



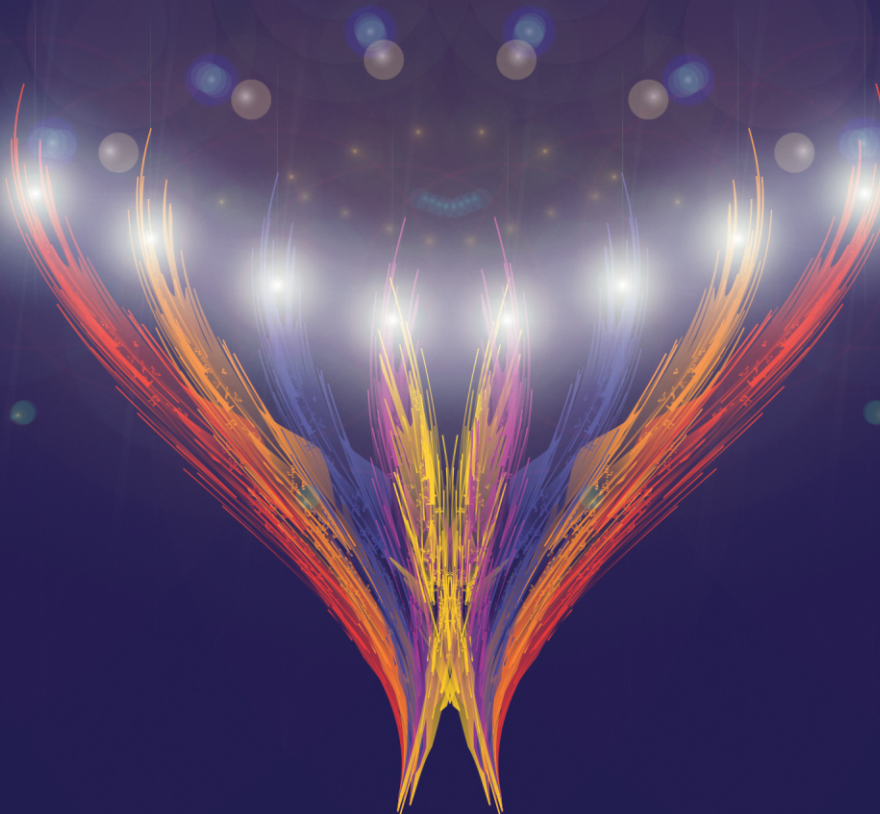
Kishinchand Chellaram College

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Foreword



K. C. College advances further into the research arena by publishing its second issue of Srujan - the Research Journal of K. C.

The theme of this issue is “Development: Emerging Issues and Contemporary Debates.” India is regarded as the next economic superpower and to achieve this rank, widespread development on

all fronts has to be accomplished.

However, development today has entered a confusing phase of flux and uncertainty wherein numerous people’s movements have brought to the fore the tensions inherent in the development discourse. This has forced a rethinking on development and has led to a quest for a participatory, inclusive and sustainable model of development. The contributors of this issue lend an insight into the various facets of this theme through their research papers.

I applaud the contributors for the sincere efforts taken by them and congratulate the Research committee for its exemplary work.

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Development has generally been identified with economic growth and the consequent growth in per capita income. Social, human and environmental aspects of economic development remained on the margins of the development discourse until the 1990's, when there was a perceptible shift in the focus of development planning from mere economic growth to development as the process of enhancing people's capabilities for improving their quality of life.

Today, the development scenario in India appears to be paradoxical. India has been one of the fastest growing economies of the world growing at a rate of 8 to 9 percent with a booming information technology sector, a growing consumer base and an ever expanding market. At the same time the socio cultural and political landscape is filled with resistance movements and growing resentment at the uneven, inequitable and lopsided process of development that has resulted in the marginalisation of the subaltern groups and environmental degradation. According to the recently released Human Development Report, India is among the 29 countries with the highest levels of hunger, stunted children and poorly fed women.

We are beginning to see the impact of climate change and increasing carbon emissions. The ceaseless pursuit of economic growth overriding social, human and ecological concerns has had disastrous consequences and has forced a rethink on alternative ways to conceptualise development. It is in the context of this development paradox that this issue of Srujan examines the theme "Development: Emerging Issues and Contemporary Debates". The papers in this volume engage with and explore diverse issues and contemporary debates within the development discourse and re-imagine development in 'newer' ways.

Dr. Hemlata Bagla

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In Transit: Travel Narratives in the 21st Century

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Abstract:

Hodoeporics derived from the Greek *hodos* which means 'a road' and *poreio*, which means 'to travel' takes us to the very core of what constitutes as Travel writing and reaffirms the narrative's motion through time and space. The exploration of binaries of the known and unknown, the self and the stranger become interwoven in the threads of a travel narrative. This paper examines how the concerns of travel writing or rather travel narratives have been transformed with the surge of the leisurely diversion of mass tourism in the 20th century. Has the contemporary liberalization of travel and mobility ruptured the conventional modes of travel writing while negotiating the continuum from colonial to cosmopolitan visions? Is the contemporary travel writer's interest in re-imagining of the world not for the unexplored expanses of terra firma but a journey into the vast uncharted complexities of the post modern soul? These questions are engaged in a critical reading of Pico Iyer's *The Global Soul*.

Whereas the tourist generally hurries back home at the end of a few weeks or months, the traveller, belonging no more to one place than to the next, moves slowly, over periods of years, from one part of the earth to another.

The Sheltering Sky, Paul Bowles

Travellers /explorers have made journeys through centuries to make inroads into cultures and terrains not their own. Travel accounts go back in time with early accounts traced back to ancient Egypt and Mesopotamia. These came to be prominent literary genres as well as invaluable sources of information for rulers who used them to understand the people and lands under their domain. Some of the significant works include accounts by Greek historian Herodotus and the Chinese envoy Zhang Qian, the vast compendia by Ptolemy and Pliny the Elder became templates for subsequent writers.

Historically travel writing participated in the international realm by disseminating the goals of Empire and therefore narratives of distant exotic locations were essential in justifying its rationale. Many of these colonial travel narratives have been examined by post-colonial scholars such as Edward Said who in his work *Orientalism* (New York, Vintage 1978) argued that travel writing of

famous authors such as Richard Burton and Gustave Flaubert was central in reinforcing colonial rule. Cultural and literary historian Paul Fussell announced the death of this genre by arguing that with the onslaught of mass tourism in the mid 20th century, the age of 'real' travel and consequently 'real' travel writing had ended.

Patrick Holland and Graham Huggan's work *Tourists with Typewriters* (1998) tried to correct the imbalance created by excessive focus on travel writing of the colonial period with very little critical analysis on contemporary travel writing. In fact their work was a powerful refutation of Fussell's view and revealed how travel writing had in fact flourished in the age of mass tourism. As Swick posits in an age of mass tourism (and YouTube), the travel writer's job has changed. It is not enough anymore simply to describe a landscape--we must root out its meanings. (2010)

In the twenty-first century, untouched and unexplored destinations grow harder to find, and solitary explorations are a thing of the vanishing past. For all the perilous journeys made across tropical rain forests, stormy seas or treacherous deserts by early travellers, the contemporary traveller has the ease of viewing the world with the comfort of a guided coach tour or perhaps GPS

assisted travel itinerary. According to Delbanco the action itself may be special and strange but the landscape has been long since mapped. (2004) The very novelty of reading stories retrieved from the “ends of the earth” has given way to staid look at a global village. The monopoly held by guidebooks like Baedeker and Guide Bleu in assisting the Grand Tour of a well heeled traveller in the mid-19th century have been replaced by whole travel sections in bookstores catering to every taste .

In the 21st century there is an increasing questioning of the Self vis-à-vis the countries being explored, which are no longer unknown or unfamiliar. In times when information is instantaneous thanks to blogs, social networking sites the travel narrative finds an expanded readership which is both interactive and global. Women travel writers have found an unprecedented shift in avenues for women travellers as well as a significant growth in readership if one were to analyse the popularity of websites like Journey Woman and Tango Diva.

Early travel writing has been the focus of scholarly inquiry in the past couple of decades especially by postcolonial and feminist scholars .Most of these projects have essentially tried to deconstruct the writer’s perceptions of ‘objective’ insights into alien cultures, societies and landscapes while in service of a colonial or patriarchal power. The study witnessed a more extensive development in the 1990s with growing interest in cultural diversity, the escalating speed of modes of travel and impact of globalization. By the end of the 20th century the unprecedented growth in travel literature and travel anthologies expanded the trajectories undertaken by travel writing scholarship. These included significantly the impact of gender in travel and travel writing and postcolonial perspectives on travel.

While the progress in travel theory has been celebrated in the recent times one of the significant questions to be engaged by the critic is whether attempts at writing more culturally sensitive narratives confirm travel genre’s discursive maturity? Travel lies in the passage between the

point of departure and the point of arrival .In a globalized world, authors of contemporary travel narratives are constantly negotiating spaces from where they speak and the places they encounter. In *The Global Politics of Contemporary Travel Writing* (2006), Debbie Lisle asserts that underneath the veneer of civility are the old tropes of colonial travel narratives that are now employed in more sophisticated, humorous and self-deprecating tone. Lisle looks critically at ways in which contemporary travel writing is addressing its colonial legacy by engaging or not engaging with wider intellectual and cultural debates about global politics. Her work primarily concerns itself with the colonial and cosmopolitan visions that are currently shaping the genre itself.

Carol E.Leon’s work *Movement and Belonging: Lines, Places, and Spaces of Travel* (2009) puts forth the idea that place/space and travel share a reciprocal relationship. Indeed the discourse of spatiality is a discourse of travel and travel lines create places and spaces which ultimately define the self .Leon believes that within the vital but fluctuating linkages between self and places, some sense of belonging can be procured. Her theoretical position derives from the fundamental idea that travel is the movement that is integral in lines of travel. When travel lines are nomadic they cause fissures in boundaries of representation.

One of the key issues in contemporary travel writing is to document one’s encounters with others without reproducing an image of the other that lends itself to stereotypes. A travel writer in his or her writings is embarking on a on a form of internal exile, seeking to encounter others on their terms. Pico Iyer ’s travel books *Video Night in Kathmandu, Falling off the Map, Sushi in Bombay, Jetlag in L.A., Tropical Classical, The Global Soul* and *Sun After Dark*, describe various locations but touch upon a common theme a man adrift yet purposive, taking "flights into the foreign". He is an Indian by birth with both parents having emigrated from India to England. He is British and American by education--Eton, Oxford and Harvard. He is American by profession, working for a media conglomerate and has established

himself as a travel writer, essayist and book reviewer.

With his book of essays on postmodern travel, *The Global Soul* (2000) Iyer transports himself and his readers into hypersaturated space that captures frenzy of the modern condition. "And what complicates the confusions of the Global Soul is that, as fast as we are moving around the world, the world is moving around us; it is not just the individual but the globe with which we're interacting that seems to be in constant flux." (Iyer, 23).

Therefore "jet lag, shell shock, paradigm shift" (ibid, 86) defines the experiences of not just a traveller of leisure but management consultants, computer executives, migrant labourers, international aid workers and tribal backpackers who increasingly inhabit the international travelscape .

According to Bethanne Kelly Patrick,"For Iyer, journeys aren't just about steps, miles or boundaries--they're also about internal shifts, levels and quests. That is why, even if he managed to traverse every corner of the globe, he would still have endless amounts of material to draw on." (20) While the seven essays that make up the book traverse through the urban sensorium of Los Angeles, Hongkong, Toronto, Atlanta, London Pico Iyer witnesses a world with a blurring or even dissolving of international and cultural borders is paradoxically accompanied by an increasing sense of fragmentation.

The difficult intersections of culture, being, and desire which drive the world's in-between peoples, places, and pasts contribute to the current anxieties of a borderless world. "He had come to America in search of a new life ,I inferred, and I was reminded ,sadly ,of how the unhappiest people I know these days are often the ones in motion ,encouraged to search for a utopia outside themselves ,as if the expulsion from Eden had been Eden's fault .Globalism made the world the playground of those with no one to play with." (Iyer, 244)

Despite the gleaming promise of a futuristic metropolis epitomised by Hongkong whose economy is boosted by the teeming populace of expatriate and displaced, the city state is transmuted into a transit lounge absolving the multinational traveller the "need to exist in real time or real place at all." (ibid: 113) While the stories of people that Iyer encounters are poignant, they resonate with the spirit of increasing number of people who inhabit the fuzzy spaces of transnational existence. Yet the book may appear dated as it was written before the 9/11 attacks, global terror networks, the anti-globalization movements, the wars in Afghanistan and Iraq and the impact of these events on global flows of migrants and international travel.

As a fin de siecle work, the book does provide important shift for a Global soul and traveller who is forced to confront a world where a large percentage of the world is still subject to great social inequality and completely alienated from benefits of a globalized society. Iyer has consciously embarked on challenging his cocooned consciousness as an American citizen and stepped aside from mere reportage to offer a meditation on the West's fear of the proverbial "Other." "Alienness," he writes, "inheres not in a place or object, but in our relation to it. Our fears – of course – are as private, as unrational as our dreams." (Foran:2011). While the physical novelty of travel gradually diminishes in a shrinking and mapped world *The Global Soul* is indeed a transit zone for writers like Iyer who have sought for new directions in the field of travel writing in the 21st century.

Reading List

1. Delbanco, Nicholas. "Anywhere out of this world: on why all writing is travel writing." *Harper's Magazine* Sept. 2004.
2. Holland, Patrick and Graham Huggan. *Tourists with Typewriters*. University of Michigan Press (1998)
3. Iyer, Pico. *The Global Soul. Jet Lag Shopping Malls, and the Search for Home*. Vintage Departures, Vintage Books, Random House Inc. New York .2001.

4. Leon ,Carol E. Movement and Belonging :Lines,Places ,and Spaces of Travel .Peter Lang Publishing (2009)
5. Lisle, Debbie .The Global Politics of Contemporary Travel Writing, Cambridge University Press (2006)
6. Patrick,Bethanne Kelly.Writing across boundaries.Writer,Sept 2004,Vol.117 Issue 9,p20-24.
7. Swick,Thomas. "Not a tourist: in the age of Google and You Tube, there's no such thing as terra incognita. But it's still possible to travel to unknown places--with a little imagination." *The Wilson Quarterly* 34.1 (2010).

Webliography

1. Foran, Charles. An Eternal Pilgrim: Travelling with Pico Iyer
2. <http://charlesforan.com/wordpress/writings-features-an-eternal-pilgrim-travelling-with-pico-iyer/>(2011)

Resisting and Negotiating Patriarchy: Exploring Strategies and Challenges among Middle Class College Going Girls in Mumbai

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Abstract:

This paper makes an attempt to engage with and explore the different ways in which middle class college going girls in Mumbai resist, subvert and negotiate the gendered terrain in their everyday lives especially in the context of rapid social transformations that are reconfiguring notions of feminism and women's rights among this population. This paper, while being based on the findings of an empirical study is also informed by my engagements with students both inside and outside the classroom as a teacher of gender studies and also in my capacity as the Convener of the Gender Issues Cell.

