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Table Of Contents

1. An Exploratory Study on Rugs & Bathmats of Panipat
Rena Mehta, Kusum Lata Joria p 1
2. A review article on relation between metabolic syndrome, general wellbeing and yogic lifestyle.
Deepak Kumar, Sartaj Ahmad, Saurabh Sharma p 5
3. Negative marking system with special reference to S. Nelson Prabhakar v. CBSE
Prem Chandra, Vaibhav Goel Bhartiya p 11
4. A Descriptive Study To Assess The Health Related Quality Of Life In Terms Of Knowledge And Attitude Among Patients With Thalassemia Attending OPD In Selected Hospitals At Meerut With A View To Develop Information Booklet
Aamir Khan, Geeta Parwanda p 14
5. Socio- Legal Issues of Surrogacy : An advanced assisted reproductive techniques (ART)
Sartaj Ahmad, Vaibhav Goel Bhartiya, Reena Bishnoi, Manoj Kumar Tripathi p 20
6. Mass Spectroscopy- A current review
Rakesh Kumar p 25
7. Criminalization Of Marital Rape: Judicial Trends
Akanksha Marwah p 28

Editorial

Warm Greetings to all our Readers,

Dear Colleagues

With a sense of deep appreciation, we hereby present to you the August 2019 issue of “**Subharti Journal of Interdisciplinary Research**” of our prestigious Swami Vivekanand Subharti University. During the time period since the April 2019 issue, our journal, and our nation saw a sea change in many spheres.

Let us talk about the nation first. The biggest festival of democracy, “The General Elections” commenced on 11 April 2019 and concluded on 19 May 2019. This festival saw the maximum voter turnout in terms of percentage and the results were declared on 23 April 2019. The people of India voted for a stable government at the centre and the new government at the helm of affairs has got a humongous task to live up to the expectations of one and all.

India Space Research Organization launched its successful mission Chandrayaan 2 to moon and has made all Indians proud and these moments will forever be etched in the minds of one and all. We at Subharti salute the prowess of our scientists and wish them success to explore new frontiers of space.

Let's now bring our focus back home i.e. our own Journal. The journal was indexed with the National Science Library and ISSN Number 2581-8716 (online) was assigned to it. Another landmark achieved was that the journal is now indexed with Google Scholar also. Both of these tasks have been possible only due to the untiring and persuasive efforts of the editorial team. We at the editorial office have a positive attitude and constantly strive to give our best. The challenges ahead are bigger but with the support of all our authors and readers, no climb is going to be too hard.

The editorial team is already in the process of getting the journal indexed with Baidu Scholar, CNKI (China National Knowledge Infrastructure), SCOPUS etc.

I would like to say Thank you to all those who have contributed to this issue of the journal. We look forward to welcoming your submissions for next issue and your valuable suggestions are eagerly awaited at journal@subharti.org.

Happy Reading

Dr Vijay Wadhwan

Editor-in-Chief

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Original Study

An Exploratory Study on Rugs & Bathmats of Panipat

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Abstract:

Indian rugs and bathmats have their own charm and class in present era. However, Panipat bathmat and rugs are much in demand in India and abroad as they have impact of both historical tradition and there is a small market for rugs and bathmat in India. Hence forth, their potential to earn foreign exchange and to give employment to people alike cannot be overlooked. The study of rugs and bathmat in Panipat was conducted with the help of an interview schedule to find out the process of developing rugs and bathmat by taking almost all the steps in to account like selection of raw material, finishing, dying, weaving, tools, loom, designing and after treatment of carpets. 50 Rugs and bathmat unit were selected for the study. The study revealed that Rugs and bathmat have earned a legendary reputation in Panipat all over the world due to their magnificent traditional and contemporary patterns, wide range of size and shapes in different colors, fineness of knotting and lasting durability. In Panipat use of dark colour like red, yellow, blue & ivory is more prominent in the Rugs Bathmats but some time light shades are also used according to buyers demand.

Keywords: Rugs, Bathmat, Carpet, Panipat

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Introduction

Floor covering is a term to generically describe any Finish material applied over a floor structure to provide a walking surface¹. Flooring is the general term for a permanent covering of a floor, or for the work of installing such a floor covering. Both terms are used interchangeably but floor covering refers more to loose-laid materials². Materials almost always classified as floor covering include carpet, area rugs, and resilient flooring such as linoleum or vinyl flooring. Materials commonly called flooring include wood flooring, ceramic tile, stone, terrazzo, and various seamless chemical floor coating³. The choice of material for floor covering is affected by factors such as cost, endurance, noise insulation, comfort and cleaning effort. Some type of flooring must not to be installed below grade (lower than ground level), and lamination or hardwood should be avoided where there may be moisture or condensation⁴. There are number of special features that may be used to ornament a floor or perform a useful service. Examples including Floor medallions which provide a decorative centerpiece of a floor design, or Gratings used to drain water or to rub dirt off shoes⁵.

