनाएँ, जो कि तत्क्षण प्रतीत होती हैं, वास्तव में कहीं अधिक भयावह थीं।'' उन्होंने यहाँ तक कहा है—"जो लोग उस ड्रामे में शामिल थे, वे मरते दम तक नहीं समझ पाएँगे कि यह एक विद्रोह नहीं था जिसका उन्हें सामना करना था, बल्कि यह एक सुविस्तृत षड्यंत्र था, जिसके धागे व्यापक रूप से फैले हुए थे" (के. एवं मैलसन, 1888-89, पृ. 33)। मैलसन एक स्थानीय मुखबिर की गवाही को आधार मानते हुए फैजाबाद के एक मौलवी अहमदुल्लाह (जो कि संग्राम का अगुवा था) के बारे में लिखते हैं—"इस बात पर कम ही संदेह है कि यह व्यक्ति इस षड्यंत्र का दिमाग और बाजू था। अपनी यात्राओं के दौरान इसने एक योजना बनाई जो कि चपाती योजना के रूप में जानी गई....जब ब्रिटिश सरकार के अंतर्गत कार्यरत सशस्त्र व्यक्तियों को प्रभावित करने के तरीके इतने परिपक्व रहे कि पूर्व निर्धारित दिन पर सारे एक साथ उठ खड़े होंगे, उत्तर पश्चिमी प्रांतों की ग्रामीण जनसंख्या को चपाती वितरण के माध्यम से सूचित कर दिया जाएगा कि पहला अनुकूल अवसर मिलते ही एक महान विद्रोह होगा" (मैलसन, 1891, पृ.18)।

इस संग्राम के पश्चात् सैकड़ों वृत्तांतों, चरित्र-रचनाओं और कथाओं में षड्यंत्र और गुप्त संकेतों का उल्लेख मिलता है। कुछ चपाती वितरण को काल्पनिक मानते हैं, कुछ इसे 'संग्राम रूपांकन' के रूप में देखते हैं और कुछ मानते हैं कि यह मात्र टोटका भर था। एक और सरकारी दस्तावेज चपाती प्रकरण को बिल्कुल नई व्याख्या प्रदान करता है। 'ट्रायल ऑफ मोहम्मद बहादुर शाह' (नय्यर, 2007) में सीताराम बावा की आत्म-स्वीकृति का संदर्भ है, जिसमें कहा गया है—"जिन चपातियों की बात की गई है, वे वास्तव में एक जादू या टोटका थीं, जिनकी उत्पत्ति दस्सा बावा से हुई। उन्होंने नाना साहेब को यह कहा था कि वे एक जादू करेंगे और जितनी दूर तक यह रोटियाँ जाएँगी उतनी दूर तक लोग उनके साथ खड़े होंगे। उसके बाद उन्होंने कमल का सरकंडा और मखाना लिया और उसकी एक प्रतिमा बनाई। फिर उस प्रतिमा के बहुत छोटे-छोटे टुकड़े करके असंख्य रोटियाँ बनाईं और यह टुकड़े उनमें डाल दिए। जितनी दूर तक ये रोटियाँ आ जातीं, उतनी दूर तक लोग कंपनी राज को उखाड़ फेंकने का निश्चय कर लेते" (सेन, 1958, मजूमदार, 1957)।

भारतीय सिपाहियों में भी चपाती वितरण की खबर एक अलग संदेश के रूप में पहुँची। एक ब्रिटिश अधिकारी का ब्योरा इस प्रकार है—"मैंने उनसे पूछा कि इस संदर्भ में उनकी क्या समझ है और किसके द्वारा इनका वितरण हो रहा है; उन्होंने बताया कि ये बिस्कुट के आकार-प्रकार की थीं और सरकार के आदेश पर इनका वितरण लोगों को यह समझाने के लिए हो रहा था कि उन्हें एक तरह का भोजन ही अब खाने को मिलेगा और यह एक संकेत था कि अब उन्हें एक धर्म ही अपनाना पड़ेगा, जैसा कि उन्होंने कहा एक भोजन एक धर्म।" (नय्यर, 2007, पृ. 30, 83)। नौगाँव के एक ब्रिटिश अधिकारी की टिप्पणी है—"चपातियों का वितरण सबसे नीची जाति के लोगों के हाथों हो रहा था; लोगों का कहना है कि सरकार की मंशा मुखिया को बलपूर्वक या प्रलोभन देकर इन्हें खिलाना था, ताकि उनकी जाति भ्रष्ट हो जाए" (रे, 1994, पृ. 232)।