The paper is located within the broad rubric of resistance studies (Kalpagam, 2000; Rajan, 2000) that have looked at women's resistance and agency within patriarchal structures. Years of engaged deliberations with my students has brought me close to the intricate, subtle and nuanced ways in which they resist patriarchy in their everyday lives without necessarily engaging in a politics of transformation. This paper does not claim to be an exhaustive exposition of resistance among students in Mumbai but is an attempt to explore some aspects only with respect to a particular college and area.

The paper is organised into three sections. First, I shall situate the context, then very briefly touch upon the method, explicate the strategies of resistances and negotiations and finally a brief discussion.

Context

My college is located in South Mumbai a premium location in Mumbai. Our students come primarily from the middle classes and from different religious backgrounds with a substantial number coming from the religious minority groups like the Muslims, Catholics and Parsis. Barring a few exceptions most of them come from extremely patriarchal joint or nuclear households where either the father or some male member is the head of the household with complete decision making power.

Method

The respondents in this study comprised a group of forty students who were in their final year of graduation. Intensive focus group discussions were carried out after class hours over a period of one month with small groups consisting of five to six students. These discussions covered a range of issues from mobility, sexuality, marriage and religion to career choices and their identities. Since we had had a close interaction in the classroom where sharing of experiences was an important pedagogic tool, students reposed trust in me and shared their experiences. Some students shared something very private and intimate not in a group but only during one on one interviews.

Constraints, Resistance and Negotiations

The respondents experienced various constraints on mobility, sexuality, career choices, marriage and food, religious prescriptions so on and so forth. Of course the specific nature of constraint depended on class, family and community background. What I was specifically interested in, was to explore the strategies of resistances and negotiations that they used in this context of constraint. So far as mobility goes they faced restrictions on timings, purpose, place, dress, and companions. Pubs and discos are places which they frequent without their parents' knowledge. The most common excuse for circumventing this is to

cite visit to a friend's house or a sleepover at a friend's house in case one is attending late night parties. Smoking hookah and drinking wine are common but expensive leisure pursuits and are indulged in on the sly. Muslim girls pointed out that they do not smoke or drink as their religion does not permit.

Dress

Restrictions on dress varied according to family and community background and the composition of the neighbourhood. For some Bohri girls, jeans with long tops were allowed while for Sunnis it was just salwar kameez. For others the restrictions varied between being allowed tight fitting dresses, tee tops, shorts and sleeveless dresses to a complete ban on them. In the light of these constraints a friend's house or the college common room is often used to change into clothing of one's choice. There was greater policing in case of those students who came from homogenous neighbourhoods where people are less anonymous and more known to each other and come from a single community. Students coming from mixed neighbourhood had greater choice in matters concerning dress. There was greater surveillance not only with respect to dress but also with respect to their arrival and departure and who they are seen with. Thus neighbourhoods constrain choices and determine what women could wear and do. They have to produce notions of respectability through their clothing lest someone point fingers at their reputation.(Phadke, 2007).

Menstruation

Rules of segregation associated with menstruation are experienced as severely constraining. This is across the board for Parsis, Muslims and Jains. In the case of Jain students the restrictions were harsh and rigidly enforced. They could not sit in the common dining or living area, could not enter the kitchen, touch items of daily use like television for instance, could not open the tap to wash their hands, sleep on cotton mattresses and instead use a satin one and nor could other family people touch them. One of them described it as a form of untouchability. This is an area where consent was

more pronounced since it happens within a space over which they do not have much control.

Marriage

In case of Muslims, both Bohris and Sunnis, there is pressure to marry early even before they complete their graduation. Many are engaged while they are pursuing their graduation. One of the main reasons for early marriage is to control their sexuality. As one of them mentioned 'Our parents are paranoid about their daughters losing their virginity'. For others there was no such pressure. Those who had witnessed violent incidents or a strained relationship between their parents said they would not marry till they achieved financial autonomy so that they could walk out of violent marriages and not suffer like their mothers did for lack of support structures outside the home. However for some marriage is liberating, it enables them to subvert the normative regimes and opens up spaces. As one of them said 'I love wearing western clothes but my father would not allow that. The person I am engaged to has no qualms about me wearing western clothes and I am thrilled'.

Religion

Students attested to the constraining influence of religious patriarchy and resisted it vociferously. One Sunni Muslim said 'I do not pray five times a day. I do not read holy books. I do not wear a burka. My mother says I am not behaving like a good Muslim girl. But I don't care'. Others felt repulsed by the double standards. They believed that if one has attended the mishaq^[a] and has taken an oath to follow certain religious prescriptions then there should be complete compliance rather than partial adherence.

However quite a few students opined that they wear the 'riddha' everyday because they feel it is a sign of shame and modesty and security and identity. The other tabooed topic which some found reprehensible and invasive was female circumcision that happened very early in a girl's life often performed under painful and unhygienic conditions and leading to painful sexual intercourse after marriage. However many refused

to talk saying it happens too early for a girl to remember and in any case it is a religious prescription which must be honoured. Jain students recounted how the rituals associated with paryushan^[b] was repressive and how they found ways and means to circumvent it by fasting for a few days instead of the mandated 8 or 10 days or 30 days.

Discussion and Conclusion

One can locate certain trends and patterns in this negotiation. As one would have noticed the above is not a linear narrative of victimisation rather one can discern the use of multiple strategies of consent, resistance, negotiation to counter the hegemonic presence of multiple and overlapping patriarchies of class, community and gender. They have learnt to deal and manage with them but not transcend them. Some have been very vociferous and vocal and have aggressively articulated their stated positions rather than compromising. For others given the overarching patriarchal norms trying to alter male behaviour or the power structure was asking for social change in a big way and so they negotiate interpersonal relations in non-threatening ways within the existing gender paradigms.

They are unwilling to let go the securities and entitlements that affiliative ties offer them. Family kinship and community bonds may be experienced as oppressive but the fact that they provide the securities of identity and cultural self worth makes it that difficult to rupture them.

What we also see are personalised and individualised ways of contestation rather than a collective, 'expressing solidarity' kind of contestation. Thus they object only to their particular situation, not to the system in itself. Perhaps this has to do with the nature and the pace of social transformation.

Let me briefly map the crucial aspects of this change. India of late seventies and early eighties is very different from today's India where the pace of social transformation is mind boggling and intimidating. Technology (the world of cell

phones, I pads, I phones, social networking sites) has enveloped us completely and made us immune to critical thought and reflection and has stripped us of what Marcuse calls the critical dimension. Technology has also fuelled the rise of religious orthodoxy. As one the students said 'the younger generation (Muslims) is getting very orthodox, earlier during Moharam people had to go to the mosque to listen to sermons now it is beamed into their homes through the local cable.'

What complements this process is the frightening spectre of increasing consumerism and materialism. The desire for possessing and acquiring consumer durables is so overwhelming that it leaves little time for reflection and introspection on issues of equity and social justice (Kalpagam, 2000)

One needs to interrogate the role of the media as well. Both print and electronic media are aggressively constructing an essentialist image of woman, where wifehood and motherhood are idealised and made to appear extremely gratifying and self - fulfilling roles without which a woman is incomplete.

The increasing suspicion and distrust towards the Muslim in the wake of a series of bomb blasts in recent years has reinforced ascriptive identities. Wearing a veil, growing a beard and wearing a skull cap and other religious markers of identity which had receded into the background have resurfaced. As one of the students said 'I have never seen my father grow a beard but in the last five years he has started growing a beard'.

What implications does this individualised personalised resistance rather than an 'activist one have for feminist politics and for people like us in the academia. In this context to assume that they have a false class consciousness and have no concept of a rights based discourse would be problematic. They may not be as politicized as in previous generations but they are not entirely individualized and apolitical either. Many of these young women may be passive supporters rather

than agents of change but they are supporters nonetheless.

A feminist consciousness is taking shape. Students narrated how they had always challenged the boundaries of social convention but never realized that those were individual feminist acts of resistance. Others said even that when they do not challenge the masculinist discourse it has forced a rethinking on certain aspects. Quite a few have tried to convince their mothers who they described as very submissive and docile, to stand up for their rights, to have a space and identity of their own. A Bohri girl mentioned how she had rejected 29 marriage proposals before finalising on the 30th one because in her own words ‘ I wanted a man with liberal views not one who would sport a beard and expect me to wear salwar kameezes and a’ riddha’ 24 into seven’. Or even more a student’s resolve to spread awareness on female foeticide and infanticide in college among classmates and friends and in her neighbourhood because her father attempted to kill her when she was in her mother’s womb.

What gives me hope as a teacher are these oppositional discourses which may be marginal to the dominant formations but offer the possibility of challenge. For me and I am sure for many others, teaching a paper like gender and society is a political project where one is striving for praxis, seeking transformations and interventions in the lives of students. When I see that happening I feel vindicated and validated.

Notes

- a) Mishaq is a congregation where all bohris take an oath to observe certain principles like reading namaz five times a day, observing fast during ramzaan, going to the mosque during moharam, wearing a riddha etc.
- b) Paryushan is a Jain festival that falls once a year. The duration of Paryusana is for 8 or 10 days and comes at the time when the wandering monks take up temporary residence for four months of monsoon. Most of the Jains observe fast. The span of the fast could be

anything between a day and 30 days or even more.

References

1. Avishai, Orit. 'Doing Religion' In a Secular World : Women in Conservative Religions and the Question of Agency Gender & Society 2008 22:409
2. Aronson, Pamela. Feminists Or "Postfeminists"? : Young Women's Attitudes toward Feminism and Gender Relations. Gender & Society 2003 17:903
3. Crawley, Di Sara; Lewis, Jennifer, Mayberry, M. Introduction—Feminist Pedagogies in Action: Teaching beyond disciplines. Feminist Teacher, 2008, Volume 19(1)
4. Chong, H,Kelly. Negotiating Patriarchy : South Korean Evangelical Women and the Politics of Gender. Gender & Society 2006 20:
5. Jowett, Madeline and Toole, Gill. Focusing researchers’ minds: contrasting experiences of using focus group sin feminist qualitative research. Qualitative Research 2006 Vol 6(4).
6. Kalpagam, U. Perspectives for a Grassroots Feminist Theory. Economic and Political Weekly,2002 Vol 37(47)
7. Kalpagam,U. Life Experiences, Resistance and Feminist Consciousness. Indian Journal of Gender Studies 2000 7:167
8. Rajan, Rajeswari Sunder. Introduction: Feminism and the Politics of Resistance. Indian Journal of Gender Studies 2000 7:153
9. Smart,Carol. Shifting Horizons: Reflections on Feminist Methods. Feminist methos, Vol 10(3) 2009
10. Wieringa, Saskia. (1997). Introduction: Subversive Women and their Movements. In Saskia Wieringa’s Subversive Women: Women’s movements in Africa, Asia, Latin America and the Carribean. New Delhi: Kali For Women

Psychological Consequences of Development Induced Displacement

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Abstract:

“Why didn’t they just poison us? then we wouldn’t have to live in this shit hole & the government could have survived alone with its precious dam all by itself”—Rambai whose village was submerged on account of the Bargi Dam. This sentence clearly brings out the psychological & emotional state of people who are displaced due to development. Thus this paper investigates the possible psychological consequences of displacement with regards to the Sardar Sarovar Dam which has displaced nearly fifty million families.

INTRODUCTION

“If you are to suffer, you should suffer in the interest of the country”—Jawaharlal Nehru speaking to villagers who were to be displaced by the Hirakud Dam, 1948. These words indicate how displacement always comes with its share of suffering even though the government makes promises to give facilities to the people displaced by development. A case in point is the Sardar Sarovar Dam which has displaced an estimated 50 million people who live in abject poverty and neglect.

Historical Overview

The Narmada River is India’s fifth longest river running through the states of Madhya Pradesh, Maharashtra & Gujarat. It is proposed to build major & minor dams on it and its tributaries with the Sardar Sarovar Dam being the second largest project in the Narmada in terms of both total area submerged and number of people displaced. (Baviskar, 1995, 199)

Justification for the Project

The Sardar Sarovar Dam was projected to be “in the national interest” benefiting many people while displacing very few as it would provide drinking water to 40 million people, irrigate areas in Rajasthan, Gujarat, generate hydroelectric power thereby emphasizing everything regarded as development but downplaying the lives of millions who were displaced due to the construction of the dam and who still face the burdens. This is typical

of the pattern of environmental displacement in that the particular group of persons deemed “in the way” of national development are often the most vulnerable members of society. (Bodley 1990, 137; ICIHI 987, 53; Penz, 1993)

The Displaced Population

The displaced people fit in El –Hinnawis definition of an environmental refugee since they “have been forced to leave their traditional habitat temporarily or permanently, because of a marked environmental disruption i.e. the construction of the dam” that jeopardized their existence and seriously affected the quality of their life in several ways that are discussed below. (El Hinnawi, 1985, 4)

Economic Livelihood

The dam affected peoples economic security in some very fundamental ways. Many of the people to be displaced were tribal “encroachers” with no formal title deeds so were regarded as “oustees” & only people with title deeds were allotted land. People who were land owners became landless and daily wage labourers.

Culture

Since people have to move away & live in other areas it will affect their family and social ties, language can also be a major barrier, they will move from isolation & independence to dependence on public institutions & services to protect against disastrous consequences of the

move. Also the caste system and a general lack of social ties has meant that for those resettled here is almost always little in the way of social bonding with other established communities in the area leading to social isolation. In all cases where people have resettled they have expressed a feeling of loss over leaving their home, they also feel a lack of privacy.

Health

The physical and psychological health of people who have lost their homes, lands, neighbours etc is greatly affected. The psychological factors are—

Stress

The people face intense stress due to uncertainty about their homes, security, and economic stability.

Lack of social support

People are settled at different places therefore have to live with total strangers thus their old traditional ties are shattered and they don't know whom to turn to in face of difficulties aggravating their stress.

Frustration

People have to make endless rounds to demand their dues like land, compensation money etc which is energy sapping and emotionally draining specially for uneducated population.

Isolation

Since people have to move away from their home areas and move to the outskirts of other villages where they are treated as outsiders they face isolation which can lead to stress and anxiety.

Aggression

Since the people are frustrated and oppressed it can lead to aggressive tendencies among the displaced population.

Suicidal tendencies

The hardships faced by the displaced population can lead to suicidal tendencies as they seem to lead a life of hopelessness for both themselves and their families.

Disturbances in sleeping patterns

Since people have witnessed the submergence of their homes and lands and places of worship thus experience nightmares and insomnia.

FINDINGS

Changes in the garb of development exploit large sections of people specially the poor and illiterate snatching their homes, lands and livelihood with false hopes for a positive future though actually nobody seems to be concerned about them. Thus the people who have actually sacrificed their lives for the development of the country are the most neglected hence the need of the hour is a follow up study to see the long term impact of displacement specially the psychological consequences as they are the most harmful in comparison to other factors.