Home Textile Production in India

The Home Textile Industry is quite widespread in India. There are a number of centers in India where the production of home textile has been undertaken since

decades. Panipat situated in the state of Haryana and about 100km from India's capital, New Delhi is traditionally known for its light and medium rugs and durries, 'chindi' or fabric and leather scrap durries, and handloom and hand-tufted carpet of contemporary design. This city is also well known for its manufacturing and export of woven made-ups. Keeping pace with global demands India's largest hand weaving center, Panipat, which export about Rs 800 crore worth of home textile products⁶. Producers in Panipat have of late started experimenting with different fabrics such as polyester, silk and poly silk. Some producers have also started the use of natural fabric such as bamboo and soya. Panipat has certain limitations which prevent it from reaching its full potential lack of mechanization and skilled manpower, lack of proper organization as well as lack of efficient infrastructure facilities. Palliwal Export, SRJ Textiles Pvt. Ltd, Mahajan Overseas and liberty are some of the eminent players in Panipat in terms of home textiles. The handloom products of panipat such as carpet table covers, mats, bed sheets and curtains, have occupied a prominent place in the international markets. With the trade flourishing, new units are coming up in panipat. The district is currently also turning out new products such as shoddy and acrylic, polypropylene and shoddy yarns. There are currently about 65 companies exporting a wide range of product such as mats, table covers, bed sheets, curtain and carpet to the USA, France, Canada, Japan, Spain, Germany and Australia. To cater to the burgeoning overseas

demand, tradition handlooms are now being replaced by power looms, shuttles less loom and automatic machines⁷. Objectives of the study comprises of the documentation of the company profiles, variety of rugs & bathmats constructed in the manufacturing units.

Classification of Rugs

Hand knotted Rugs	Handmade Rugs	Machine Made Rugs	Loop & Pile Rugs	Chindi Rugs
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Classification of Bathmats

Cotton Bathmats	Tufted Bathmats	Chenille Bathmats	Yarn dyed Bathmats	Shaggy Bathmats
Reversible Bathmats	Multicolored Bathmats	Jute Dari & Flooring		

Classification of Carpet

Woven Carpet	Loop Pile	Cut Pile Carpet	Knotted pile weave	Needle Felt
Embroidered Carpet	Tufted Carpet	Persian Carpet	Kids Carpet	Plain Acrylic Carpet

Methodology

A qualitative approach was used to procure the information of the rug & bathmat industries of Panipat. Interpretation was done based on the information gathered using a semi structures interview schedule. In depth information on the topic of study was collected from focus group schedule created on an extensive review of literature. The interview schedule comprised of both open and closed ended questions.

Selection of Sample

Cluster of Panipat home hold a huge furnishing industry holds a huge number amongst the other sectors in India. A total number of 1920 manufacturing units exists in the region of Panipat. Out of the total (Rugs-50 Bathmat-50) were selected. Information was procured by manufacturers and workers of the rugs and bathmat manufacturing units. Apart from primary source of data collection historical literature, newspapers, documentaries & internet were surfed as the secondary source of information. Tool for data collection comprised of interview schedule.

Results and Discussion

A thematic interpretation of interviews and focus group discussion led to the development of actual facts and responses of the respondents. This Study focuses on finding the relevant information about cluster of Panipat manufacturing rugs & bathmats. Each table & graphs gives the statistics of the response from the sample of fifty units of Bathmat and fifty of Rugs manufacturing. Maximum no of units have established with an invested amount of 1,00,000 - 2,00,000Rs. Some units have established with 2,00,000-3,00,000Rs and minimum number of the units have established with less than

50,000. Now a days the amount of investment is about 7,00,000Rs.

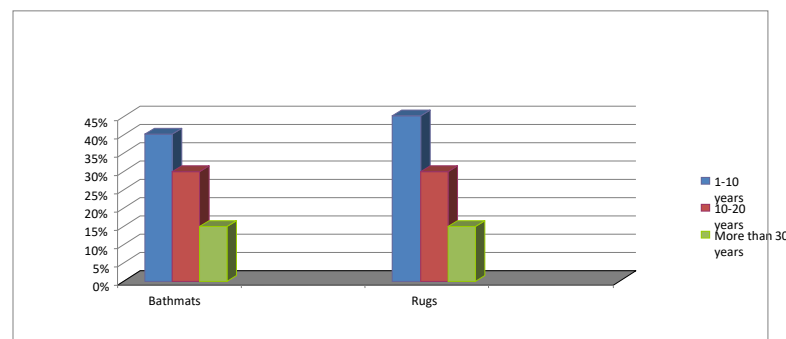


Fig 1: Year of Establishment of the unit

Above statistics revealed that most of the units were established more than 30 years ago as it was the ancestral business taken up by the young generation.

Table 1: Amount invested for the establishment of the unit

Amount	Bathmats Units		Rugs Units	
	Frequency (n)	% age	Frequency (n)	% age
Less than 50,000	10	10	20	20
50,000-1,00,000	30	30	30	30
1,00,000-2,00,000	40	40	30	30
2,00,000-3,00,000	20	20	20	20

Table 2: Numbers of workers employed in the units

No. of workers	Bathmats Units		Rugs Units	
	Frequency (n)	% age	Frequency (n)	% age
10-50	20	20	20	20
50-100	60	60	60	60
100-150	15	15	15	15
More than 200	5	5	5	5

Most of the unit have employed 50 to 100 work force followed by some of the unit have employed 20 workers followed by some of the unit have employed more than 150 workers in the units. The working shift of the worker; most of the worker work in morning while minimum number of the worker work in evening shift. Actual number of workers was not stated by the owners as with exceeding number of people engaged in the unit the manufacturing units might come under large scale enterprise, on the contrary the registered units were small scale.