समकालीन समाचार पत्रों में चपाती वितरण की घटना को गंभीर रूप से देखा गया। मार्च 1857 में 'द फ्रेंड ऑफ इंडिया' (5 मार्च, 1857) समाचार पत्र ने वितरण की प्रकृति में गुणोत्तर वृद्धि का विवरण दिया। वहीं दूसरे समाचार पत्र ने षड्यंत्र का हवाला दिया—"भारत में षड्यंत्र संभव है पर गुप्त समितियाँ नहीं, एक बार फिर से यह अनुमान गलत साबित हुआ है। क्या सारे चौकीदार भत्ते के लिए हड़ताल करने वाले हैं? या फिर कोई पार्सल डाक की नई स्कीम चलाने की कोशिश कर रहा है? क्या यह राजद्रोह है या फिर एक मजाक? क्या 'भावनाओं का विस्फोट' होने वाला है या फिर सिर्फ हँसी का?" हफ्ते भर बाद वही समाचार पत्र फिर लिखता है—"बिना किसी कारण 90,000 आलसी पुलिस वाले, चौकीदार, खुद को कष्ट नहीं देंगे" (द फ्रेंड ऑफ इंडिया 19 मार्च, 1857)। कुछ का यह मत था कि चपाती वितरण अँग्रेज सरकार के आदेश पर हो रहा है, क्योंकि अँग्रेज अब लोगों का भोजन, धर्म और सामाजिक प्रतिष्ठा में भी हस्तक्षेप करना चाह रहे हैं और ईसाई धर्म अपनाने को मजबूर करेंगे (नय्यर, 2007 : पृ. 183)। वितरण के मुख्य कर्ता कुछ चौकीदारों का यहाँ तक मानना था कि सारी प्रक्रिया सरकार के निर्देश पर हो रही है। कुछ जगहों पर तो चपाती वितरित करने के बाद गाँव के पटवारी और स्थानीय पुलिस अफसर से प्रमाणित कराने का भी संदर्भ मिलता है। इसका संबंध महामारी की रोकथाम के लिए दवाएँ पहुँचाने में चौकीदारों की भूमिका से भी हो सकता है। चपाती वितरण को सिपाहियों एवं अन्य कई वर्गों ने अँग्रेजों द्वारा उनका धर्म भ्रष्ट करने के प्रयोजन के रूप में भी देखा (रे, 1994, पृ. 232)।

क्या चपाती वितरण एक सुनियोजित योजनाबद्ध आंदोलन था, जो एक बड़े 'षड्यंत्र' का हिस्सा था?

कुछ विद्वानों का मत है कि जिस तरीके से 1857 का संग्राम पूरे भारत में फैला और उसने अँग्रेजी सरकार को हिलाकर रख दिया, वह निःसंदेह एक सुदृढ़ योजना का हिस्सा था। 1907-1908 में प्रकाशित वी. डी. सावरकर की किताब '1857 का स्वातंत्र्य समर' उन्हीं सूत्रों का हवाला देती है, जिनमें संग्राम से संबंधित सभी सबूतों और गवाहों का विस्तृत उल्लेख है। चपाती वितरण के बारे में उनका कहना है—"इस विचित्र रोटी को कुछ पगले अँग्रेज अधिकारियों ने पकड़-पकड़ कर उसका चूरा किया और फिर उस चूरे का भी चूरा बनाकर उससे कुछ कहलवाने के प्रयास किए, परंतु किसी चुड़ैल की तरह उस चपाती को बोलने को कहते ही वह अपने मुँह की जीभ ही नष्ट कर देती और जिससे मन होता उसी से बोलती। वह रोटी गेहूँ या बाजरे के आटे की बनी होती थी। उस पर यद्यपि कुछ भी लिखा हुआ नहीं होता था, फिर भी वह हाथ में आते ही, उसका स्पर्श होते ही हर व्यक्ति की देह में क्रांति चेतना संचार करने लगती। हर गाँव के मुखिया के पास वे रोटियाँ आतीं। वह स्वयं उसका एक टुकड़ा खाता और उसको प्रसाद के रूप में सारे गाँव में बाँट देता। फिर उतनी ही ताजी रोटियाँ बनाकर गाँववाले पड़ोस के गाँव में भिजवा देते" (पृ 91)। इस प्रकार एक प्रज्जवलित मशाल की भाँति समस्त भारत में घूमते हुए हर गाँव में यह (संग्राम की) लौ जलाती गई।