RECOMMENDATIONS

Development is essential and may involve the displacement of large sections of population. If this is handled in a well planned fashion, future development plans will be established and further communities will be more willing to relocate if development so necessitates.

Since one of the main issues is the psychological impact on the displaced, displacement plans should focus on protecting their psychological health. For this, the first issue which needs to be tackled is the stress faced by the displaced population due to uncertainties regarding their future. Therefore a committee of well trained and dedicated people should be formed that would act as a mediator between the people and the government, provide a platform for people to air their grievances, be well versed in the local language and help people in the process of documentation which tends to be very complicated. The committee should also be present to answer any queries which the population to be displaced has, so that they have a feeling of support which will go a long way in reducing their stress.

The displaced population also faces problems because their age old ties and social equations are disrupted. Therefore it is essential that people are

relocated to areas which are replicas of their old villages so that their social life and support system is not affected.

Economic uncertainties also lead to psychological problems like anxiety and tension. This may aggravate into suicidal tendencies. Therefore people need to be trained in other occupations. Cottage industries may be setup where the displaced population can be provided with alternate employment.

The government can introduce some benefit schemes like government jobs, subsidised products etc for people who willingly give up their land for development and this can motivate others.

NGOs can be involved in the entire process to provide additional aid to the displaced population specially to deal with problems regarding women and children.

In addition, if the population is provided alternative accommodation and is settled before the development plans actually begin, the transition will be smooth and may achieve the goals of development.

References

1. Baviskar, Amita (1995), *In the belly of the river: Tribal conflicts over development in the Narmada Valley*. Delhi Oxford University Press.
2. Bodley, John H, (1990) *Victims of progress: Mountain View*. Mayfield Publishing Co.
3. El-Hinnawi, E (1985) *Environmental refugees Nairobi: United Nations Environmental Programme*.
4. Penz, Peter (1993) *Colonisation of tribal lands in Bangladesh and Indonesia: State Rationales Rights to Land and Environmental Justice*. In *Asia's environmental crisis* edited by Michael C Howard Colorado West View Press.
5. Independent Commission on International Humanitarian issues (1987) *Indigenous People: A Global Quest for Justice*. London Zed Books.

Economics of Health

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Abstract:

This article is an attempt to analyze the concept of health, need for health care and highlight the distinctive economic characteristics of health. It also provides an insight about the relationship between health care and economic development. Besides it tries to analyze the situation of health service delivery in India. Although health is widely understood to be both a central goal and an important outcome of development, the importance of investing in health to promote economic development and poverty reduction has been much less appreciated. Indeed, without a concerted effort, the world's commitments to improving the lives of the poor embodied in the Millennium Development Goals (MDGs) cannot be met. Hence, India has to go a long way to meet the health requirements of its population.

1. Introduction:

Health is a multifaceted concept. Conventionally, the word health is derived from the old English word "hall" meaning hale, whole, healed, sound in mind and limb [Last 1987].

1.1 Defining Health:

The narrow definition of health posts it as the absence of disease. The broad definition of health, however does not merely stress on the absence of disease but the fulfillment of a whole range of personal, physiological, mental, social and even moral goals.

There are two main ways of defining health, the positive approach where health is viewed as a capacity or an asset to be possessed, and the negative approach which emphasizes the absence of specific illness, diseases or disorders [Aggleton 1990].

a. The Positive Concept of Health

The WHO has defined health as "A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." [WHO 1946]. This definition highlighting health in a positive sense has been criticized for being utopian, though it is perhaps more appropriately viewed as an idea towards

which health care and other social actions may be oriented [Twaddle 1974].

According to the new definition of WHO [cited in Fairbanks and Wiese 1998], health is stated to be "the ability to identify and to realize aspirations, to satisfy needs and to change or cope with the environment. It is a resource for everyday life, not the objective of living. Health is a positive concept emphasizing social and personal resources, as well as physical capabilities" [WHO 1986].

b. The Negative Concept of Health

In terms of the negative concept of health, an individual is regarded as being healthy when not suffering from a particular illness or disease. The terms 'illness' and 'disease', although often used interchangeably, can be distinguished. Disease relates to a biological malfunction, diagnosed by doctors, while illness relates to the personal experience of disease and its wider social implications. [Kleinman 1978].

The Negative Concept of Health is closely associated with orthodox medicine, which is focused mainly on disease. It is often argued that the doctors are not particularly interested in health in a positive sense and that the negative approach to health has tended to predominate. [Gould 1987].

1.2 The Need for Health Care:

The notion of need for health care services can be related to a need for health per se since it seems not unrealistic to suppose that health services are best viewed as instrumental in the promotion of better health. A need for medical care exists well and individual has an illness or disability for which there is an effective and acceptable treatment or cure [Matthew 1971]. 'Needs' are those demands which in the opinion of the doctor require medical attention i.e. they are an expert view of our health state. [Cooper 1975].

1.3 Distinctive Economic Characteristics of Health:

The major distinctive economic characteristics of health and medical services are listed below.

a. Uneven and Unpredictable Incidence of Illness

Apart from periodic physical examinations and immunization procedures that can be scheduled, requirements for health and medical services depend on the incidence of illness and injury. It is possible to predict rates of illness for a population on the basis of past experience. For an individual, illness is not predictable. Although he can try to save money in order to defray the costs of illness, he cannot be sure that he will accumulate a sufficient amount in time. Moreover, illness entails also the risk of impairment or loss of earning ability.

An obvious implication of the uncertain incidence of illness for an individual and predictable experience for the group is the desirability of pooling payments to meet the contingency of illness in the group.

b. External Effect

By definition, external effects in economics involve good and bad results for others that flow from one's own behavior.

In case of a communicable disease, provision of a preventive or curative service to an individual yields a benefit beyond the prevention or cure of illness in that individual. When a chain of infection

is broken, the effect achieved is manifold that for the person who received the treatment. Moreover, when a sizable proportion of a population has achieved immunity to a disease, the risk of infection for all others is reduced. In such instances, the economist states, the private marginal benefit from expenditure is less than the social marginal benefit. If so, consumer demand expressed through the market is too low.

c. Health and Medical Care as a Need

A person's need for health and medical care is generally taken as the basis of his right to receive it, regardless of ability to pay. The medical profession has always acknowledged an obligation to meet this need or an essential part of it. As a consequence, it provides free care to the poor and applies a sliding scale of fees (varying charges in relation to ability to pay) to the population at large. Hospital care, too, is provided at full pay, at part pay, or free, depending on the patient's means.

Owing to its increased effectiveness because of scientific advances, health and medical care is now proposed as the fourth human necessity, ranking after food, clothing and shelter. Such a necessity is deemed to have an absolute priority among society's goals.

d. Lack of Knowledge

Another characteristic of health and medical services is the consumer's inability to evaluate them. He cannot judge quality even after he has received the services. The consumer's ignorance and helplessness place a heavy responsibility on the integrity and the competence of the physician. This is recognized through the Hippocratic Oath administered to physicians at graduation from medical school.

e. Mixture of Consumption and Investment Elements

For the most part health and medical services are viewed as consumption items. Sometimes seen as necessities, they are also elements of rising standard of living.

Failure to render medical care to a gainfully occupied member of the labor force who needs it may result in disability and loss of output. Hence, a program aimed at preventing illness and disability among productive workers is obviously more of an investment in the nation's output than one that extends needed medical services to aged persons who are retired from the labor force.

f. Large Component of Personal Service

Most health and medical services are personal services or embody a large component of personal service. This fact has important implications for an economy that grows mainly through gains in productivity, rather than through expansion of the labor force. Thus, hospitals, which compete with other industries for some classes of employees, have not been able to offset the same proportion of salary increases with productivity gains. As a result, the costs and prices of hospital care rise faster than the costs and prices of most other goods and services.

g. Nonprofit Motive

For a large sector of the health and medical care industry the profit motive is not relevant as an explanation of behavior. Voluntary (non-profit) organizations under religious, ethnic or community auspices play a major part in rendering hospital care. The voluntary character of the hospital has created other problems. Historically, the hospital's labor force has received low wages, and hospital organizations have striven for - and obtained - exemption from labor relations laws and from coverage under social insurance legislation. Furthermore, in the absence of the profit motive, the criteria for efficient operation are not obvious.

h. Medical Service and Education as Joint Products

Medical service is frequently produced jointly with medical education and sometimes also with medical research. Most authorities believe that by conducting a good educational program a hospital enhances the quality of care rendered to its patients, since a teaching atmosphere and the presence of student's foster curiosity and challenge practitioners to achieve their best performance.

1.4 Health and Economic Development

For an individual, health has a double function. On the one hand, perfect health represents value of its own, a target that needs to be reached as closely as possible. On the other hand, there are other aims in life as well e.g. good health gives good income in labor market [Zweifel and Breyer 1997]. World Development Report, 1993 explained good health as a crucial part of well-being. It further asserted that spending on health can also be justified on purely economic grounds. Improved health contributes to economic growth in four ways;

a. Gains in Worker Productivity

The most obvious sources of gain from healthier workers are savings of workdays, increased productivity, greater better-paying job opportunities, and longer working lives. A study on lepers in urban TamilNadu estimated that the elimination of deformity with them would enhance the expected annual earnings of those with job by more than three times. [World Bank 1993].

b. Improved Utilization of Natural Resources

Some health investments raise the productivity of land and lead to improved utilization of the natural resources by enhancing the quality of worker's health.

c. Benefits to the Next Generation through Education

Poor health and nutrition reduces the benefits of schooling primarily in three areas: enrollment, ability to learn, and participation by girls. Children who enjoy better health and nutrition during early childhood are better prepared for school and more likely to enroll. A study in Nepal has found that the probability of attending school is only 5 per cent for nutritionally stunted children as compared to 27 per cent for those at the norm [World Bank 1993].

d. Reduced Costs of Medical Care

The spending that reduces the incidence of disease can result in big savings in treatment costs. For some diseases, the expenditure pays for itself even when all the indirect benefits - such as higher labor productivity and reduced pain and suffering - are ignored. Polio is one such example.

1.5 Health Service Delivery in India

Though data on public health care facilities in India are available, data about their uses are not available in a systemic manner. However in recent years, national surveys, such as the National Sample Survey Organization (NSSO) utilization surveys in 1987 and 1996, the National Council for Applied Economic Research (NCAER) surveys in 1990 and 1993, National Family Health Surveys (NFHS) in 1993 and the rapid household survey (RCH) in 1999 apart from small studies, have provided reasonably good estimates of utilization of public facilities and programmes [Duggal 2006]. [Table1]

India's social services were used relatively little by the poor and the under privileged socio-economic groups as witnessed from the above statistical figures. The health of the poor has improved but not as much for the population as a whole. This is because existing capacity and resources are inadequate, particularly for health [Murthy et al, 1990].

1.6 Conclusion

After independence in 1947, India decided to expand and improve the health services of the country as one of a comprehensive package program to raise the standard of living of the people.

In the Indian Constitution the fundamental right of protection to life and liberty [Article 21] include right to health, implying state obligation to protect citizens from medical negligence. The state is required to concentrate on the development of health infrastructure. But the centre has played a dominant role in all aspects of health, mainly because of its financial clout in centrally planned economy. There is no doubt that India has achieved a good deal during the last 60 years. However a lot needs to be done to make available, accessible and provide affordable health services to all.

Table1: Differentials in Health Status among Socio-Economic Groups

Indicator	Infant Mortality /1000	Under 5 Mortality /1000	% Children Under-weight
India	70	94.9	47
	Social Inequity		
Scheduled Tribes	84.2	126.6	55.9
Other Disadvantaged	76.0	103.1	47.3
Others	61.8	082.6	41.1

Source: GOI, 2002 b

References

1. Bengt, Jonson; Musgrove, Philip (2001): Government Financing of Health Care, CMH Working paper series, paper no WG3:3, WHO.
2. Dr. Anita N.H; Bhatia, Kavita (1993): People's Health in People's Hands, Bombay, F.R.C.H
3. Hunter, David J. (2007): Managing for Health, Routledge Health Management, Routledge Publication, Europe.
4. India Country Brief (2000): World Bank Group.
5. Mid- Term Appraisal of Xth Five year plan (2005): By Planning Commission, Govt. of India, Delhi.
6. Panchmukhi P.R. (2002): Economics of Health: An Introductory Review - A Reading material sponsored by Indian Economic Association [IEA] Trust Publications, New Delhi.
7. Patnaik, Ila (2006): Trickle-down economics is good for health, Cehat, Mumbai.
8. Raut, Himanshu Sekhar; Panda, Prashant Kumar (2007): Health Economics in India, New Century Publications, New Delhi.

Urban Financial Inclusion — Case study of SBI's Initiative in Surat, Gujarat

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Abstract:

Financial inclusion is generally associated with rural areas as the outreach of banks is limited. But even in urban areas there are groups of people who have been excluded from the normal banking channels for many reasons. One such group is the migrant workers. Surat in Gujarat is home to lakhs of migrant workers. State Bank of India, Surat Region has initiated a program of financial inclusion for the urban poor by adopting the Business Correspondent model in August 2010. I undertook a case study of this model to understand and evaluate the process. Empirical evidence shows that it has been successful in providing financial services to migrant workers and in mopping up their savings to the extent of Rs.82 crores in the last one year since its inception which is laudable. The study has also thrown up some interesting issues which need to be resolved if this initiative is to be taken forward. This paper looks at its benefits and the various areas of concern therein.

The importance of inclusive growth has been emphasized from time to time. Financial inclusion is indispensable to the well being and growth of any country, more so for a developing country like India. Hence the government as well as the RBI has been taking several steps in the recent past to make financial services accessible to all. The RBI in its annual policy statement of April 2005 recognized the problem of financial exclusion and has since initiated several policies aiming at promoting financial inclusion. NABARD too has experimented with many initiatives. Amongst the various initiatives, the Business Correspondent/Facilitator model is gaining momentum. With the objective of ensuring greater outreach of the banking sector and also to pursue policies of financial inclusion, banks have been allowed the use of NGOs, SHGs, MFIs and other Civil Society Organizations as intermediaries in providing financial and banking services through the use of BC/BF Models. (R.B.I Circular 2006)

Financial inclusion has always been associated with rural areas because the outreach of banks in such areas is limited. But even in urban areas, there are groups of people who have been excluded from the normal banking channels for many reasons. One such group is the migrant workers who leave their homes to eke out a living in commercial

centers. Surat in Gujarat is one such place which attracts migrant workers because of the employment opportunities it offers.. Surat, has earned the distinction as the fastest growing city and as the city with the highest per capita income in India. Known as the Diamond Capital of India, Surat is fast developing as a commercial centre too. Hence it is taking great strides in creating a massive infrastructure which is conducive to rapid expansion and growth. There is immense scope for employment in dockyards, textile industries, diamond cutting and manufacturing industries. Hence workers from U.P, Bihar, West Bengal and Rajasthan flock for employment to this city. The migrant workers form 16% of the 50 lakh total population of Surat. Regular remittances have to be made by these workers to their families in their hometowns.