Table 3: Type of worker working in unit

Criteria of selection	Bathmats Units		Rugs Units	
	Frequency (n)	% age	Frequency (n)	% age
Skilled	40	40	40	40
Semi skilled	40	40	40	40
Unskilled	20	20	20	20

In bathmat and rugs unit have similar number of skilled and semi-skilled worker while minimum number of the unit have minimum number of unskilled worker. Skilled worker were working in rugs weaving while semis

skilled were working in tufting of bath mats. That's why rugs cost is high and bathmat cost is less.

Manufacturing of the Rugs & Bathmats

The units of Panipat are famous for creating a variety in creating the rugs & Bathmats. The production Process of the manufacturing of rugs (Fig 3) starts with dyeing of thick cotton yarns using Reactive and Direct dyes. The weft yarns are winded in the shuttle and warp yarns are wrapped on the loom. The yarns are woven into rugs and later are subjected to finishing and packaging. Fig 4- types of rugs manufactured in the units.

Manufacturing of Rugs



Fig 3a: Dyeing of Yarn



Fig 3b: Dyeing of Yarn



Fig 3c: Entanglement of Yarn



Fig 3d: Winding of weft yarn



Fig 3e: Warping Machine



Fig 3f: Warping of yarn



Fig 3g: Weaving of Rug



Fig 3h: Finishing of rug

In manufacturing of Bathmats, Canvas is cut of the desired shape. The size and shape of the bathmat is not fixed. Yarns are either dyed prior to tufting or are tufted on canvas and then dyed. Piece dyeing is the technique used to dye the bathmats.(Fig 5)

Table 4: Marketing of the products

Sources selling	Bathmats Units		Rugs Units	
	Frequency (n)	% age	Frequency (n)	% age
Domestic Market	15	15	15	15

Export	80	80	80	80
Other(Retail outline)	5	5	5	5

Maximum number of the units of bathmat and Rugs exported their product in USA and Canada. Some of the units were sell their products in domestic market and minimum numbers of units sell their products to retail outline

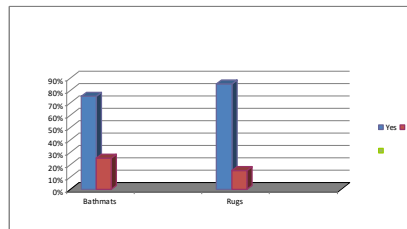


Fig 2.

Participation of unit owners in trade, fair, exhibition for their products

Most of the units of bathmat and rugs participated in fairs & exhibitions. Majority of the owners

Table 5: Distribution of units according to the use of loom

Loom	Bathmats Units		Rugs Units	
	Frequency (n)	% age	Frequency (n)	% age
Handloom	-	-	60	60
Pit loom	-	-	30	30
Tufting Machine	80	80	-	-
Embroidery	20	20	10	10

It was observed that 80 per cent of the units manufacturing bathmat used tufting machine and 20 per cent used embroidery machine. 60 per cent of the Rugs manufacturing enterprises used handloom and 30 per cent use pit loom whereas only 10 per cent used embroidery machine since non embellished rugs are

Fig 4. Types of Rugs Manufactured



Fig.4a
Handmade Rug



Fig.4b
Loop of Pile Rug



Fig.4c
Fancy Rug



Fig.4d
Chindi Rug



Fig.4e
Knotted Rug



Fig.4f
Fancy Rug

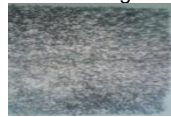


Fig.4g
Fancy Rug



Fig.4h
Chindi Rug



Fig.4i
Zigzag Rug



Fig.4j
Rug with fringe



Fig.4k
Loop Rug



Fig.4l
Embroidered Rug



Fig.4m Braided Rug
Fig.4n Rug with fringe
Fig.4o Loop & pile Rug
more in demand. Handloom and pit loom were the two types of handloom used in rugs weaving. Handloom is the basic type of loom. Tufting Machine is the basic machine for manufacturing Bathmat. The Bathmats are washed, labeled & Packed.

Fig. 5 Manufacturing of Bathmats

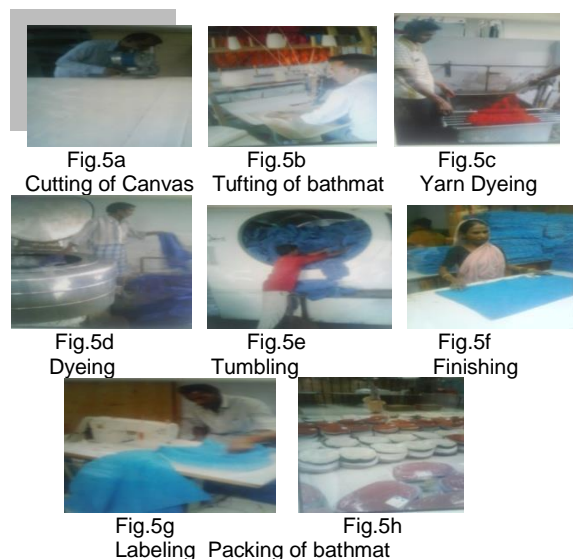


Fig.5a Cutting of Canvas
Fig.5b Tufting of bathmat
Fig.5c Yarn Dyeing
Fig.5d Dyeing
Fig.5e Tumbling
Fig.5f Finishing
Fig.5g Labeling
Fig.5h Packing of bathmat