1857 का संग्राम एक दीर्घकालीन आंदोलन का परमोत्कर्ष रहा। छल और बल से ईस्ट इंडिया कंपनी ने जहाँ-जहाँ अपनी जड़ें फैलाईं, वहाँ-वहाँ उसे जनता के रोष और विद्रोह का सामना करना पड़ा। प्लासी युद्ध के उपरांत एक भी ऐसा दशक नहीं था, जब भारत की विभिन्न दिशाओं से विरोध की ज्वाला न दहकी हो। 1857 से पूर्व कई क्षेत्रों से खबरें आईं कि प्लासी युद्ध के 100 वर्ष पूरे होते ही अँग्रेजों के शासन का अंत हो जाएगा (वैग्नर, 2010, पृ. 74; नय्यर, 2007, पृ. 16, 24, 111)। ब्रिटिश अधिकारी जी. डी. ट्रेवल्यन लिखते हैं—"हम अभी तक निस्संदेह मूल प्रकृति तक नहीं पहुँच पाए हैं। हर दिन सबके सामने प्रकट होते हैं जो निर्विवाद रूप से यह साबित करते हैं कि ...इस प्रकृति की गहराई साधारण रूप से नहीं समझी जा सकती है, न ही उन मापदंडों से समझी जा सकती है, जिससे कि हम यूरोपीय समंदर में नौसंचालन करते हैं। मिसाल के तौर पर महान विद्रोह के पूर्व हुए उन असाधारण चिह्नों को ही लीजिए, उस योजना का अद्भुत संचालन; विद्रोहियों और स्वतंत्र स्थानीय शक्तियों के बीच का रहस्यमय पर घनिष्ठ संबंध; धुँधली भविष्यवाणियाँ; खौफनाक अफवाहें, जिन्होंने विद्रोह का पूर्वाभास दिया; गोपनीयता; एकता; टोटके, जो लाखों गाँवों में हाथों-हाथ पहुँचाए गए" (ट्रेवल्यन, 1866, पृ. 429; वैग्नर, 2010, पृ. 7)। चपाती वितरण को संग्राम का एक महत्त्वपूर्ण अंग मानते हुए कोलिन कैंपबेल ने अपनी किताब 'नैरेटिव ऑफ द इंडियन रिवोल्ट फ्रॉम इट्स ऑउटब्रेक टू द कैप्चर ऑफ लखनऊ' में आधिकारिक पत्रों, चश्मदीद गवाहों के बयानों और संस्मरण पर आधारित साक्ष्य सामने रखे हैं। उनका मानना है कि चपाती वितरण संग्राम की पूरी योजना का एक महत्त्वपूर्ण हिस्सा था। अज्ञानता या लापरवाही के कारण सरकार इतनी महत्त्वपूर्ण घटना का आशय न समझ पाई और इस पूरे विद्रोह को रोकने में असफल रही (पृ० 4-2)।