State Bank of India (S.B.I), Surat Region has initiated a program of financial inclusion for the urban poor by adopting the Business Correspondent model (BC model) in August 2010. I undertook a study of the working of the model to understand and evaluate the process.

Methodology of study

Visits to half a dozen CSPs and interaction with the CSP service provider, clients and also the BC.

My study unearthed the following observations.

SBI Surat, felt an imminent need for a new initiative due to the following reasons. Migrant workers needed to remit money at regular intervals to their families in the villages. SBI has branches in every nook and corner and hence the workers chose to remit money through the bank. This led to serpentine queues in and outside the branch which hampered regular work and caused congestion. At times tempers flared leading to an unpleasant atmosphere. New customers were wary of entering the branch and existing ones could not be attended to properly leading to complaints and irritation. Most importantly basic financial services could not be provided to the deserving migrant workers who were threatened of being excluded financially.

The workers too had their share of problems. They had to waste a whole day standing in lines thereby losing a day's earnings and at times had to take the risk of keeping cash which was unsafe. The fact that they were drawing weekly or fortnightly wages necessitated frequent visits to the bank. In order to circumvent their problems they fell prey to unorganized unscrupulous elements that charged Rs 100 to Rs 200 for every Rs 1000 and promised delivery of funds at the doorsteps of recipients in villages.

Various solutions such as opening exclusive counters from 8 am in selected branches, offering concession to Happy Hour customers, etc were tried by the bank but the problem continued unabated. Introduction of Mobile Bank van was thought of but could not be implemented in time. After prolonged discussions the bank decided to introduce a Remittance Corridor by Using Customer Service Points (CSPs) under Business Correspondent (BC) Model to address the issue.

Zero Mass Foundation (ZMF), a BC with an all India presence was chosen. In fact, ZMF operates only on behalf of SBI in Gujarat though it operates in 22 other states for various banks. The service provider for ZMF is A Little World (ALW) which has its headquarters in Mumbai. The bank identified branches which had the maximum non-

home transactions and Customer service Points (CSPs) were set up near the bank branches. The procedure was explained by the BC to all the bank employees. Pamphlets in Hindi were distributed to the migrant workers in their place of work and residence as well. Branch managers and the Regional Manager visited the areas and advised and appraised the migrant workers of this initiative. Road shows led to speedy enrolment. This has picked up momentum and is blazing ahead.

Visits to the CSPs revealed the efficiency and efficacy of the model. A hand held device is used to aid transactions. Basically two types of accounts are opened by the CSPs. One is the Tiny Accounts which are the "No Frills Accounts". Remittances can be made from this account and money can also be saved in it. The cost of effecting remittances is also less when compared to other accounts. The other is the "Tatkal" scheme which has been introduced 8 months back. This is only for making remittances. Remittances can be made on payment of slab based fees which is shared by the bank, BC and service provider. SBI Tiny cards are given at the time of opening these accounts. The tatkal account is very popular so much so that no frill account transactions are minimum in number. Remittances are made in less than a minute and receipts generated by the hand-held device are given. New accounts are opened and registered with minimum KYC formalities. This has helped the workers because they save time and effort. They also save the heavy remittance charges of Rs 100 to 200 per thousand. Those with no frill accounts also got into the habit of saving small sums of money. Above all, it brought about technology aided financial inclusion.

The bank also gained by decongestion of branches and could offer better customer service. It also discovered a huge potential for cross selling of other products like insurance thereby taking financial inclusion beyond opening accounts and making remittances. A huge customer base was also created through tiny accounts. Urban financial inclusion has been made possible through this initiative.

Challenges

Today Surat has 44 CSPs which have enabled transactions worth Rs.189.3 crores from August 2010 to October 2011. The Tatkal scheme has mobilized deposits to the extent of Rs.94.7 crores and available savings in the various saving accounts is to the extent of Rs.80.24 crores. This model is being replicated in several areas as a recent RBI notification requires that banks work out a viable model for financial inclusion in every village with more than 2000 people.

While the above figures are encouraging, the study threw up certain areas which require careful monitoring and handling. There are **several areas of concern and are of the following nature.**

- a) The BC appoints a representative at each CSP. They are generally shop keepers well known in that area. Each representative brings in a certain amount of working capital ranging from 2 lakhs to 10 lakhs. This working capital deposited with the respective bank branches acts as the ceiling for their per day operations. For example, if one CSP operator brings in a capital of Rs 3 lakhs, he can carry on transactions only up to that amount. On exhausting that amount he has to make a fresh deposit of an equivalent amount in the branch and then carry on the transactions. This necessitates frequent visits to the branch causing delay. To overcome this cumbersome process, **higher levels of working capital** can be brought by CSP operators. However this may deter more people from acting as CSP operators in the first place. Moreover it could give room for mismanagement and also attract thefts.
- b) Though this portal is to be **opened for 24 hours**, BCs keep them open only for 12 hours and this causes congestion in CSPs in the morning hours. This problem is compounded when servers break down for short periods of time in between and this is not infrequent. This needs looking into.
- c) The **charges for transactions** are nearly Rs.100 per Rs 5000 which is four times what it would cost for remittances under no frill accounts. Despite lower cost of remittance under no frill account schemes, the workers preferred to use the Tatkal scheme. When I spoke to some workers waiting in line, they least seemed to worry about the higher charges because this ensured safe and speedy transactions. Their families in villages were able to receive immediate payment and that was all that mattered. They also felt the cost was less when compared to what unscrupulous intermediaries were charging.
- d) Possibilities of **fraud** lurk in every corner. The CSP operator is supposed to maintain a register of transactions and also give a machine generated receipt slip as proof of remittance done. However due to the illiteracy and lack of awareness of the customers, they were given hand written receipts and remittances were not effected immediately. Sometimes the customer came complaining of non receipt of funds at the other end and only then the remittance was effected. Sometimes servers break down and the transaction cannot be put through immediately. So the operator takes the money, gives a hand written receipt and makes the remittance later. But the customer due to his ignorance does not comprehend that the money has not been remitted. This requires a close watch as it can result in frauds and loss of reputation to the bank as a consequence.
- e) RBI has imposed a **ceiling on transactions** at Rs. 10,000 per day for each customer in order to prevent money laundering. Though this is a necessary ceiling, it is also an irritant to genuine customers. RBI may have to evolve some other method to check money laundering. May be it can instruct banks to inspect accounts with frequent and doubtful transactions.
- f) The BC model which was adopted to reduce decongestion in branches has resulted in **crowding in CSPs**. To ease this, more than

one hand held device could be installed in the same CSP. But BCs are not in favour of it and hence the solution is to open more CSPs.

- g) The need of the hour is a **full fledged monitoring mechanism** to inspect and monitor the activities of the CSP. For this banks would require more personnel and also more training for the inspection unit. In fact banks have to inspect these CSPs more rigorously than their own branches to avoid a loss of reputation.
- h) The **customers** have to be **educated** about the schemes in greater detail. On talking to them I found that they were not aware that they could save in their no frill accounts. They have to be well informed about the options open to them. For this, it is necessary to have posters in the CSPs showing pictorially as well in addition to a regular write up about the facilities available to them.
- i) The large customer base offers the bank **an opportunity to market the bank's other products** like insurance and mutual funds which has not been done so far.

The above are some of the concerns that require attention and care. Like in all new schemes, this will also evolve as a process. The bank however has to have in place a constant monitoring mechanism to make this initiative a greater success. The bank feels that as NREGA picks up, the flux of migrant workers to Surat may reduce as these workers may employment in their villages itself. Till then this remittance portal will continue to serve the needs of migrant workers.. The feather in the cap has been mobilization of Rs. 80 crores as savings. This has been a leap in the pursuit of urban financial inclusion.

References

1. The Microfinance Review—July-December 2009, Volume 1, Number 1. Bankers Institute of Rural development, Lucknow.
2. Readings in Financial Inclusion – Published by Indian Institute of Bankers, Mumbai

Biomimicry

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Abstract:

Biomimicry looks to nature and natural systems for inspiration. Biomimetics is the transfer of ideas from biology to technology. Scientists are keenly observing seeds, plants, diatoms, shells, birds, animals etc. and innovating. New materials are fabricated for buildings, paints, vehicles and packaging. New inventions like velcro, geckotapes, canes for the blind, bullet proof materials and even surveillance planes are all inspired by nature. Thus we admit with humility that nature's designs have a benefit of millions of years of testing unlike man made products.

Deforestation, Development, urban-ization and industrialisation have led to most of the ecological imbalances, so do we choose to remain undeveloped to conserve nature? Do we have to choose between development and ecological preservation? Can we not produce infrastructural facilities or objects of day to day use such that we apply principles abstracted from natural systems to engineering and technical design and applications?

Biomimicry looks to nature and natural systems for inspiration. Nature's designs have the benefit of millions of years of real life testing unlike manmade products. It is essential to develop an awareness of the short falls in most of the designs made by humans. After understanding how nature designs, biologists, engineers and architects need to come together and take a biomimetic approach. Biomimetics is the transfer of ideas from biology to technology. It is of special interest to researchers in nanotechnology, robotics artificial intelligence, medical industry and the military.

Have you seen a lotus and wondered how it remains so sparkling clean? The flower and leaves have a rough and waxy surface which naturally repels dust and dirt. When water falls over a lotus leaf, it rolls over anything on the surface leaving a clean and healthy leaf. A paint with similar properties pushes away dust and dirt, diminishing the need to wash exteriors of a building. Sharkskin has overlapping scales called dermal denticles. These have grooves running down their length in alignment with water flow. Roughness discourages

parasitic growth of algae and barnacles. These principles are used in designing swimsuits and bottoms of ships[Image 1].

Termite dens may look other worldly. However in spite of swinging temperatures below 10⁰ C and above 45⁰ C during night and day, they maintain a comfortable temperature.

They achieve this by opening and closing a series of heating and cooling vents throughout the mound in the day. East Gate centre, the largest office and shopping complex at Harare, Zimbabwe uses 90% less energy than traditional buildings, for temperature regulation [1]. There is a large chimney and many ducts for ventilation. These draw the cool air at night to lower the temperature of the floor slabs and fresh air replaces stale warm air that rises up, exits through exhaust ports of each floor. Ultimately it is flushed out of the building through the chimney. [Image2]

Tumbleweeds have curved barbs which interlock with each other. These hook one branch with many others giving the plant a resilient flexibility and aggregate strength. Velcro fasteners are designed by mimicking these small hooks[Image3]. Gecko tapes are adhesive tapes which are used on the soles of Robots, for climbing walls. These are inspired by the mechanism used by a Gecko lizard to climb vertical surfaces and also remain upside down. Weak intermolecular attractive forces on the foot pads are super sticky at one moment and not at the next.

Wright brothers observed birds keenly in Japan while designing aeroplanes. The bullet train Shinkansen is the fastest train with a speed of 200 miles per hour. However whenever it would come out of a tunnel, it would produce an extremely loud bang because of change in air pressure. In nature, a kingfisher which dives from air into water with a splash is in a similar situation. Engineers redesigned the front of the bullet train based on the aerodynamic shape of a kingfisher's beak which allows it to dive into water with hardly a splash or a sound. Bats have inspired solar powered surveillance planes of USA government and also the "Ultra cane" which warns blind users of obstacles in their path using ultrasonic echoes[2].

A robotic arm is designed after an elephant trunk for flexible and pliable movements. Bird skulls inspire lighter and stronger building materials. Human teeth can withstand a lifetime of chomping of hard foods. They have a sophisticated structure

of micro cracks which heal over time. Engineers are trying to fabricate crash resistant self healing materials for aircrafts. Antlers too have inspired super tough, durable materials used for making car bumpers.

Thus biomimetics helps in bridging the dangerous chasm between environmentalists and technophiles. It is a new way of viewing and valuing nature and using it as a mentor and a driving force behind sustainable design.

References

1. Andrei P. Sommer and Ralf- Peter Franke (2003) :Nanoletters3(5),pp573-575
2. Janine M. Benyus (2002):'Biomimicry – Innovation inspired by Nature'. Harper Collins, USA.
3. www.nature.com



Image 1: A Shark and Shark skin swim-suit

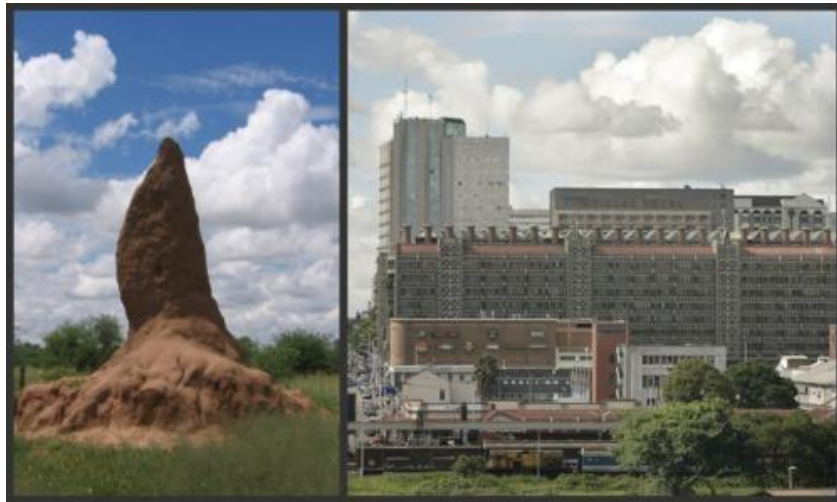


Image 2: Termite den and East gate Centre, Harare, Zimbabwe



Image 3: Barbs and Velcro

Source: www.nature.com

Health and Development: Interventions and experiments in health

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Abstract:

The fact of nature proves again and again 'Change is the only constant thing in the universe'. It is a matter of pride being part of the largest democracy in the world. But one always finds it difficult to judge if such democracy gives a common man more benefits or makes him more helpless. One can talk at length, about the rise, rise and fall of many important sectors of public life of India like education, agriculture and health. Independence was and will always remain a major landmark in the Indian history. The golden era of post independence brought dreams which seem to be within reach and which would make each Indian healthy, wealthy and wise.

Introduction

Health care in India is delivered at primary, secondary and tertiary levels. In addition there are subcenters for delivery of health services. [Sanjit 2008]. A sub-centre provides service to about five thousand people, or about three thousand in hilly, tribal and underdeveloped areas. They are typically staffed by one male and one female multi-purpose health worker, offering services such as immunization and family planning.

The primary level of care is typically provided at rural primary health centers, each of which serves about 30,000 people (20,000 in hilly, desert and difficult terrains) and is staffed by a medical officer and two health assistants, along with health workers and support staff. A primary centre's functions are typically basic medical care, maternal and child health and family planning, prevention and control of locally endemic diseases, implementation of national health programs, basic laboratory services, health education and referrals. The next service level, secondary health care, tackles more complex health related problems at district hospitals and community health centers, while the final, or tertiary, level involves the provision of higher and more specialized services, typically at specialized hospitals, medical college hospitals, and regional institutes and so on.