Table 6: Type of motif used in rugs & bathmats

Motifs	Bathmats Units		Rugs Units	
	Frequency (n)	% age	Frequency (n)	% age
Geometrical Motif	70	70	80	80
Floral Motifs	10	10	5	5
Human Motifs	10	10	5	5
Animal Motifs	5	5	5	5
Other Type of Motifs	5	5	5	5

Fig.6: Types of Bathmats



Fig. 6a Shaggy bathmat
Fig.6b Bonded bathmat
Fig.6c Pile bathmat

Table 7: Criteria for selection of yarn for manufacturing

Quality	Bathmats Units		Rugs Units	
	Frequency (n)	% age	Frequency (n)	% age
Strength	30	30	40	40
Color Fastness	20	20	20	20
Yarn Number	10	10	10	10
All of above	40	40	30	30

Most of the units were using geometrical motifs while similar number of the units were using human and animal motifs and minimum number of the units of rugs and bathmat are using other type of motifs (Abstract type motifs). Usage of geometrical motifs was comparatively low.

Most of the unit selected the yarn according to their strength, color fastness, yarn number and some of the units were selecting the yarn according to their color fastness and owing to the lack of knowledge about the numbering system of yarns this criteria was least considered while selection of yarn for manufacturing of yarn...

Synthetic dyes were used in dyeing the rugs & bathmats. Dyeing was carried out in house by twenty percent of the total units while other eighty percent preferred job work for dyeing of yarns.

Source of Support: Nil

Conflict of interest: Nil

Acknowledgement: None

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Review Article

A review on relation between metabolic syndrome, general well being and yogic lifestyle.

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Abstract

The non-communicable diseases like coronary heart diseases, diabetes, cancer, respiratory illnesses, mental problems have spread across the world as global pandemic and India is no more exception. The metabolic syndrome is a cluster of syndrome which includes central obesity, hypertriglyceridemia, low HDL cholesterol, hyperglycemia and hypertension. Metabolic syndrome is associated with a 2-fold risk of CVD and a 5-fold risk of diabetes. Metabolic syndrome is often associated with other medical condition notably insulin resistance, fatty liver, cholesterol gallstones, obstructive sleep apnea, gout, depression, musculoskeletal disease, polycystic ovarian syndrome. Yoga the ancient vedic science was developed in India for improving spiritual health and wellbeing. In the recent times yoga is widely used to improve health and to prevent and cure disorders. Yoga helps us to improve physical strength, flexibility, balance, co-ordination and endurance. The majority of national and international studies had observed that yoga and meditation are effective in improvement of all the five characteristics of metabolic syndrome (central obesity, blood pressure, triglyceride level, glucose level and HDL level). A few international studies have observed that yogic intervention is effective for insulin resistance, fatty liver disease, health-related quality of life; stress and depressive symptoms.

Key words: Yoga and meditation, Metabolic syndrome, Insulin resistance, Stress, General well being

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Introduction

The noncommunicable diseases like coronary heart diseases, diabetes, cancer, respiratory illnesses, mental problems have spread across the world as global pandemic and India is no more exception. The lancet global health update 2018 has reported that cardiovascular diseases i.e. ischemic heart disease and stroke are responsible for highest mortality in India. The cardiovascular diseases alone contributed 28% mortality in India in 2016.¹ The non communicable diseases are increasing rapidly even in rural parts of India and it will have long term consequences to people health and finances in our country.

The changing lifestyle including lack of physical exercise, consumption of junk food and psychological stress is the main reason behind the rise of metabolic syndrome and other noncommunicable diseases. The other factors like age, genetics, ethnicity, migration and socioeconomic status etc also play important role in development of metabolic syndrome.

The metabolic syndrome is a cluster of syndrome which includes central obesity, hypertriglyceridemia, low HDL cholesterol, hyperglycemia and hypertension.² Metabolic syndrome is associated with a 2-fold risk of CVD and a 5-fold risk of diabetes. Cardiovascular Diseases represents the first leading cause and diabetes represents fourth or fifth leading cause of death in the world in men and women³ Metabolic syndrome is often associated with other medical condition notably fatty liver, cholesterol gallstones, obstructive sleep apnea, gout, depression, musculoskeletal disease, polycystic ovarian syndrome.⁴

The mechanism of Metabolic syndrome is resistance to insulin stimulated glucose uptake seems to modify biochemical responses in a way that predisposes to metabolic risk factor. A central role has been attributed to pro inflammatory cytokines, tumor necrosis factor and IL-6 supported by the fact that both are produced in substantial amounts by human adipose tissue. C-reactive protein levels have also been found to correlate with BMI and some features of the metabolic syndrome.