जे. डब्लू. के., जिन्हें आधिकारिक रूप से अट्ठारह सौ सत्तावन की घटना का इतिहासकार माना जाता है, अपने वृत्तांत 'हिस्ट्री ऑफ सेपॉय वॉर इन इंडिया' (1864-76), में लिखते हैं कि संग्राम की सुदृढ़ योजना में नाना साहेब की भूमिका, राजकाज से बेदखल किए गए अन्य शासकों की भूमिका को नकारा नहीं जा सकता। हालाँकि के. (Kaye) ने शब्दों और दावों का चयन बड़ी सावधानी के साथ किया है, पर फिर भी उनका इशारा एक सोची-समझी साजिश की तरफ ही जाता है। के. की मृत्यु के बाद उनकी पुस्तक को पूरा करने वाले जी. बी. मैलसन अपने शब्दों और विचारों को स्पष्ट रूप से व्यक्त करते हैं। उनके अनुसार यह संग्राम एक योजनाबद्ध षड्यंत्र का नतीजा था, जिसके प्रणेता नाना साहेब, रानी लक्ष्मीबाई के साथ ऐसे कई शासक रहे, जिनके हाथ से उनका राज्य अँग्रेजों ने छीन लिया था। सैनिकों में पहले से ही ब्रिटिश शासकों के प्रति रोष था और आम जनता लगान के भार से तड़प रही थी। धर्म आधारित अंधविश्वासों और जातिगत पूर्वाग्रहों को हवा देकर इन सबने अखिल भारतीय संग्राम को फलीभूत किया। चपाती वितरण पर भी मैलसन पूरी तरह विश्वस्त हैं कि यह एक बड़ी योजना का हिस्सा था और गाँव-गाँव संदेश पहुँचाने का साधन। 1857 के संग्राम ने ब्रिटिश संसद को भी हिला दिया। प्रतिपक्ष नेता बेंजामिन डिजरायली (जो बाद में प्रधानमंत्री भी बने) ने भरी संसद में सवाल उठाया कि क्या यह केवल सैनिक विद्रोह था या फिर राष्ट्रीय आंदोलन? उनका मत था कि परिस्थितियों का अवलोकन करने के बाद सिपाहियों के इस बरताव को आकस्मिक उत्तेजना के रूप में देखा जाना उचित नहीं है। यह एक योजनाबद्ध साजिश थी, जो कि एक सही मौके की ताक में काफी समय से रची जा रही थी। उन्होंने 1857 की घटना का कारण मात्र चर्बीवाली गोलियों को मानने से इनकार कर दिया। डिजरायली के अनुसार स्थानीय प्रभुत्व का विध्वंस, संपत्ति अधिकारों और धर्म से छेड़छाड़ इतने बड़े विद्रोह का कारण बने (रावत, 2007, पृ. 16)। कोलिन कैंपबेल ने अपनी किताब में लिखा है कि डिजरायली ने यह दावा किया कि चपाती वितरण विद्रोह के लगभग बारह महीने पहले से चल रहा था। ब्रिटिश संसद में डिजरायली की बात पर भारी हंगामा हुआ और उनके बयान के ऊपर काफी टिप्पणी भी की गई। डिजरायली को अंततः यह मानना पड़ा कि यह विद्रोह सही नहीं था और भारतीय सैनिकों और लोगों की कृतघ्नता का परिचायक था। इसके बावजूद वे अपनी इस बात पर कायम रहे कि इस विद्रोह का कारण मात्र सैनिकों का रोष, चर्बीवाली गोलियाँ या फिर कोई छोटा-मोटा कारण नहीं थे, बल्कि इस विद्रोह के पीछे सोची-समझी और योजनाबद्ध तरीके से गई साजिश थी।

देशज संचार माध्यमों से संबंधित साक्ष्य

दरअसल भारत में पहले भी अँग्रेजों को गुप्त सूचनाओं के संचार का आभास तो हुआ, पर संचार के माध्यम और लोकभाषा की समझ का अभाव होने के कारण वे कुछ कर नहीं पाए (बेली, 1996)। औपनिवेशिक प्रशासन निरंतर इस भय से से ग्रस्त रहता कि स्थानीय निवासी गुप्त और रहस्यमई योजनाएँ बना रहे हैं, जो कि उनकी समझ से परे हैं (वैग्नर, 2010, पृ. 63)। उदाहरणस्वरूप जंगलों में ढोल की थाप हमेशा ब्रिटिश अधिकारियों को किसी गुप्त संकेत की संभावना से व्याकुल करती रहती थी। ठगों के गुप्त संजाल और उनके सूचनाओं के संचार की फूर्ति के बारे में तो ब्रिटिश अधिकारियों ने विस्तार से लिखा है (बेली, 1993, पृ.4-10)।