Many believe that the quality of care is directly proportional to distance from India's major cities. Beyond the public system lies a burgeoning private

health sector, which is useful only to those who can afford it. Some argue that it provides speedier service than in the Western world and it is not as far out of the reach of the middle classes as might be believed.

Interventions and Experiments

Interventions in Indian health sector have been tremendous. The health plans of government till 1970s were more concerned with improving health of poor and providing better sanitation facilities in rural areas. The middle and upper class were not as bothered about the health sector as they were least affected by health issues.

In 2005, India launched the National Rural Health Mission to provide accessible, affordable, and quality health care to its rural areas, particularly to poorer and more vulnerable sections of the population. A central goal of the mission is increasing public expenditure on health—from the current 1.1 percent of GDP to roughly 2–3 percent of GDP within the next five years—to expand public health services, improve infrastructure and staffing and reduce the burden of health spending on the country's poor. The mission aims to help bridge the wide gap in health care facilities in the different states, to sustain the health gains in the better-performing states and to address the chronic disease burden that will increasingly strain India's health care system. Target interventions also should address disease conditions that are major sources of infant and child mortality and infectious

diseases to better address the needs of those who are underserved by the current system. Universalizing a subset of specific interventions can be more effective than providing a large range of health interventions without regard to joint costs or shared use of inputs (Bobadilla et al. 1994).

Two interventions were explored:

Breastfeeding promotion taking place within the first year of life and **oral rehydration therapy (ORT)**, which can treat an entire cohort of children under five simultaneously. For breastfeeding promotion, cost-effectiveness ratios were calculated by considering the cost of treating all newborns in a single year and the benefits (DALYs and deaths averted) from those treatments that occur over the first five years of life. These benefits include avoided mortality that allows individuals to live to the full life expectancy for the region. In contrast, since a single year of ORT yields only contemporaneous benefits—because effectively treated individuals do not necessarily live to life expectancy, given that they are likely to be reinfected the next year—we calculated cost-effectiveness of a five-year intervention. Analysis of a five-year intervention enabled us to consider the case in which an entire cohort of zero- to four-year-olds avoids early childhood diarrhoeal mortality because of the intervention and receives the benefit of living to life expectancy. Breastfeeding helps reduce diarrhoea deaths by reducing the likelihood that an infant or young child ingests contaminated water. Two breastfeeding promotion strategies were considered; 1) maternity services-based breastfeeding promotion requires hospital policies and actions to encourage breastfeeding and discourage bottle feeding, and 2) community-based breastfeeding promotion involves mass media and community education alongside counseling and education provided by peers and community health workers [Ramanan 2007].

Tuberculosis

Tuberculosis (TB) is responsible for 5.6 percent of all deaths in India. Nearly 1.4 million cases are reported in India each year, with the majority, 57 percent, reported in the non-EAGA states (RNTCP

2006a). However, among the 525,000 TB deaths per year, 59 percent take place in the EAGA states. Over the past decade, the World Health Organization (WHO) has promoted DOTS, a multi-component strategy, as the primary treatment for TB. The DOTS strategy has five elements (Dye and Floyd 2006a): political commitment by national governments; diagnosis, primarily by sputum-smear microscopy; short-course chemotherapy using first-line drugs, with case management that includes direct observation of treatment; a regular drug supply; and systematic monitoring to evaluate the outcomes of every patient.

Additional public health spending must be appropriately targeted if it is to yield significant health benefits. Public spending can be more effective than private spending only if it undercuts the perverse incentive in the private sector to offer expensive, wastefully inappropriate treatments. [Ramanan 2007].

Discussion

In deciding how to use the additional resources to effectively improve health, the National Rural Health Mission should focus on interventions that generate maximum levels of health gain across the population, while improving the basic staffing and infrastructure of public health services needed to provide these interventions. Target interventions also should address disease conditions that are major sources of infant and childhood mortality and infectious disease burdens, to better address the needs of those who do not receive adequate health care by the current system.

Universalizing a subset of specific interventions can be more effective than providing a large range of health interventions without regard to joint costs or shared use of inputs [Bobadilla 1994]. Defining a package of basic interventions provided by the government simplifies planning of new investments in training and infrastructure, identifies a minimum set of necessary inputs, helps estimate financial requirements, and makes service availability and impact easier to measure and assess. Moreover, establishing a set package makes

clear to citizens and health providers alike exactly which services the government will and will not fund, reducing the potential for the rent-seeking that occurs when poor consumers are not aware of their entitlements.

India being the country with rich natural resources, intelligent and brave minds and with people ready to put in hard work, nothing is impossible for us. The only caution for ourselves is not to follow the west. In an urge to follow the same lifestyle as that of forward countries we have compromised with the quality of life. In an endless greed of easy money we have brought corruption, pollution, terror and an unhealthy life.

The present appears to be the right time to reassess the role of the government and private sector in the health sector in India. It need not, and perhaps cannot, contribute greatly to the growth in infrastructure from now on. However, it needs to take on the mantle of the guardian of standards in health care. It can do this only if it concentrates on providing top quality care at government institutions. The government must also continue to play a leadership role in the training of health personnel [Ramanan 2007]. By maintaining high standards in medical and other professional training, it can contribute greatly to quality in health care. Public-private partnership can bring back the confidence and faith of the country to fight any challenge. The growth of health facilities in Kerala offers many lessons in development. The active role of the state government has been a key factor in the expansion of health care facilities. The initial period of rapid growth in health facilities was dominated by the public sector, up to the 1980s. By the mid-1980s, because of fiscal and other problems, there was a slowdown in the growth of government health institutions. This

affected not only the growth in absolute number of beds, but probably the maintenance of quality as well. However, by this time, the private sector was poised for growth and it took the lead in the growth of health care facilities in Kerala [Raman 2000].

Conclusion

Health facilities in India are comparatively cheap. We Indians have conveniently learnt to overlook things on which we do not want to spend time. Things like unhygienic surrounding, polluted atmosphere, dirty, un-potable water affect our health directly. We simply cannot blame the government as we have the power to change. Right to good health is a basic human right. Within the societies or local areas we can be responsible for health of the residents. When we show the courage we get the power. It is time for a mass awakening on health issues in the country. Each one of us has to take charge of our health and 'be the change that you want to see'.

References

1. Sanjit, B. 2008. 'Growth generates health care challenges in booming India'. CMAJ. April 8; 178(8): 981-983.
2. Bobadilla, J.L., et al. 1994. 'Design, content and financing of an essential national package of health services'. Bulletin of the World Health Organization 72(4): 653-662.
3. Ramanan, L. et al., 2007. 'Cost-effectiveness of Disease Interventions in India'. December RFFDP0 7 – 53.
4. Raman, V.K. 2000. 'Historical analysis of the development of health care facilities in kerala state, india'. Health policy and planning; 15(1): 103-109.

Oral Hygiene Products: An in vitro testing

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Abstract:

Oral cavity shows the presence of wide variety of microorganisms, out of which some are pathogenic. Daily brushing represents temporary disturbance to the normal microbiota of the oral cavity. Variety of tooth pastes and mouth washes (synthetic or herbal) available commercially, delay the growth of bacteria which are most frequently present on or near tooth surfaces and responsible for bad breath or common oral diseases. In the present study, an effort is made to check the comparative effectiveness of some commercial products as well as natural plant products designed to maintain oral hygiene. Two bacterial species i.e. *Staphylococcus aureus* and *Streptococcus pyogenes* are isolated from the oral cavity and checked for sensitivity against various toothpastes and natural products. It was noted that herbal toothpaste are equally effective as that of synthetic products, however, their effectiveness varies with the brands. Higher concentrations of natural products are required as compared to fine products to inhibit the growth of oral bacterial species studied. *S. pyogenes* is more resistant to oral care products as compared to *S. aureus*.

Introduction

Teeth are subject to decay due to the action of micro-organisms thriving on various food particles. Within the oral cavity microorganisms can grow on various surfaces, including gums (gingiva) and teeth [Braude, 1980; Davis et al., 1981]. The availability of water and the nutrients including growth factors provides an environment favourable for the proliferation of microorganism [Pelczar et al., 1993]. Mechanical and biochemical factors limit the types of microorganism that can survive in it. Talking, chewing and swallowing dislodge microorganisms that are not able to adhere [Ingraham and Ingraham, 2002]. The human mouth is densely populated with more than 80 different species of microorganisms like *Actinomyces*, *Neisseria*, *Staphylococcus*, *Vibrio*, fungi such as yeast *Candida albicans*, protozoans such as species of *Entamoeba* and *Trichomonas*. [Talaro and Talaro, 2002; Wistreich and Lechtman, 1980]. After the complete removal of the microorganisms from the tooth surface by brushing, within minutes, population of *Streptococcus* species and others which colonize the tongue and saliva once again cover the teeth surface [Atlas, 1986]. Mouth streptococci include *S. salivaris*, *S. pyogenes*, *S. Mitis*, *S. aureus* and many other species [Ingraham

and Ingraham, 2002]. *Streptococcus* species normally constitute a high proportion of normal microbiota of the oral cavity. Various *Streptococcus* species produce a slimy layer and adherence factors allow them to stick onto tooth surfaces. The term normal flora implies those organisms (microbes) which are harmless if present in less number, for the most part they do not cause infections or diseases and are even beneficial [Pelczar et al. 1993].

Proper dental hygiene- brushing teeth, using mouthwash, flossing and chewing sugar free gum can dramatically reduce tooth decay [Jonathan et al., 2002]. Before invention of oral care products, people used to scrape their teeth with things like egg shells or burnt animals hooves, charcoal, salt etc. In 1914, there were toothpastes with fluoride which is still used today to maintain oral hygiene. Nowadays, the control in growth of bacteria is possible by various oral hygiene products viz. toothpastes, toothpowders, chewing sticks, mouth rinses etc. Toothpastes are most frequently used amongst the commercially available oral care products.

Various mouth rinses viz. Herbal Mouth and Gum Therapy mouth rinses are reported to have natural ingredients which has antimicrobial activity against *S. mutans*, and *S. sangius* and *Actionmyces viscous* [Kaim et al., 1998]. The antimicrobial activity of various plants as *Accacia nilotica*, *Mimusops elengi*, Neem etc., has been studied by Bhatt et al., [2003] against *Baccilus species* isolated from the mouth. Gultz et al., [1999] has tested the antimicrobial activity *in vivo* of some commercially available cavity disinfectants with the bacteria present in oral cavity, *S. mutans*, *S. salivaris* and *Actionmyces viscous*.

Very few reports are available on the effect of any of the natural, synthetic products on the growth of the microorganisms as part of normal oral flora. The aim of our present investigation is to compare the effectiveness of the various mouth cleansers on the growth of commonly occurring oral flora.

Materials and Methods

Samples were collected in duplicate from the various parts of the tooth surface from three subjects with the help of a previously sterilized tooth-pick and streaked on N-agar plates in triplicate. The plates were incubated at 37° C and observed after every 24 hour interval in terms of types and total number of bacterial colonies developed, till the number of the colonies stabilized. Two types of colonies, most frequently observed were further isolated by repeated streak plating on N-agar media. These isolated species are identified as *Streptococcus pyogenes* and *Staphylococcus aureus* by means of colony characters, Gram characters and Biochemical tests and used for further experiments. In order to determine optimum dilution, serial dilutions were prepared and spread on the surface of N-agar plates.

Various toothpastes and mouth rinses available commercially and used commonly (viz. Colgate, Pepsodent, Close up, Promise, Babool, Neem, Meswak, Smyle herbal, Colgate herbal, Dabur Red, Vicco, Plax, and AM PM Plus) were collected from local market. Different concentrations (0.1% to 5%) were prepared and incorporated in to N-agar medium.

Tender branches of three natural products viz. Clove [*Eugenia aromatica*], Babul [*Acacia nilotica*] and Neem [*Azadirachta indica*] were powdered and soaked overnight in Phosphate buffer (100 mM, pH 7.2). After centrifugation, the supernatants were separated; pellets re-extracted and treated as source of active compounds from natural products. These supernatants were added to N-agar medium in various concentrations (0.1% to 1%).

24 hour old bacterial isolated colonies were selected and diluted with phosphate buffer to obtain optimum dilution (i.e. 8000 times). 100 µl of the bacterial suspension was spread on the N-agar plates containing various concentrations of different products (Food poisoning method). The inoculated Petri plates were incubated at 37°C for 24 hours. A number of bacterial colonies developed on each plate (Control and experimental) was recorded manually. For each product and each concentration two replicates were prepared and number of colonies developed was tabulated as mean of the two replicates.

Number of the colonies developed on control plates (i.e. N-agar without addition of any oral care product) was treated as 100% growth and was compared with the treatments (i.e. when media was supplemented with various products). Percent inhibition in the growth of two different species with various toothpastes, mouth rinses and natural products was plotted against concentration of the same. Level of significance of difference in their efficacy was calculated using unpaired t-test and single factor analysis of variance using Microsoft Excel Program.

Results and Discussion

Samples collected from the tooth surface of various subjects showed growth of many bacterial species. Two frequently occurring species were selected and identified as *Streptococcus pyogenes* and *Staphylococcus aureus*. Optimum size and dilution for inoculation was 100 µl and 0.125×10^{-3} (i.e. 8000 times), respectively.

There are a number of oral care products available in the markets in the present age. It includes Chewing sticks, Tooth powders, Tooth pastes, Mouth Rinses, Chewing gums etc. In addition, all these products are available in synthetic and herbal formulation under a number of brands. A layman will always end up experimenting with various products to obtain proper oral hygiene.

To check the effectiveness of various oral care products against common organisms present on oral cavity various methods have been used [Holt et al. 1994]. The most common methods used in microbial assay are paper disk and agar ditch. Bhatt et al [2003] have concluded that Paper disk can hold only a few μ l of extract to be tested, where as in case of agar ditch method, active compounds may differ in the rate and time of diffusion in agar media. Hence, direct addition of the extract to the media is proved to be the best method. In the present study, to check efficacy of the given sample against growth of two separated bacterial species, the sample is directly added to the medium, known as food poisoning method.

Toothpastes are the most common type of oral hygiene tool. In the present study 12 different toothpastes were selected and tested for their effectiveness to inhibit growth of oral flora by food poisoning method. Average amount of the toothpaste on an average sized toothbrush taken by individuals, ranges from 1-3 grams and generally some part of it is spitted out directly without providing sufficient reaction time. With respect to these general observations, in the present study various toothpastes have been taken in 0.1 to 2% concentration.

Figure 1 represents percent inhibition in the growth of two selected bacterial species by various tooth pastes. Pepsodent showed some growth only at 0.1% concentration in both the species whereas Colgate fails to show any inhibition with low concentration. Close-up was more effective in suppressing the growth of both the bacterial species as compared to Promise (Fig 1a, d). Meswak was inhibitorier as compared to Vicco. *S. pyogenes* were more inhibited by Neem as

compared to Babul, where as *vice versa* is true for *S. aureus* (Fig. 1 b, e). Dabur Red, Smyle Herbal, Colagate Herbal and Himalaya were able to show complete inhibition even with 0.5% concentration (Fig. 1 c, e).