In addition to this, stress, whether related to depression,⁵ environmental stressors⁶, or perceived stress⁷, is associated with increased release of corticosteroids and other neurohormonal factors that may predispose to abdominal obesity, insulin resistance, atherosclerosis and stroke. Abnormalities in the neuroendocrine and autonomic responses typical of chronic stress appear to be a characteristic feature of the metabolic syndrome. (Figure 1)

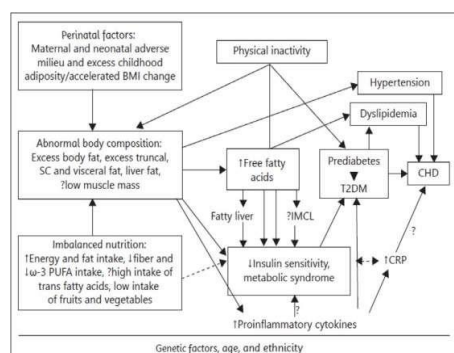


Fig 1 Complex interaction of genetic, perinatal, nutritional and other acquired factors in development of IR, T2DM and CHD in Asian Indians. CRP- C reactive protein, IMCL- intramyocellular lipids, SC-subcutaneous

Yoga, the ancient vedic science was developed in India for improving spiritual health and wellbeing⁸. The ancient Indian yogic lifestyle includes yogasana or specific posture, pranayama or controlled breathing, dhayana or meditation, consumption of sattvic food and complete restriction of tamasic food. In the recent times yoga is widely used to improve health and to prevent and cure disorders. Yoga helps us to improve physical strength, flexibility, balance, co-ordination and endurance⁹ and it can be used as a moderate intensity exercise for patients and it can be used as a moderate intensity exercise for patients with limited vital capacity or restricted ability to exercise¹⁰. Apart from these above-mentioned benefits, the yoga has further proved its usefulness to decrease hypertension and cardiac inflammation, and improve cardiac function, stabilize the sympathetic nervous system and improve psychological health¹¹⁻¹³. American College of Sports Medicine (ACSM) and Centre for Disease Control (CDC) suggest moderately intense physical activity for obese subjects¹⁴⁻¹⁵, because exercise training has been shown to improve metabolic risk factors in subjects with obesity. Practice of yoga increases muscle strength and cardio- respiratory fitness and has limited side effects. This is a cost effective training programme because it requires virtually no equipment.

Metabolic syndrome definitions

Various diagnostic criteria have been proposed by numerous national/international organizations for defining metabolic syndrome¹⁶⁻¹⁹. The Joint Interim Statement²⁰ of the International Diabetes Federation Task Force on Epidemiology and Prevention; National Heart, Lung, and Blood Institute; American Heart Association; World Heart Federation; International Atherosclerosis Society; and International Association for the Study of Obesity and also a Consensus Statement for Diagnosis of Obesity, Abdominal Obesity and the Metabolic Syndrome for Asian Indians.²¹ As per these consensus statements, three out of five cardiovascular risk factors have to be abnormal for the identification of the metabolic syndrome.^{20,21}

Presence of any three of the following five conditions is essential, i.e.

1. Increased waist circumference (males: ≥ 90 cm and for females: ≥ 80 cm)
2. Hypertriglyceridemia ≥ 150 mg/dl (1.7 mmol/l)
3. Low HDL (Males < 40 mg/dl (1 mmol/l) and for females < 50 mg/dl (1.3 mmol/l))
4. Elevated blood pressure (systolic blood pressure ≥ 130 mmHg and/or diastolic blood pressure ≥ 85 mmHg or drug treatment for hypertension)
5. Elevated blood sugar (fasting blood sugar ≥ 100 mg/dl (5.6 mmol/l) or drug treatment for diabetes mellitus.^{20,21})

It is estimated that 20-25% of adult world population is suffering from metabolic syndrome²². In United States, the prevalence of metabolic syndrome in adult population was estimated to be more than 25%. Similarly in 7 European countries, prevalence of metabolic syndrome was found to be 23%. It was estimated that 20%-25% of South Asians have developed Metabolic syndrome and many more may be prone to it^{23,24}. Epidemiologic studies conducted by Ramchandran A et al²⁵ in Indian population centers have estimated a prevalence of metabolic syndrome to encompass approximately one third of individuals residing in large cities. Kanjilalet al²⁶ have shown in their study that Asian Indian have a high predisposition to Metabolic syndrome and coronary artery disease. However on the basis of randomized study, Manchanda SC et al²⁷ demonstrated the reversal of atherosclerosis by practice of yogic lifestyle.

The phenotype of obesity and fat distribution is distinctive in South Asians and are important contributory factors for development of metabolic syndrome and diabetes mellitus. Enas et al (1992)²⁸ in coronary artery disease in India (CADI) study report the prevalence of diabetes is three to six times higher in south Asians than Americans, Europeans and other Asians. In India, it is estimated that 32 million people suffer from diabetes the number is projected to increase to 69.8 million by 2025.