1806 का वेल्लोर विद्रोह ऐसे ही गुप्त संचार माध्यम द्वारा फलीभूत हुआ। इस विद्रोह में फकीरों ने केंद्रीय भूमिका निभाई। सामान्य जनता से लेकर सिपाहियों को सूचना पहुँचाने का काम इन्हीं का था। गोपनीयता की शपथ में बँधे ये फकीर, सन्न्यासी और आम नागरिक एक भी खबर को अँग्रेजों तक नहीं पहुँचने देते। गोपनीयता के साथ सूचना संचार माध्यम की फूर्ति भी हमेशा अँग्रेजों को व्यथित करती रही (चिन्नईयन, 1980)। इस विद्रोह में सूचना संचार के माध्यम के रूप में रोटी का वितरण हुआ और बहुत प्रयास करने पर भी अँग्रेज कुछ सिद्ध नहीं कर पाए (वैग्नर, 2010, पृ. 63)। बाजरा एवं रोटी का वितरण मराठा युद्ध के दौरान भी हुआ था। 1831-32 के कोल जनजाति विद्रोह या फिर 1855 -56 के संथाल विद्रोह में टहनियों या छोटी डालियों का प्रयोग संगठन के संकेत के रूप में हुआ था (वैग्नर, 2010, पृ. 63)।

संचार के देशज मॉडलों की रहस्यमयता की व्याख्या करते हुए के. कहते हैं—"हम बाह्य रूप, चमड़ी के रंग, कपड़े और पहनावे, घरों के बाह्य स्वरूप के अलावा स्थानीय भारतीय समाज के बारे में इतना कम जानते हैं कि इतिहास के क्रम में हम सिर्फ परिणाम और उनके कारणों का अनुमान ही लगा सकते हैं। कुछ अनुमान पूर्ण सत्य से थोड़ा कम ही होते हैं। जो हम देख नहीं पाते उन्हें महसूस कर सकते हैं और जिनको सत्यापित नहीं कर पाते उन पर विश्वास करते हैं। यह सत्य है कि एक तरीके का समाचार विद्युत गति से पूरे भारत में एक केंद्र से दूसरे केंद्र तक फैलता है। कई बार अँग्रेजों के संबंध में कोई विनाशकारी गुप्त सूचना 'विद्युत डाक' की तरह स्थानीय व्यापारियों के बाजारों और स्थानीय सेनावास में, उच्च सरकारी अधिकारियों तक पहुँचने से पहले ही, प्रचारित हो जाती है। हमें इन अमंगलकारी (सूचना) प्रवाह का सुराग तक नहीं मिलता" (बेली, 1993, पृ. 4)। 1857 की शुरुआत में चपातियों का वितरण भी जिस फुर्ती के साथ हुआ, उसके बारे में एक अफसर का कथन है कि हर दिशा में गजब वेग से संकेत का प्रसार हुआ। जब तक एक जिले में इसके वितरण की सूचना अधिकारियों तक पहुँचती तब तक यह वितरण आगे बढ़ चुका होता। इसे स्वदेशी संचार के माध्यमों में स्पष्ट रूप से एक दक्ष तरीका माना जा सकता है, जो कि औपनिवेशिक प्रशासन की समझ की क्षमता से परे था।