Analysis of variance (ANOVA: Single Factor) performed amongst various toothpastes showed significant difference ($P < 0.3$) in their activity against *S. pyogenes*. In contrast to this, growth of *S. aureus* was inhibited by most of the toothpastes, therefore, the difference in their activity is less significant ($P < 0.75$).

Thus, from all the toothpastes included in the present study, Dabur Red tooth paste is most effective in inhibiting the growth of two selected bacterial species, followed by Close up, Smyle Herbal and Colgate Herbal. *S. pyogenes* have more resistance for all the toothpastes as compared to *S. aureus* (Fig. 1). Herbal tooth pastes are equally effective as synthetic ones; however their efficiency varies with the brands.

Figure 2 (a and b) shows the percentage inhibition by two mouth rinses i.e. Colgate Total Plax and AM PM Plus, when added in various concentrations to the media. Plax and AM PM both showed complete inhibition of *S. pyogenes* at higher concentrations (i.e. 5% and 1%). However, with lower concentrations of Plax the organisms were able to form the colony (Fig. 2a). Plax and AM PM both have completely inhibited growth of *S. aureus* (Fig. 2b). To test the significance of difference between activities of two mouth rinses unpaired t-test (assuming equal variance) was performed. It showed clear and significant difference ($P < 0.09$) in the effectiveness of the two mouth rinses.

In the Middle East and Indian subcontinents as well as in different parts of the world, chewing sticks are used as oral hygiene tools. There are many plant species used as chewing sticks (Meswak). *Accacia nilotica* L. (Babul) earlier known as *Accacia aerabica* is used in conditions of bleeding gums, mouth ulcers and urinogenital disorders. It is indigenous to the plains of westerns

India. Clove and Neem are traditionally used to overcome toothache in various forms.

Figure 2 (c and d) represents the percentage inhibition of growth of microorganisms by the water extracts of three selected natural products i.e. Babul, Clove and Neem against various concentrations. Inhibition by natural products was less as compared to the commercially available oral care products may be because of the presence of ambiguous substances.

To conclude, human development as a process of evolution and advancements in knowledge have revolutionised the use of oral hygiene products so that more and more better products, both herbal and commercial, are increasingly used to maintain oral hygiene. Our findings suggest that both Synthetic as well as Herbal commercially available toothpastes were found to be equally effective in inhibiting growth of common oral flora. Close up (Synthetic) and Dabur Red (Herbal) were found to be the best amongst the oral care products tested. Mouth rinses were found to be very effective in controlling oral micro flora. AM PM was found to be very effective even in lower concentration as compared to Colgate Plax. Natural products are effective at higher concentrations against both the species of micro organisms tested.

References

1. Atlas R.M.: 1986, Basic and Practical Microbiology, Collier Macmillan Publishers, London, p.p. 666-685.
2. Bhatt K.R., Gokani S.J., Bagatharia S.B. and Thaker V.S.:2003; Antimicrobial activity of some medicinal plants- Comparison of methods employed and plants studied; Asian Journal of Microbial. Biotech. Env.Sc; 5 (4): 455-462.
3. Braude, A.I. 1980: Medical Microbiology and Infectious Disease; W.B Saunders Company; Philadelphia.
4. Davis B.D., R. Dulbecco, H.N. Eisen, H.S. Ginsberg and W.B Wood: 1981: Microbiology; Harper & Row Publishers; Hagerstown, Maryland.
5. Gultz J., Kaim J.M., DeLeo J. 4th, Scherer W., 1998; An *in vivo* comparison of the antimicrobial activities of three mouthrinses; J Clin Dent; 9(2): 43-5; PMID: 10518852.
6. Holt, J.G., N.R. Krieg, Sneath, J. Stanley, S. Williams, 1994: Bergey's Manual of Determinative Bacteriology, , Williams & Wilkins, 9th edition, Baltimore.
7. Ingraham, Catherine A. Ingraham : 2002, Introduction to Microbiology, Library of Congress Cataloging-in-Publication data, 2nd edition, p.p. 363-383.
8. Jonathan V. Wright, Lane Lenard: Sep 30, 2002: Xylitol Dental & Upper Respiratory Health
9. Kaim J.M., Gultz J., Do L., Scherer W. 1998: An *in vitro* investigation of the antimicrobial activities of an herbal mouthrinses, J Clin Dent, 9(2): 46-8; PMID: 10518853.
10. Pelczar, Jr. , E. C. S. Chan, Noel R. Krieg : 1993, Microbiology, Tata Mc Graw- Hill Publishers, 5th edition , New york, p.p. 73-78, 673-686.
11. Talaro Kathleen, Arthur Talaro: 2002, Foundations in Microbiology, Mc Graw Hill Higher Company, 4th edition, New York, p.p. 383-389
12. Wistreich George, Max D. Lechtman: 1980, Microbiology, Collier Macmillan Publishers, 3rd edition, London, p.p.582-595.

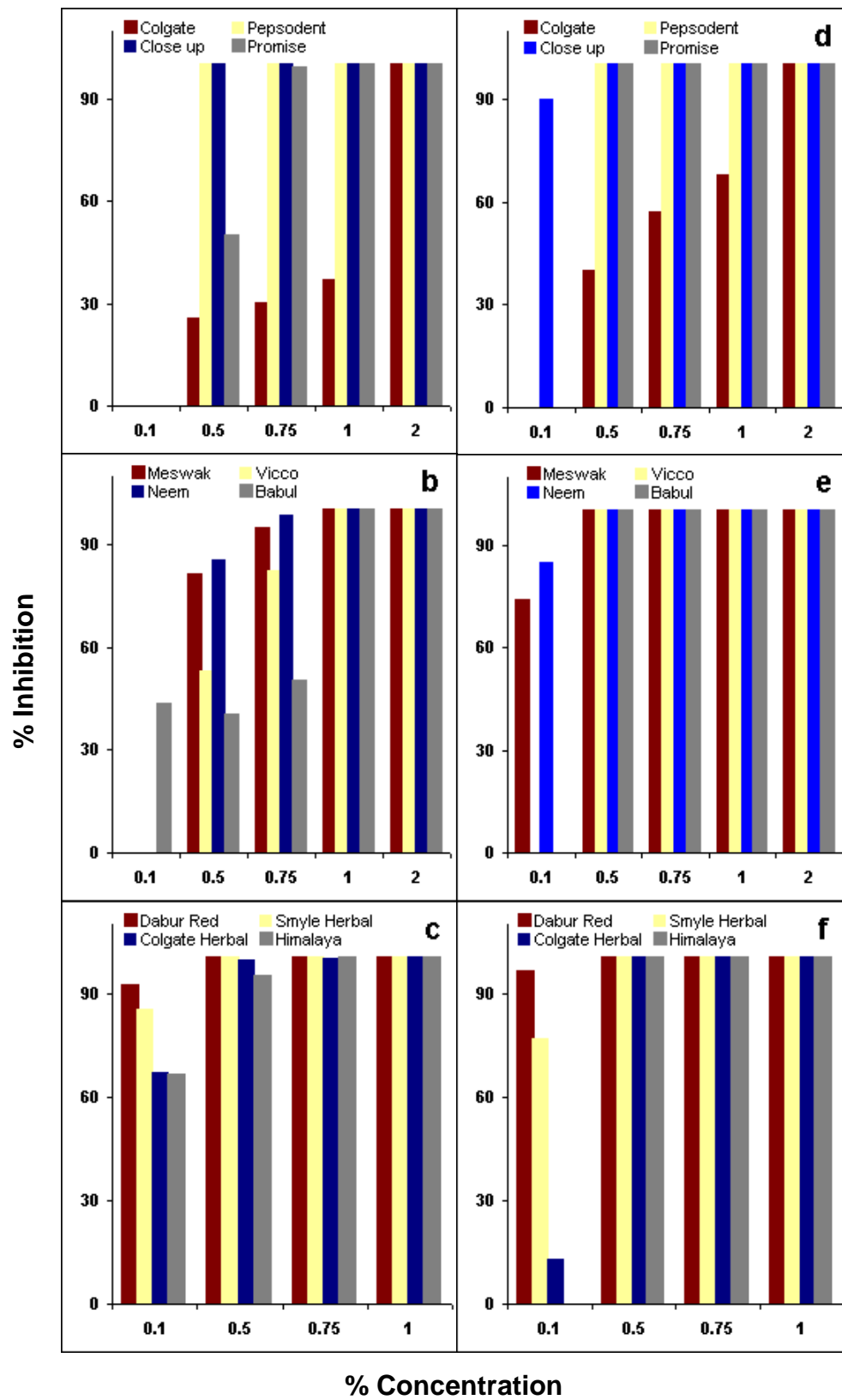


Fig. 1: Percent inhibition in growth of *S. pyogenes* (a, b and c) and *S. aureus* (d, e and f) against concentration of various tooth pastes.

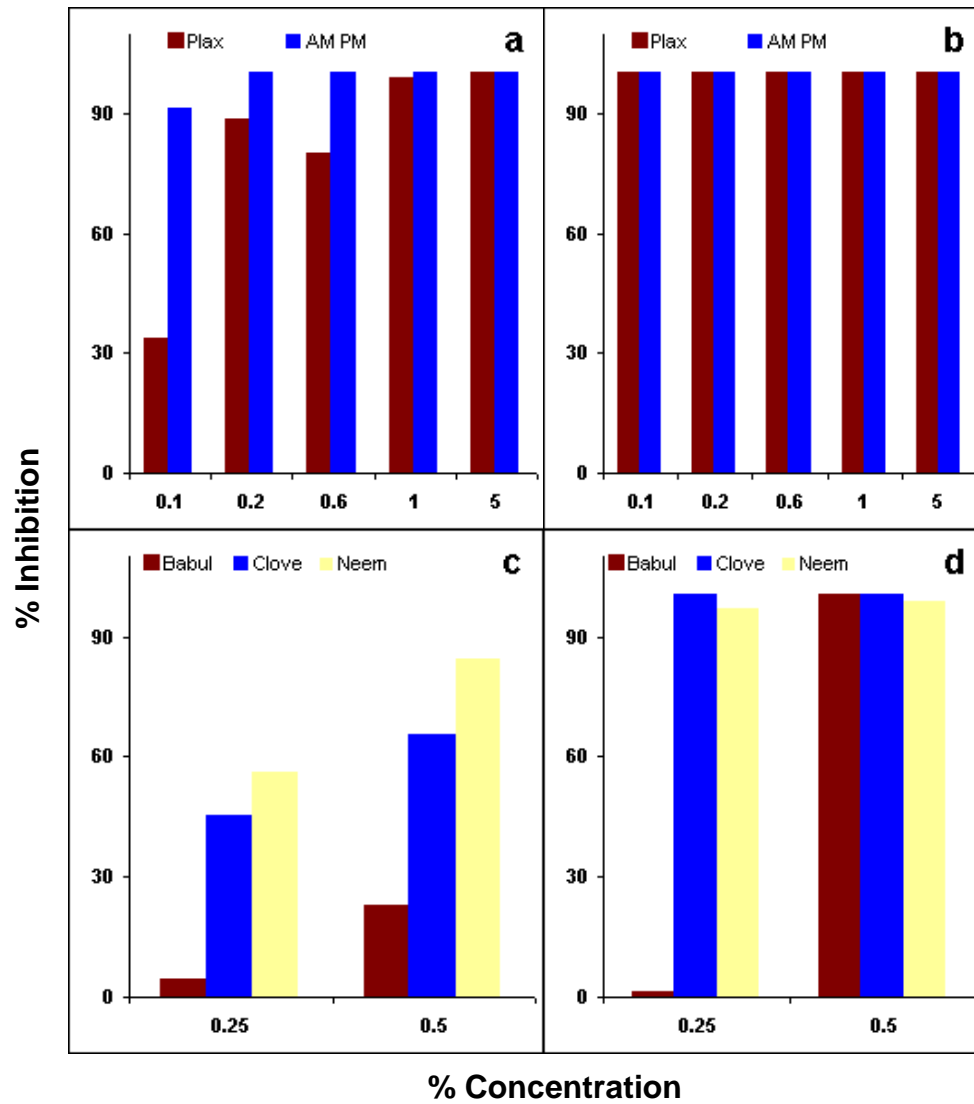


Fig. 2: Inhibition in growth of *S. pyogenes* (a, c) and *S. aureus* (b and d) against concentration when media was supplemented with different mouth rinses (a and b) and natural products (c and d).

The Emergency Contraceptive Pill: Boon or Bane

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Abstract:

Historically, human population growth has been controlled by limiting the population birth rate usually by government mandate, and has been undertaken due to high levels of poverty, environmental concerns, religious reasons and overpopulation. India is a country where primary health care facilities are lacking and the number of reported cases of AIDS is on the rise each day. However, awareness about reproductive health is sadly lacking. Hence launching of new drugs that aim to affect the reproductive health of the young adults, needs a responsible awareness campaign. ECP (emergency contraceptive pill) provides a safe and effective second chance to prevent pregnancy after unprotected intercourse or contraceptive failure. The pill was aimed to help rape and coercion victims from conceiving. It will also help in reducing maternal morbidity and mortality arising out of unsafe abortions and unwanted pregnancies. However, emergency contraception has taken over the market among India's increasingly educated and independent women. The rampant and unscientific use, OTC(over the counter) sales and misleading advertisements on emergency contraceptives have raised huge health concerns for young women. Also, since there are several oral contraceptives that have been made easily available by the government, there is no need for a dedicated product that is costly and out of reach for most of the population. There is also a need for the agencies to ensure that the ECP does not end up being used as a post coital contraceptive (PCC). The findings aim to highlight the after-effects of such drug abuse, the vulnerability of young adults to sexually transmitted diseases and the need for awareness amongst the youth towards emergency contraception.

Introduction

The development process has ushered in not only immense benefits but also several areas of stress and strain. Growing expenses, high cost of education and healthcare facilities have been plaguing developing economies. Hence, it has forced people to contain their family size. Human reproductive techniques have progressed rapidly in the past three decades and so have the available methods of population control. In developing countries, a new member in the family is no longer considered a helping hand but has become a liability. While population control can involve measures that improve people's lives by giving them greater control of their reproduction, some programs have exposed them to exploitation (Pence, 1998).

India is a country with a high number of AIDS cases (undetected cases of STDs and STIs) and where primary health care support is either unaffordable or lacking. Here the concept of safe sex and contraception related awareness does not

exist. The concept of an emergency contraception pill has been known since long. In ancient times, women used to douche themselves with potions, liquids and eat different types of food so as to abort a potential pregnancy. Present day women have modern ways of preventing pregnancy such as birth pills, emergency pills etc. What is currently known as an emergency contraceptive has been labelled as a morning after pill, postcoital pill, or contraceptive (PCP/PCC). With 55 crore people in India below the age of 25 and only around 20 percent of them having education till primary level, awareness regarding sexual and reproductive health is essential to break their taboos, myths and inhibitions. (Monica R, 2010). Lack of sex education in India, where attitudes towards safe sex are still more conservative than in the western world is one of the major cause of this rampant misuse of emergency contraceptive pills (Express Pharma, 2008).