Insulin resistance and metabolic syndrome

Insulin resistance is postulated to be the common underlying pathogenic link between the obesity and various components of the MS. Reasons for Insulin Resistance can be Genetic, Aging or ethnicity can also be a driving force of the disease but most important factors underlying for resistance are excess body weight, increase in waist circumference, little or no exercise in daily regime, sedentary lifestyle, smoking, and less sleep.²⁹ As insulin resistance and metabolic syndromes have high association with cancer of different types of tissues like bladder, colon, cervix, prostate, uterus etc.³⁰ The interlinking connection may be that high insulin levels early in insulin resistance seems to fuel the growth of various tumors and further suppresses the ability of our body to protect itself from malignant cells.³¹

Metabolic syndrome and Nonalcoholic Fatty liver Disease (NAFLD)

Nonalcoholic fatty liver disease (NAFLD) is a chronic metabolic disorder with significant impact on overall mortality³². Although the gastroenterologist's focus is mainly on its hepatic complications, patients with NAFLD have a risk of cardiovascular diseases highly exceeding the risk of liver-related deaths³³. NAFLD has been proposed as the hepatic manifestation of the metabolic syndrome, with insulin resistance (IR) as the common pathophysiological mechanism³⁴. The relationship between NAFLD and Metabolic syndrome is bidirectional. Liver fat content is significantly increased in subjects with Metabolic syndrome as compared with those without, independent of age, gender, and body mass index (BMI); in turn, the presence of NAFLD is a strong predictor of Metabolic syndrome, and markers of NAFLD are associated with the future risk of Type 2 diabetes and cardiovascular mortality, i.e. the worrisome outcomes of metabolic syndrome^{33,35}.

Metabolic syndrome, stress and general well being

The various factors play important role in causation of metabolic syndrome. The psychological stress has appeared as important risk factor of metabolic syndrome in present time. The work related stress; relationship related stresses are most important types of stress which results into progression of various components of metabolic syndrome. The stress-response is then initiated with activation of the hypothalamic–pituitary–adrenal (HPA) axis and the sympathetic–adrenomedullary (SAM) axis.³⁶ The activation of the two axes takes place in order to maintain the dynamic balance of the body, homeostasis, and is a necessary defense mechanism in situations of

acute stress. However, if stress persists then it reduces quality of life and causes mental illness like depression.³⁷

The best measure for quantifying the effect of chronic stress is so far by questionnaires (Qs). However, physiological changes from the activation of the HPA- and SAM-axes i.e. cortisol, noradrenalin level had been also used for measuring of stress.³⁸

Metabolic syndrome and yogic lifestyle

International status

M. Paul-Labrador et al (2006)³⁹ studied the effects of transcendental meditation on components of the metabolic syndrome in 103 subjects with coronary heart disease. Subjects (N = 103) were randomized to either a transcendental meditation or a health education program for 16 weeks. The study revealed the significant difference in systolic and arterial blood pressure in meditation group patients. The blood glucose and insulin levels were improved in meditation group. However, no difference in lipoproteins, hs-CRP, BMI and endothelial function using brachial artery reactivity test BART was observed in meditation group.

Cohen and colleagues (2008)⁴⁰ examined the effects of a restorative yoga intervention using a parallel study design. The yoga interventions were done for a period of 12 weeks in yoga group (n = 24). The control group received no intervention. Outcome measures included BMI, waist circumference, blood pressure, insulin sensitivity, plasma glucose, plasma insulin, triglycerides, HDL, LDL, demographic information, perceived stress (PSS), food frequency based dietary information, physical activity, quality of life (SF-36), depression (CES-D questionnaire) and a self-rating of overall health. Trends toward improved blood pressure (P = .07), well-being (P < .12), and stress (P < .22) were observed, as well as non-significant changes in weight and BMI in the yoga group.

Liu X et al (2010)⁴¹ conducted a single group pre-post feasibility trial for Tai Chi and Qigong exercise training. The feasibility trial was conducted with 11 participants for 12 weeks. The main outcome measures were Indicators of metabolic syndrome (body mass index (BMI), waist circumference, blood pressure, fasting blood glucose, triglycerides, HDL-cholesterol); glucose control (HbA1c, fasting insulin and insulin resistance (HOMA)); health-related quality of life; stress and depressive symptoms. There was good adherence and high acceptability. There were significant improvements in various indicators of metabolic syndrome including BMI, waist circumference, blood pressure, as well as in

HbA1c, insulin resistance, stress, depressive symptoms. SF-36 mental health summary score and subscales for general health, mental health and vitality were also improved.

Stephanie J sohl (2016)⁴² et al c conducted a randomized control trial pilot study to observe the effect of yoga and health education in comparison to health education alone in metabolic syndrome. The study also aimed to examine perceived stress, quality of life in study subjects. The Sixty-seven adults at risk for Metabolic syndrome were enrolled in study. Preliminary results revealed significantly larger improvements in two quality of life domains (role-physical and general health perceptions) in the HED plus yoga group versus HED alone.

National status

Bijlani et al (2005)⁴³ enrolled 98 subjects, 67 males and 31 females, age 20- 74 years; all had hypertension, diabetes and CHD. They found that the practice of yogasanas (postures), pranayama (breathing), relaxation techniques, group support, meditation, stress management, knowledge of nutrition] lowered blood pressure, fasting plasma glucose and serum lipoproteins with the first session of yoga practice. The study showed the significant improvement in plasma levels of fasting glucose, total- and LDL-cholesterol, triglycerides, and HDL-cholesterol.

Khatri et al (2007)⁴⁴ randomized 101 subjects into usual care and usual care plus yoga group for 12 weeks. The study showed that there was a significant improvement in waist circumference, blood pressure, blood glucose, HbA1c, triglycerides, and HDL-C in yoga group.