लोक संचार माध्यम के रूप में चपाती वितरण का विश्लेषण

किसी भी राजनीतिक परिवर्तन में लोक संचार की भूमिका अत्यंत महत्त्वपूर्ण रही है। कोई भी आंदोलन जनता की सहभागिता, संवेदना, एकजुटता और लक्ष्य की स्पष्टता के बिना आयोजित नहीं हो सकता। यह भी सच है कि कोई भी जन आंदोलन बिना सशक्त लोक संचार माध्यम के कभी सफल नहीं रहा। लोक संचार का माध्यम बहुधा सरल, प्रत्यक्ष और पहचान योग्य होता है, ताकि सामान्य जनता उससे जुड़ सके। ऐसे पारंपरिक और लोकप्रिय माध्यमों में नाटक-नौटंकी, गीत-संगीत आदि बड़े सफल मने गए हैं। चपाती ने एक अलग ही निमित्त का प्रचार किया। अरस्तू ने 'फिजिक्स और मेटाफिजिक्स' नामक अपनी पुस्तकों में चार कारणों (निमित्त) की परस्पर अंतःक्रिया की व्याख्या की है : भौतिक कारण **(causa materialis/material cause), कार्यसाधक/गतिमान कारण (causa efficiens/efficient cause), औपचारिक कारण (causa formalis/formal cause), और अंतिम कारण (causa finalis/final cause) (फुक्स, 20**20, पृ. 77)। संचार में, व्यक्ति विशेष (कार्यसाधक/गतिमान कारण efficient cause) संचार प्रक्रिया के (औपचारिक कारण (formal cause) कुछ विशेष साधनों का उपयोग करते हुए संस्कृति को विचारों और अर्थों की समग्रता देने का प्रयास करते हैं, ताकि (भौतिक कारण material cause) एक नए रूप में विशिष्ट सामाजिक संबंध और समाज (पुनः) उत्पादित (अंतिम कारण final cause) हो सकें।

चपाती वितरण प्रकरण का गहन अध्ययन किया जाय तो संचार के संबंध में अरस्तू का उपर्युक्त सिद्धांत सही प्रतीत होता है। संग्राम के योजनाकारों ने चपाती को भारतीय संस्कृति से जोड़ते हुए शोषक और दमनकारी उपनिवेशी नीतियों के विरुद्ध आंदोलन के विचारों और अर्थों को समग्रता देने का प्रयास किया, ताकि एक नए स्वतंत्र रूप में विशिष्ट सामाजिक संबंध और समाज (पुनः) उत्पादित हो सकें। संक्षिप्त रूप में कहा जाए तो सामाजिक, आर्थिक एवं राजनीतिक रूप में 'स्व' और स्वतंत्रता के ध्येय को पूरा करने का माध्यम चपाती वितरण बना। संग्राम के योजनाकारों ने एक ओर सामान्य, निर्धन एवं ग्रामीण जनता को चपाती वितरण के माध्यम से किसी बड़ी घटना के लिए तैयार किया, वहीं दूसरी ओर विश्वस्त योजनाकारों तक सूचना भी पहुँचाई। समस्त प्रकरण की गुप्तता इतनी विश्वसनीय रही कि अँग्रेजों को कुछ भी पता नहीं चला। यह पूरा प्रकरण उनके लिए इतना शर्मनाक रहा कि कभी प्रकट रूप से उन्होंने इस अभिनव लोक संचार माध्यम को नहीं स्वीकारा। इतिहास लेखन में विदेशी एवं दास मानसिकता से ग्रसित भारतीय इतिहासकारों और लेखकों ने चपाती वितरण को मात्र एक अंधविश्वास से प्रेरित घटना माना।

चपाती वितरण की प्रक्रिया को संचार के चार मॉडलों के रूप में देखा जा सकता है (मैक्वेल, 2010, पृ.75 -69)।