Emergency contraception

Emergency contraceptive pills (ECPs)— simply referred to as emergency contraceptives (ECs) or the "morning-after pill"—are drugs intended to disrupt ovulation or fertilization. The ECP works by giving the body a short, high burst of synthetic hormones. This disrupts hormone patterns needed for pregnancy. It affects the ovaries and the development of the uterine lining, making pregnancy less likely. Depending upon the day of a woman's menstrual cycle, the hormones prevent pregnancy in different ways. It prevents ovulation (the egg leaving the ovary and moving into the fallopian tube). It blocks the hormones needed for the egg to be fertilized. It may affect the lining of the uterus and alter sperm transport which prevents the sperm from meeting the egg and fertilizing it (Leung et al, 2010; Gemzell et al, 2010; Hadley et al, 2000).

The regular Oral contraceptive pill works on the principle of prevention: it releases a low dose of hormones (oestrogen and progesterone) to inhibit ovulation, without which conception cannot occur. The morning after pill, on the other hand, works as an interceptive agent, so it is effective up to five days after unprotected sex. Ideally, it is encouraged to be consumed immediately. The difference is the difference between prevention and cure! It is a backup birth control device when regular contraception fails - expulsion of an intrauterine device (IUD), condom breakage or diaphragm displacement are examples. It is also an emergency option, such as in the case of rape victims.

OTC Nature of ECP

The "morning after" pill brands, which include i-pill, Unwanted 72 and Preventol, are readily accessible over-the-counter drugs throughout India, as they are in 40 other countries, including the U.S., U.K. and Australia. While the equivalent tablet being sold in Western countries contains 750 mg of the medicine, the i-pill contains double the dose ie 1500 mg. An alarmingly high utilization of emergency contraception has been reported by several agencies which are quite like the i-pill (FOGSI, 2003). The Indian government had promoted emergency contraception as an option

for women since 2002, and made it available over the counter in 2005. However in 2007, aggressive marketing through print and television media resulted in many young women becoming aware of it. Most women patients, when asked about their primary method of contraception in a survey, ended up saying they used the i-pill. This pill that is marketed as an emergency contraceptive pill, is sometimes used 3-4 times a month, say many doctors. Following the government's decision, the pills being made in India under three brand names like EC pill, E pill and Pill 72, are freely available at any chemist shop. Interestingly, the pill which earlier cost Rs 40, is now available for Rs 5 because it has now been included in government's social marketing list.

Concerns of health care providers

Doctors and health care workers worry that young women may be at risk by taking the morning-after pill too often. They say extreme convenience doesn't mean extreme safety or extreme rationality. Similar to Plan B in the U.S., the i-pill contains levonorgestrel, which, though generally considered safe, can cause side effects such as nausea, vomiting, weakness and menstrual changes. In fact most women are not even aware that the usage of the pill a few times a month could have negative consequences.

Doctors in India have also reported finding an increasingly high level of hormone changes in young women who are using the emergency pill three or four times a month, and are concerned that even though pregnancy may be avoided, by shunning condoms, women are making themselves vulnerable for sexually transmitted diseases, including HIV. Diseases like Herpes which were rare in the population are now being reported on a regular basis.

Role of the media

The advertisements, some experts say, use catchphrases like "tension free" to appeal to young women and do not emphasize that the products are meant for use in emergencies only. Though the upsurge in use of emergency contraceptives mostly affects women in India's cities, health advocates

are stressing the need for educating women in both urban and rural areas about the morning-after pill, which, when used wisely, can be instrumental in changing the way women approach sex. Seventy-eight percent of pregnancies in India are unplanned, and at least 25% are unwanted, according to FOGSI.

Like its counterpart Plan B in the United States, the i-pill contains levonorgestrel, which is considered safe but can pose some risks to diabetics, women with high blood pressure, women who are allergic to levonorgestrel or women who are already pregnant. In August 2006, the U.S. Food and Drug Administration made Plan B available over the counter but in a controversial move it restricted it to women over 18 because it said younger women needed medical supervision when taking the pill.

Short term side effects

Many users report heavy bleeding and nausea, though gynecologists say this is not dangerous. While Plan B is not believed to cause ectopic pregnancies, the **FDA recommends that doctors alert women** to that possibility if they complain of lower abdominal pain after taking Plan B. Experts feel, the morning-after pill should continue to be sold over the counter. What's needed, however, is proper sex education that covers how different contraceptives work. Many young women who seek medical help are not even aware of the differences between emergency contraception and preventive oral contraceptives. So when young girls arrive at the hospital, they're already in a crisis situation. We need a system that responds to young women and their reproductive health care concerns, in a modern evolving society.

Temporary disruption of the menstrual cycle is also commonly experienced. If taken before ovulation, the high doses of progestogen in levonorgestrel treatments may induce progestogen withdrawal bleeding a few days after the pills are taken. One study found that about half the women who used levonorgestrel ECPs, experienced bleeding within 7 days of taking the pills (Raymond et al, 2006). If levonorgestrel is taken before ovulation, it may increase the length of the

luteal phase, thus delaying menstruation by a few days (Gainer et al, 2006). (Delayed ovulation may result in a delayed menstruation.) These disruptions only occur in the cycle in which ECPs were taken; subsequent cycle length is not significantly affected (Raymond et al, 2006). If a woman's menstrual period is delayed by two weeks or more, it is advised that she take a pregnancy test (ACOG, 2005).

Long term side effects

One large study by the **World Health Organization** looked at the side effects of the two types of emergency contraceptive pills. About one in four (23%) women who use progestin-only emergency contraceptive pill, feels sick. A very small proportion of women (6%, or about one in 17) throw up after taking these pills. Nausea and vomiting are more common after taking "combined" emergency contraceptive pills: Roughly half (51%) of all women feel sick and about one in 4 (23%) throws up. Other common side effects (each reported by less than 20% of levonorgestrel-only users in both the 1998 and 2002 WHO trials) were abdominal pain, fatigue, headache, dizziness, and breast tenderness (WHO, 1998; von Hertzen et al, 2002; FFRPHC, 2006). Side effects usually do not occur for more than a few days after treatment. (Trussell J, 2006).

Prolonged use of the pills, reportedly lead to hormonal problems and the pill has also been known to cause bleeding and nausea. The carcinogenic characteristics of the pill have also not been completely ruled out. There is an absence of clinical trial data available in India of the said formulation.

Moreover, women who are administered the drug by a doctor, are called up for revisit to ensure that the abortion has been a complete one and that there are no remnants inside the body, posing a health hazard. Reports suggest, sometimes this pill fails which means the pregnancy has been established. A continued pregnancy may result in problems in the newborn, which need to be examined.

In fact even the medical fraternity is not completely aware of the effects. A survey among Delhi Medical Association doctors found that only 40% of them knew about the pill. There is not enough research on how teens are affected by these pills. Unrestricted sale of the pill may encourage irresponsible sexual behaviour. Even the US FDA wants to put an age restriction on OTC Plan B pill. The restriction would make patients younger than 16 obtain prescription from a doctor.

Conclusion

The morning after pill is conceived as an emergency contraceptive to be used when sexual intercourse takes place without using any contraceptives. The idea is that the availability of such a morning after pill will help reduce the number of abortions that take place, especially among the young. The safety issue is still being debated, as the doctors themselves have two opinions on the pill. Some rule out side effects like nausea or breast tenderness, usual effects that follow the intake of the regular pill. Another school says that the morning-after pills should only be used in an emergency, and not more than twice a week. It is reported to have caused menstrual irregularity and also severe stomach upset and nausea in some.

It is clearly specified that **making the morning after pill a regular habit is not a good idea**. For regular contraception, it is always better to opt for a regular contraceptive pill after consultation with a gynaecologist, or the simpler solution - use condoms (though condoms are not as guaranteed against conception and pregnancy as a contraceptive pill is.)

Gender inequity and cultural norms often make it hard to address the issue of contraception for adolescents. While condoms are available to adolescents in many countries, lack of power within relationships can make it difficult, if not impossible, for young women to negotiate condom use with their partners. In many cultures, sex-related issues are rarely discussed, even between spouses. Many young women also experience coerced sex. A review of 14 studies conducted in

developing countries found that 15 percent to 30 percent of sexually active girls reported that their first sexual experience was coerced (Jejeebhoy et al, 2003). The emergency contraceptive pill does not protect against any sexually transmitted diseases or HIV. It is purely to protect oneself from unwanted pregnancies after unexpected or unplanned unsafe sex. This is another reason why the morning after pill is not a good idea as a regular contraception method. Long term side effects of the emergency contraceptive pill (abuse) on adolescents need clinical trial data.

When it comes to educated people, they might use the i-pill once too often, not quite understanding the implications of it, despite having read about the risks. It's the same reason why people smoke despite knowing the risks and why people eat too much despite knowing that they are overweight.

The main aim of emergency contraception is to put the **decision of contraception in the hands of women**. In a patriarchal society like India, most women are not given the right to ask their partners to exercise contraception as the onus is on the woman to prevent pregnancies. 'Morning After' pills, has offered women a choice in case the contraception routine is accidentally broken. The government, interestingly, feels that the pill will come handy in preventing unwanted pregnancies, thereby reducing the population growth. Moreover, it weeds out conception related anxiety and also helps in improving their reproductive health. The government also needs to emphasise that emergency contraceptive pills cannot be used as public health measure (ICEC, 2006). Doctors stress the need for more counseling as the pills become more easily accessible in India.

References

1. Leung, Vivian W. Y.; Marc Levine, Judith A. Soon (February 2010). "Mechanisms of Action of Hormonal Emergency Contraceptives". *Pharmacotherapy* 30 (2): 158–168. doi:10.1592/phco.30.2.158. PMID 20099990. Retrieved 16 March 2011.
2. Gemzell-Danielsson, Kristina (November 2010). "Mechanism of action of emergency

- contraception". *Contraception* 82 (5): 404–9. doi:10.1016/j.contraception.2010.05.004. PMID 20933113. Retrieved 16 March 2011.
3. Hadley, Mac E. (2000). *Endocrinology*. Prentice Hall. pp. 467. ISBN 9780130803566.
 4. ICEC web page, section on "Products and Availability". Accessed 30 November 2006.
 5. WHO Task Force on Postovulatory Methods of Fertility Regulation (1998). "Randomised controlled trial of levonorgestrel versus the Yuzpe regimen of combined oral contraceptives for emergency contraception". *Lancet* 352 (9126): 428–33. doi:10.1016/S0140-6736(98)05145-9. PMID 9708750.
 6. von Hertzen H, Piaggio G, Ding J, Chen J, Song S, Bartfai G, Ng E, Gemzell-Danielsson K, Ouyunbileg A, Wu S, Cheng W, Ludicke F, Pretnar-Darovec A, Kirkman R, Mittal S, Khomassuridze A, Apter D, Peregoudov A; WHO Research Group on Post-ovulatory Methods of Fertility Regulation (2002). "Low dose mifepristone and two regimens of levonorgestrel for emergency contraception: a WHO multicentre randomised trial". *Lancet* 360 (9348): 1803–10. doi:10.1016/S0140-6736(02)11767-3. PMID 12480356.
 7. Piaggio G, Heng Z, von Hertzen H, Bilian X, Linan C (2003). "Combined estimates of effectiveness of mifepristone 10 mg in emergency contraception". *Contraception* 68 (6): 439–46. doi:10.1016/S0010-7824(03)00110-0. PMID 14698074.
 8. Trussell J, Raymond EG (April 2007). "Emergency contraception: a cost-effective approach to preventing unintended pregnancy" (PDF). Princeton University. Retrieved 2007-07-03.
 9. FFRPHC (2006). "FFRPHC Guidance (April 2006). Emergency contraception" (PDF). *J Fam Plann Reprod Health Care* 32 (2): 121–8.
 10. Raymond E, Goldberg A, Trussell J, Hays M, Roach E, Taylor D (2006). "Bleeding patterns after use of levonorgestrel emergency contraceptive pills". *Contraception* 73 (4): 376–81. doi:10.1016/j.contraception.2005.10.006. PMID 16531171.
 11. Gainer E, Kenfack B, Mboudou E, Doh A, Bouyer J (2006). "Menstrual bleeding patterns following levonorgestrel emergency contraception". *Contraception* 74 (2): 118–24. doi:10.1016/j.contraception.2006.02.009. PMC 1934349. PMID 16860049.
 12. Gemzell-Danielsson K, Marions L (2004). "Mechanisms of action of mifepristone and levonorgestrel when used for emergency contraception". *Hum Reprod Update* 10 (4): 341–8. doi:10.1093/humupd/dmh027. PMID 15192056.
 13. American College of Obstetricians and Gynecologists (2005). "ACOG Practice Bulletin. Clinical Management Guidelines for Obstetrician-Gynecologists, Number 69, December 2005. Emergency contraception". *Obstet Gynecol* 106 (6): 1443–52. doi:10.1097/00006250-200512000-00052. PMID 16319278.
 14. Jejeebhoy SJ, Bott S. Non-consensual Sexual Experiences of Young People: A Review of the Evidence from Developing Countries. New Delhi, India: Population Council, 2003.
 15. FOGSI Policy Statement - Emergency Contraception - September 2003.
 16. Pence, G.E. (1998b). *Who's afraid of human cloning?* Lanham, MD: Rowman & Littlefield.
 17. Populationconcern.org.uk

Body Statistics

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Abstract:

Physical exercise constitutes an essential component of good health.. Exercise is a natural part of life and a survival strategy. Movement and exercise increases breathing and heart rate so that more blood flows to the brain enhancing energy production and waste removal. There are various forms of physical exercises and gyming is one form of physical exercise that is in vogue in recent times. This article seeks to explore the relationship between gyming and statistics. In fact Body statistics which constitutes a major branch of science is still an unexplored terrain. In this paper an attempt is made to study the effectiveness of different sets of exercise for body toning and general fitness. Further it analyzes and compares the changes observed on various body parts like chest, shoulders, thighs, arms etc.

Introduction

The benefits of exercising are well documented. Exercise is important in preventing illnesses. A sedentary lifestyle makes us susceptible to illnesses of various kinds, weakens our muscles and may result in muscular dystrophy, a debilitating condition. Regular exercise strengthens muscles and bone and is especially helpful for those who indulge in strenuous physical activity. A healthy proportion of muscle and fat contributes to a great body structure, something that all find attractive. Also, they say that when you look good, you feel good.

The physical exercises were grouped into the following three categories: Flexibility exercises, such as stretching, improve the range of motion of muscles and joints. Aerobic exercises, such as cycling, swimming, walking, skipping rope, rowing, running, hiking or playing tennis, focus on increasing cardiovascular endurance. Anaerobic exercises, such as weight training, functional training, eccentric training or sprinting, increase short-term muscle strength. Studies and researches across the world have conclusively proved that reducing weight and managing body fat leads to a higher life expectancy and better quality of life.