Manchanda SC et al (2013)²⁷ conducted a study to determine whether yoga can regress early atherosclerosis in patients with MetS. The carotid intima thickness (cIMT) was measures to determine reversal of atherosclerosis in yoga group. The study was randomized control trial with sample size of 100. 81% patients completed the study. At the end of 1 year, the yoga group showed a significant regression of cIMT (0.842 ± 0.176 to 0.808 ± 0.204 , $p < 0.001$) whereas there was no significant change in cIMT in the control group (0.831 ± 0.171 to 0.834 ± 0.131 , $p = \text{NS}$). In addition the yoga group also showed greater reduction in Body Mass Index (BMI), Waist Circumference (WC), LDL cholesterol and Systolic Blood Pressure (SBP).

Tapan Das et al (2015)⁴⁵ conducted a 3 arm study to find effect of yoga on metabolic syndrome. Total 135 subjects within the age group 15-65yrs were recruited in this study for a period of 6 months. After 6 months study result showed

statistically and clinically significant results. The body weight ($p < 0.01$), BMI ($p < 0.1$), Waist circumference ($p < 0.01$), systolic blood pressure ($p < 0.01$), fasting blood sugar ($p < 0.05$) significantly decreased in Yoga with diet group in comparison to control as well as only yoga group. Only yoga group also shows improvement in comparison to control group. No significant changes were observed between or within all groups for triglycerides and HDL.

Conclusion

Asian Indian has a high predisposition to Metabolic syndrome and coronary artery disease. It is estimated that 20%–25% of South Asians have developed metabolic syndrome and many more may be prone to it The changing lifestyle including lack of physical exercise, consumption of junk food and psychological stress is the main reason behind the rise of metabolic syndrome . The other factors like age, genetics, ethnicity, migration and socioeconomic status etc also play important role in development of metabolic syndrome.

Metabolic syndrome is often associated with other medical condition notably fatty liver, cholesterol gallstones, obstructive sleep apnea, gout, depression, musculoskeletal disease, polycystic ovarian syndrome. Metabolic syndromes and insulin resistance have also high association with cancer of different types of tissues like bladder, colon, cervix, prostate, uterus etc.

Various research studies show that yogic lifestyle is very effective in prevention and management of metabolic syndrome. The majority of national and international studies had observed that yoga and meditation are effective in improvement of all the five characteristics of metabolic syndrome (central obesity, blood pressure, triglyceride level, glucose level and HDL level. A few international studies have observed that yogic intervention is effective for insulin resistance, fatty liver disease, health-related quality of life; stress and depressive symptoms. Therefore, more research are needed to study the effect of yogic interventions on these parameters

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Review Article

Negative marking system with special reference to S. Nelson Prabhakar v. CBSE

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Abstract

Evaluation is important part of the any examination system. The system of evaluation must be fair, just, reasonable and transparent. It is necessary to ensure confidence and faith of the students and public at large in the examination system. In present, the competitive exams are highly required and same time their proper evaluation is also required. The main purpose of the examinations and evaluation is to access the knowledge and ability of the candidates.

Key Words: Negative Marking System, examination, intuition, fear, and guessing.

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Introduction:

The negative marking system is an evaluation system followed by different agencies in the competitive examination conducted by them. Negative marking schemes are designed to discourage guessing. In negative marking system, correct answers are rewarded, wrong answers are penalised while unanswered questions are neither rewarded nor penalised. Unanswered questions are awarded zero. General perception of the different classes of the society is that the negative marking system is helpful in making meritorious selection.

Probability to mark correct answers

If each question has four answer options, then the expected score for a test taker who has zero knowledge, comprehension, or aptitude will be 25%. A test taker who knows the answers to 20% of the questions has an expected score of 40%, since on average they will guess the right answers to a quarter of the remaining 80% of the questions.

Example: Consider a collection of 50 questions, 3 marks per question. Total marks 150. Suppose that a particular test taker knows the right answer to the 10 questions. He makes random guesses for the remaining 40 questions. If each question is worth 3 marks, the test taker will get 30 marks for the first 10 questions.

If he makes random guesses for the remaining 40 questions then on average he can mark 10 questions correctly out of 40 questions and he will get another 30 marks. He knows answer of 10 questions. It means he will get $10 \times 3 = 30$ marks for the first question. Now, he makes random guesses for remaining 40 questions and hence there is a probability to mark another 10 questions correctly. If it happens, he will get another $10 \times 3 =$

30 marks. Therefore, in aggregate he can obtain total 60 out of 150 marks. It is 40%.

There are two types of questions, in which negative marking system is not applicable.

- **Integer type:** Students have to "calculate" down to the finest value and then indicate that value in the OMR sheet.
- **Match the following:** The students are asked to match the items in the left column with those in the right column.

Significance of the Study

The very crucial issue of negative marking system is related to the future of millions and millions of students of this country. They must be provided a just and fair opportunity to participate in competitive examinations. The pattern, mode and procedure for conducting of competitive examination must be also fair, reasonable, proper and justifiable.

Objectives of study

The main objectives of study are as follows-

- To know the concept and applicability of the negative marking system.
- To find out advantages and disadvantages of the negative marking system.
- To discuss the appropriateness of the negative marking system.
- To analyse the impact of the negative marking system upon the students.
- To discuss the implication of law with the negative marking system.