- **सूचना प्रसारण के रूप में चपाती का संचार :** चपाती वितरण का क्षेत्र और मार्ग एवं संग्राम का क्षेत्रीय विस्तार लगभग एक था। रातोंरात चपातियाँ मीलों तक पहुँचाई जातीं। इस वितरण का कालखंड संग्राम से ठीक पहले का था। वितरण के बारे में हर व्यक्ति जानता था।
- **व्यावहारिक रूप में चपाती का संचार, जिसके माध्यम से कई अर्थ व्यक्त हुए और समाज में एक चेतना फैली :** सूचना प्रसारण में व्यवधान न हो, शायद इसलिए इसे कोरा संदेश स्थापित करने का पूरा प्रयोजन हुआ। चपातियों में क्या संदेश छिपा था, इसका पता या तो अँग्रेजों को कभी चला ही नहीं या फिर अपनी अक्षमता छिपाने के लिए सारे प्रमाणों को मिटा दिया गया, यह बात आज तक एक रहस्य है। ये कुछ तथ्य और प्रश्न हैं, जो चपाती के अभिनव संचार माध्यम होने को स्थापित करते हैं। एक मत यह है कि चपाती वितरण संग्राम की पृष्ठभूमि तैयार करने का प्रयास था, अन्य मत है कि यह जन साधारण को किसी बड़े विप्लव के लिए तैयार करने का माध्यम था। इनके अलावा यह भी माना जाता है कि लोगों को संग्राम के मूल कारण से जोड़ने का यह सहज तरीका था।
- **विशेष प्रयोजन के सृजन और प्रचार के रूप में चपाती का संचार :** चपाती अँग्रेजों की हर दमनकारी नीतियों के विरुद्ध भारतवासियों के दबे आक्रोश का प्रतीक बनी। सैनिकों में पहले

से ही ब्रिटिश शासकों के प्रति रोष था और आम जनता निर्धनता, भुखमरी, महामारियों और लगान के भार से तड़प रही थी। ऐसे में चपाती ने आम जनता को संग्राम में जोड़ने का काम किया।

- **एक ज्ञप्ति के रूप में चपाती संचार, जिसके अर्थ जानने के लिए संकेतन और विसंकेतन की आवश्यकता होती है :** जिस चपाती का संदर्भ 1857 के संग्राम से जुड़ा, वह 'मोटे अनाज' की बनी बिस्कुट के आकर-प्रकार की थी। वह कालखंड, जब उपनिवेशी नीतियों के कारण भारत में अकाल और भुखमरी सर्वव्याप्त थे, तब रोटी ने एक रूपक की भूमिका निभाई, जिससे हर सामाजिक वर्ग, धर्म-जाति और क्षेत्र के लोग जुड़ सकते थे। इसे बनाने में कोई विशेष प्रयत्न नहीं करना होता, न ही इसके प्रचार-प्रसार में किसी भी तरह का कोई व्यवधान आता। सावरकर अपनी पुस्तक में लिखते हैं कि जेब में रोटी लेकर घूमना ही संदेश था कि कुछ बड़ा होने वाला है। कहने का तात्पर्य यह है कि आंदोलन में जागरूकता और सन्निकट संग्राम की सूचना का व्यापक संचार चपाती वितरण द्वारा संभव हुआ।

निष्कर्ष

आज तक इतिहास के अध्ययन में हर बार यह बात सामने आई कि भारत लगभग 200 वर्षों तक अँग्रेजों का गुलाम रहा और परतंत्रता की बेड़ियों को हम 1947 में तोड़ सके, परंतु इस बात को समझना भी आवश्यक है कि भारत में राजनीतिक और आर्थिक रूप से अँग्रेजों का नियंत्रण तो रहा, पर इस राष्ट्र की आत्मा ने कभी परतंत्रता को नहीं स्वीकारा। भारत के संतों, दार्शनिकों और ज्ञानियों का सर्वथा यह मत रहा है कि शरीर को बाँधा जा सकता है, पर आत्मा को नहीं। यह बात भारत और उपनिवेशी ताकतों के संदर्भ में भी खरी उतरती है। यूरोपीय शक्तियों को हर ओर से चुनौतियाँ मिलती रहीं। ऐसा एक भी दशक नहीं रहा, जबकि विभिन्न यूरोपीय शक्तियों को संगठित और सशक्त प्रतिरोध का सामना न करना पड़ा हो। ऐतिहासिक साक्ष्य इस बात को प्रमाणित करते हैं कि भारत के वीरों ने हर दिशा और दशक में विदेशी ताकतों से लोहा लिया और अत्याचारी औपनिवेशिक शासन के दाँत खट्टे किए। यही कारण है कि स्वतंत्रता संग्राम निरंतर रूप से चलता रहा और अंततः राजनैतिक और प्रशासनिक रूप से अँग्रेजों को 1947 में भारतीय उपमहाद्वीप से निकाल बाहर करने की प्रक्रिया संपन्न हुई। चपाती वितरण की प्रक्रिया 1857 के संग्राम की एक बड़ी महत्त्वपूर्ण घटना रही। संग्राम में चपाती वितरण की भूमिका पर लोगों के भिन्न मत हैं जो एक निरंतर वाद-विमर्श के रूप में सामने आते हैं।