Objectives

The aim of the paper was to study the effectiveness

of different sets of Gym exercise for body toning and general fitness over a span of 3 months. The objective of the study was to examine whether Gym Exercises are effective for weight reduction and for weight gain. Further an attempt is made to assess predictive relationship between change in weight (Dependent Variable) and change in sizes of various body parts (Independent Variables) viz Change in Chest Normal (inches), Change in Chest Expanded (inches), Change in Shoulder (inches), Change in Arms (inches), Change in Waist (inches), Change in Thighs (inches), Change in Calves (inches), Change in Body Mass Index.

Methodology

The data was collected from “Fitness Hour” gym in Dahisar. A sample of 30 members was taken with each member having completed 3 months of exercise. Each member was either put into Weight gain or Weight loss category over a period of 3 months. Generalized set of exercise includes Flat Bench Press, Pec-Dec, Incline Fly for **Chest**, Overhead Double Bar Press, Front Raise, Lateral Raise, Up-Right Row for **Shoulders**, Lateral Pull Down, One-Arm Row, Seated Row, Shrugs for **back**, Double Bar Curl, Preacher Curl, Pully Curl, Hammer Curl for **Biceps**, Pulley Push Down, Double Bar Triceps, Reverse Double Bar for **Triceps**, Lunges, Squats, Leg Press, Leg Extension, Leg Curl, Calf-Raise for **Legs**, Treadmill (10 MIN), Cross Trainer (10 MIN),

Cycling (10 MIN), Stretching under **Cardio**. Measurements of each body part were taken on a regular basis viz. before starting exercise and after completion of three months. Change was recorded by measuring the difference in all the variables before and after onset of exercises.

Significance of Exercise

Here paired t-test is used to test the effectiveness of gym exercises for weight reduction over a period of three months.

Table 1: Paired Samples Test for weight reduction

		Paired Differences					t	df	Sig.(2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	before - after	4.17875	5.77242	1.44310	1.10284	7.25466	2.896	15	.011

As per Table 1, P-value is found to be $0.011 < 0.025$ which is significant at 5% level of significance. Hence we conclude that gym exercises are effective for weight reduction over a period of 3 months.

Table 2: Paired Samples Test for weight gain

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	before - after	-2.97857	1.15969	.30994	-3.64816	-2.30898	-9.610	13	.000

Similarly, t-statistics is found to be -9.610 for weight gain and P-value is 0.000. Hence, we conclude that gym exercises are effective for weight gain over a period of 3 months.

Impact on Body Weight:

To study the effect of changes in various body parts on change in body weight. The process model is designed where dependant variable is change in weight and 8 independent variables as mentioned above are used.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
1	.984 ^a	.969	.964	1.05819

a. Predictors: (Constant), Change in Thighs (inches), Change in Arms (inches), Change in Chest_Normal (inches), Change in Waist(inches)

b. Dependent Variable: Change in Weight in kgs

R square value and adjusted R square value are almost same for the model as well as standard error of estimate is small for the model. Hence model found to be significant in Table 3.

t-test is used to test linearity of each co-efficient and it is found that co-efficient of change in chest normal, change in arms, change in waist and change in thighs are significant.

	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	t	Sig.
1 (Constant)	-.308	.214		-1.441	.162
Change in Chest_Normal(inches)	1.873	.329	.593	5.694	.000
Arms (inches)	.245	.074	.172	3.303	.003
Waist (inches)	1.070	.203	.755	5.274	.000
Thighs (inches)	-.705	.395	-.299	-1.785	.086

a. Dependent Variable: Change in Weight (kgs)

The research hypothesis for the F test claims that there is some predictive relationship between the X variables (independent) and Y variable (dependent) in the population.

Model		Sum of Squares	Degree of freedom	Mean Square	F	Sig.
1	Regression	865.088	4	216.272	193.139	.000 ^a
	Residual	27.994	25	1.120		
	Total	893.082	29			

b. Dependent Variable: Change in Weight (kgs)

Since the p-value found to be less than 0.05 in Table 5, hence the result found to be significant for the model.



The above Figure 1 satisfies normality of residuals and Scatter plot shows no problem. Hence assumption of homogeneity of variance is satisfied.

Conclusion

Hence there is linear relationship between change in weight and change in Chest normal, change in arms, change in waist and change in thighs. Hence working on only these body parts one can gain or lose weight effectively.

The mushrooming of gyms in the wake of liberalization and globalization and the intense consciousness that it has generated on matters pertaining to health has produced a unitary

discourse on health and beauty that needs to be interrogated.

References

1. Michael S. Lewis Beck: Regression Analysis, International Handbooks of Quantitative Applications in the Social Sciences, Volume 2, Sage Publication, 1993.
2. Damodar Gujarathi, Sangetha: Basic Econometrics, McGraw Hill Companies, Fourth edition, 2010, pp1-517.
3. Darren George & Paul Mallery: SPSS For Windows, Dorling Kindersley Pvt. Ltd. licensees of Pearson Education in South Asia, 2009.

Studies on Water Pollution of Mithi River: Reasons and Recommendations for Control

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Abstract:

Mumbai the economical capital of India faced the heavy rains on July 26, 2005. The problems faced by Mumbai were then studied for the root cause of the heavy water clogging and the resultant losses to the property and lives. The major conclusion drawn by almost all worker that it was due to excess of plastic and solid wastes thrown to the already interrupted flow of Mithi river. The purpose of this work was to study the pollution level of Mithi river about 6 years after the balk day and to review the success of pollution control measures taken and improvement in the situation. Though the level plastic is not included in this work as pollutants, the other pollutants have remarkable presence still in the Mithi water and the situation is alarming for the BMC.

INTRODUCTION

Mumbai is made up of seven islands and is located on the west coast of India. The seven islands are formed due to the meeting of several rivers that flow into the Arabian Sea. These rivers supply about 70% of the required water to this metropolis in the form of major water reservoirs like Powai, Vihar, Vaitarna and Tansa lakes.

Mithi river originates near the Powai lake and flows through the residential suburban areas of Powai, Saki Naka, Kurla, Bandra and Mahim, meeting Arabian sea through Mahim Creek. The total flow length [1] of Mithi river is over 15 km according to Brihanmumbai Municipal Corporation (BMC).

July 26, 2005, was the day when due to heavy rains Mumbai came to a grinding halt. One of the main reasons for the flooding was pollution of the Mithi river.

The river at its starting point contains good portable water. But unfortunately the mushrooming of industries on the banks of the river and residential buildings around it, have polluted the river. Preliminary survey indicates that the pollution level of Mithi water has reached alarming levels.

Mahim Bay area, where Mithi river meets Arabian sea, is a nominated bird sanctuary called, “**Salim Ali Bird Sanctuary**”, where migratory birds come for nesting. This part is full of mangroves and this fragile eco system has to be protected.

A study was undertaken to examine the pollution levels of Mithi around six years after the flooding. Various physical and chemical pollutants were measured (excluding plastic) at four locations and then the pollution level was correlated with the geographical / local area.

EXPERIMENTAL PROCEDURES

Water Samples

Mithi river is subject to tidal variation. In order to get proper idea of population load in high and low tide, sampling schedule was spread over a 12 day period. Four (4) sampling points were selected starting from the origin as listed in Table 1. Sediment samples were collected from the river bed at the same locations.

Chemicals

All the reagents used for analysis were of AR or LR grade (SDS, LOBA, BDH- INDIA make) and were weighed on Metler single pan digital balance with sensitivity of 0.01 mg, to make the required solution in double distilled de-mineralized

distilled water (or suitable solvent where ever required)

EQUIPMENT AND PROCEDURE

a. *Equiptronics* digital spectrophotometer was used for the optical density measurements. The equipment was calibrated every time using KMnO_4 solutions.

c. The glassware used were all made up of Borosilicate glass. The burretes, pipettes and standard flasks were of B- grade and were calibrated using standard methods.

d. All the water analysis experimental procedures were taken from Vogel's [1] Textbook of Quantitative Chemical Analysis. All experiments were repeated for reconfirmation of the readings performing the parallel set of experimental solutions.

Table 1: Information on Sample collected

Para-meter	Sample A	Sample B	Sample C	Sample D
Location	Vihar Lake, Powai	M.I.D.C., Sakinaka	Kalana gar, Bandra	Mahim creek
Date of Samp-ling	Aug 28, 2011	Sept 4, 2011	Sept 9, 2011	Aug 28, 2011
Purpose /criteria	Starting Point	Near industrial Area	Badly Flood Affected Area	End Point
Color and nature	Little hazy, light brownish	Dark brownish with particles	Brownish black heavy particles	Black muddy
odour	No specific	characteristic	Mild smell of rotten eggs	Strong irritating

Collection method	Direct in bottle	Inner bulk	Excluding plastic & large particles	After stirring, Excluding plastic & large particles
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(The samples are referred as A, B, C and D here after.)

EXPERIMENTAL RESULTS

The solid impurities like plastic and bigger size particles were reported [2-6] as the root cause of the floods of July 26, 2005 by the BMC. The samples collected for this analysis were collected selectively excluding this plastic and bigger particles (refer Table 1). This study covers analysis of the samples for basic parameters [like total suspended solids (TSS), total dissolved solids (TDS), total solids (TS) and Oil Grease], Chemical parameters [like hardness, alkalinity, COD, Dissolved Oxygen, Sulphates, Dissolved Chlorine and Nitrates] and Instrumental analysis of metallic pollutants [like Fe, Cr and Mn]. Besides the reported results the pH values of the samples were measured and are recorded 7.2, 8.9, 8.5 and 8.1 for sample A, B, C and D respectively.

Physical analysis

In the first part, parameters like total suspended solids (TSS), total dissolved solids (TDS), total solids (TS) and Oil Grease were measured. TSS, TDS and TS were measured using classical titration method while oil and grease by evaporation of solvent after solvent extraction of oil in chloroform. The obtained results are listed in Table 2.

Basic Chemical Analysis

The alkalinity of the samples were measured as alkalinity in terms of carbonate, bicarbonate and total alkalinity is reported in Table 3, which also has the data on hardness in terms of calcium, magnesium and total hardness. Both alkalinity and hardness were measured using classical method. All experiments were repeated minimum thrice and the reported results are averages of the sets of each sample.

Table 2: Results on physical measurements of the water samples

Parameter	Sample A	Sample B	Sample C	Sample D
TSS (ppm)	90	105	78	90
TDS (ppm)	1290	1705	1492	1535
TS (ppm)	1380	1810	1570	1625
Oil Grease (ppm)	15	34	110	80

Table 3: Results on measurements of Alkalinity and Hardness

Parameter	Sample A	Sample B	Sample C	Sample D
ALKALINITY (ppm)				
CO ₃ ²⁻	10	10	10	10
HCO ₃ ⁻	7.5	8.3	9.05	8.9
Total alkalinity	1710	1890	2010	1980
HARDNESS (ppm)				
Ca Hardness	11.05	13.01	16.44	15.82
Mg Hardness	46.25	56.38	43.89	47.52
Total Hardness	57.30	69.39	60.33	63.34

Classical Chemical Analysis

The classical method of analysis was used to determine the parameters like Chemical Oxygen Demand (COD), dissolved Oxygen (DO), Sulphate, Dissolved Chlorine and nitrate in the water samples. A constant trend is obtained in all parameters. The sample-B that was collected near Kurla showed maximum level of pollutants. This area is a small scale industrial belt located on the bank of the river Mithi.

The summary of the experimental data is given in Table 4.

Instrumental Chemical Analysis

Metallic impurities were tested using instrumental methods of analysis. The procedure involved preparation of standard solution and construction of calibration curve. Using the generated

calibration curve the water sample (diluted to as per the requirements) was treated in the same way to get the concentration. The results listed in Table 5 indicate variation in pollutant concentration with the location of sample collection.

Table 4: Results on measurements of classical chemical analysis

Parameter (ppm)	Sample A	Sample B	Sample C	Sample D
COD	10.2	9.8	9.3	9.5
Dissolved Oxygen	92	82	76	73
Sulphate	0.58	0.73	0.65	0.62
Dissolved chlorine	39.3	47.2	42.8	43.2

Table 5: Results on Instrumental Analysis

Parameter	Sample A	Sample B	Sample C	Sample D
Nitrate	0.9	1.9	1.65	1.35
Fe (ppm)	0.592	0.892	0.793	0.698
Cr (ppm)	4.5	5.2	4.98	4.75
Mn (ppm)	11.8	15.4	12.92	13.54

DISCUSSION AND RECOMMENDATIONS

Mithi river passes through an area with lot of industrial activity and high density of population. It was expected to detect typical pollution parameters like Oil and Grease, COD or Heavy Metals etc., where industrial activities took place. Though analysis indicated such heavy metals, their levels were not strongly alarming to call it purely a chemical pollution. This may be due to cumulative discharge of domestic sewage (including animal waste from cow sheds) in the river right from origin at Powai to Mahim creek. Domestic sewage volume from this area is much more than industrial effluent discharged and may have diluted chemical pollution.

The results clearly indicate that the pollution has more amount of dissolved solid as compared to the suspended solids. This is because it is close to residential areas and major slums. At sampling

point B the level of pollutants like oil, grease and metallic impurities was high as it is near an industrial belt. Then the pollution level goes down a little bit as the Bandra residential area adds relatively less polluted water which dilutes the pollutant effect and this remains contained till the Mahim Creek where the tides make the water a little better.

The efforts taken by the municipal corporation to reduce pollution levels have not met with the desired results. The implementation of the following measures could drastically reduce the levels of pollution.

1. Proper stone boundaries have to be erected on both the banks of the river so as to stop the unauthorized construction taking place every day.
2. Two artificial lakes can be created near Vikhroli and Kurla which will add to the beautification of the city. If a boating club is established by the municipal corporation it can also generate good revenue.
3. Small gardens can be developed on both the banks of the river which will be a natural source of reducing pollution.

4. Beautification of the area will encourage the residents to protect the area.
5. The screening of the river water should be done at several places to prevent solid wastes from polluting the river. This solid waste and plastics can be cleaned at regular frequency and sent to dumping grounds or solid waste treatment plants.

References

1. Vogel's Textbook of Quantitative Chemical Analysis, fifth edition, ELBS, Longman publication, 1989.
2. "Maharashtra govt. to clear up blockages in Mithi river course" in.rediff.com/news/2005/aug/05rain.htm dated August 05, 2006.
3. Shibu Jagdevan www.indianngos.com/issue/water/resources/articles-mithiriver.htm
4. Miloni Bhatt www.ndtv.com/morenews/showmorestory dated June 11, 2006.
5. Harish Menon , Indo-Asian News Service, in.news.yahoo.com on Sept 03, 2006.
6. Chandrashekhar Prabhu "Why Mumbai choked?" www.hinduonnet.Com /fline/fl2217 /stories /20050826004601700

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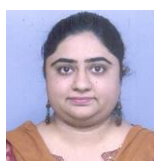
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