किसी भी साक्ष्य का अध्ययन करने पर निम्नलिखित प्रमाण मिलते हैं :

1. 1857 के संग्राम से पूर्व चपाती वितरण एक सुनियोजित तरीके से हुआ। लोक संचार माध्यम से यह सर्वथा अपेक्षित होता है कि सूचना का संचार व्यापक और सुनियोजित तरह से हो।
2. पूरे उत्तरी और मध्य भारत से इस वितरण की सूचना रिपोर्ट हुई।
3. वितरण की गति और संचालन का स्वरूप सुनियोजित था।
4. गाँव के सामान्य व्यक्ति से लेकर सिपाहियों तक हर कोई इस वितरण से अवगत था।
5. अँग्रेज अधिकारियों को इसकी सूचना जनवरी 1857 से पहले ही मिल गई थी, पर उनकी तरफ से कोई कार्यवाई नहीं हुई।

चपाती वितरण की दिशा, गति और गुप्तता निस्संदेह यह प्रमाणित करती है कि सूचना प्रसारण में इसकी महत्त्वपूर्ण भूमिका रही। अब सवाल यह उठता है कि यह सूचना थी क्या? ऐसा कोई भी साक्ष्य उपलब्ध नहीं है, जिससे यह पता चले कि वह सूचना आखिर थी क्या? ब्रिटिश अधिकारियों की रिपोर्टें ही चपाती वितरण को संदिग्ध बताती हैं। यह पूरा प्रकरण उनकी अक्षमता और अज्ञानता को प्रतिबिंबित करता है। चपाती द्वारा प्रसारित सूचनाओं को दबा या मिटा देना उपनिवेशी शासकों के हित में था, अन्यथा इस देशव्यापी संग्राम को मात्र सैन्य विद्रोह कहकर वे उपेक्षणीय साबित नहीं कर पाते। यदि चपाती वितरण द्वारा प्रसारित सूचनाओं का वे विस्तृत विवरण देते तो उन्हें 'मूर्ख, अंधविश्वासी' भारतीय लोगों की अति कुशल सूचना संचरण क्षमता को स्वीकारना पड़ता। यह बात दंभ और शक्ति से ओतप्रोत साम्राज्यवादी ताकतों की नैतिक हार होती। तो फिर यह बात क्यों न मानी जाए कि सूचना संचार के माध्यम के रूप में चपाती वितरण को न स्वीकारना अँग्रेजों की एक सोची-समझी गतावलोकी कपट विद्या रही, जिसे उपनिवेशी और दास मानसिकता से प्रभावित इतिहासकारों ने बार-बार दोहराया। विभिन्न इतिहासकारों का मानना है कि 1857 में साम्राज्यवादी शक्तियों के विरुद्ध राजाओं और शासक वर्ग ने ही हथियार उठाए, पर साक्ष्य और तथ्य इंगित करते हैं कि समाज के हर वर्ग ने दमनकारी औपनिवेशिक शासन के विरुद्ध आवाज उठाई। 1857 इस बात का प्रमाण है कि समस्त भारत ने एक संग्राम को मूर्त रूप दिया और ईस्ट इंडिया कंपनी के शासन को खत्म करने में सफल रहे। ऐसी स्थिति में चपाती वितरण एक बड़ा ही महत्त्वपूर्ण घटनाक्रम रहा, जिसमें भारत के हर वर्ग, हर जाति, हर धर्म के लोगों ने अपनी सहभागिता दी। जनता को एकत्रित और जाग्रत करने में चपाती वितरण ने एक अभिनव लोक संचार माध्यम के रूप में भूमिका निभाई।

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