Hypothesis

- It is unjust and unfair.
- It does not stand to test of law.
- It creates fear in the mind of students.

Aims & objectives of the negative marking system

The main objectives of negative marking system are as follows¹.

- To discourage guessing.
- To ensure that only diligent and deserving candidates get selected.
- Reward ability not luck.
- Encourage students to study.

Advantages of the negative marking system

The main advantages are as follows¹:

- It yields scores that are not inflated by guesswork.
- It discourages random guesses, and therefore it increases reliability and validity of the test.

Disadvantages of negative marking system

The main disadvantages are as follows²:

- It does not allow a student to develop an element of intelligent guessing. Intelligent guessing is different from wild guessing.
- It attempts to crush the bud of imagination.
- The performance on one item influences the other.
- It cripples the intuition of a student.
- It creates an element of fear in the mind of students.
- It doesn't help student to think rationally.
- It assumes that every wrong answer is a guess.
- It is concerned about risk taking attitude which is unrelated to skill or knowledge level of students.
- A student has to be confident but having knowledge of each and every answer cannot be expected from the students.
- There is no scientific proof in support that it helps to choose best candidate from examination.
- It does not help anyway to examiner to analyze the intelligence, aptitude, or knowledge of students.
- Not losing marks, rather than scoring marks, becomes top priority for a student, which is a wrong approach.
- The whole purpose of multiple choice questions gets defeated.
- Already students are under a lot of stress while appearing for competitive exams.

Discussion

The Madras High Court disposing the case filed under Article 226 of the Constitution of India observed that the negative marking system required to be changed in competitive examination because it does not play any for developing the brain of student³. It prevents the students from making intelligent guessing. This system does not help

anyway to examiner to analyse the intelligence, aptitude or the knowledge of the students.

Facts of the case

The petitioner S Nelson Prabhakar had appeared for the JEE (Main) examination under the SC category in 2013. He couldn't crack it due to a shortage of three marks because of the negative marking system. The petitioner filed writ petition under Article 226 praying for a writ of Mandamus seeking direction to the CBSE to re-evaluate his physics and mathematics answer sheets and publish the marks⁴.

Petitioner claimed that he performed well in entrance examination and he expected to score above 40 marks in Physics and above 50 in Mathematics. Upon seeing the result he shocked because he was awarded only 5 marks in Physics, 42 marks in Chemistry and 0 marks in mathematics. When the matter was taken up for consideration, the court directed to the respondent to produce the answer script of the petitioner. In the said examination, the respondent followed the system of negative marks for wrong answers. In mathematics, petitioner answered 3 questions correctly and given wrong answers for 12 questions. Total score of mathematics was 0. In physics correct answers were 3. Wrong answers were 7 and total score is 5. In Chemistry correct answers were 12. Wrong answers were 6 and total score was 42. There were four marks for every right answer and one negative mark for every wrong answer. Petitioner answered 18 questions correctly and given wrong answers for 25 questions. Total score of petitioner was 47. Since cut off marks was 50, the petitioner did not qualify to appear for JEE Advance Level Examination. Hence, he approached to the court with present writ petition.

The learned counsel for petitioner argued that awarding negative marks to the students in competitive examinations taken at the age of 17 is very tyrannical for them. It cannot be presumed that all the wrong answers are the result of guessing. It is time for judicious scrutiny of negative marking system. It is submitted that most advanced countries such as UK, Canada, Australia and Russia do not follow the negative marking system. The learned counsel for the respondent argued that the purpose of negative marking system is to test the competency of the students. If there is no negative marking, the students try to attend all questions without having sound knowledge of the subject. The main object of the negative marking is to ensure that only diligent and deserving candidates get selected for admission.

The judge of the Madras High Court said that the study material of many countries will support that negative marking does not help a student think rationally. In other words, negative marking does not allow a student to develop an element of guessing. Intelligent guessing is an art. An individual will come across a situation, where he or she has to decide an issue not merely based on his knowledge, but with a little guessing. He also said that the students come with preparations of various degrees and when they are not sure of an answer, they go for intelligent guessing. This type intelligent guessing should be permitted and

encouraged as it would help the students in future, but the negative marking system completely eradicates the habit of intelligent guessing from the students⁴.

The court has made some observations as follows⁵:

Intelligent guessing should be permitted and encouraged

Negative marking does not allow a student to develop an element of guessing. Intelligent guessing is an art. It is very useful in our life. One cannot be sure about all things at all times. An individual will come across a situation, where he has to decide an issue not merely based on his knowledge, but with little guessing. Intelligent guessing requires an amount of prior knowledge on the subject. Wild guessing is another type of guessing.

It Attempts to Crush the Bud of Imagination

Albert Einstein stated, "Imagination is more important than knowledge". When knowledge denotes accumulation of proven facts, imagination explores the areas of disproving the existing belief and paving paths to new world. Imagination is the mother of all inventions and discoveries. Without imagination, there is no creativity. The urge to create something new or develop something new, comes from imagination. In short, imagination is the seed for all the man made developments, on this planet. The threat of negative marking attempts to crush the bud of imagination. Success and failures are like two sides of the same coin. Therefore, a student should be taught to face mistakes and failures and see it a part of life.

The Intuition of a Student is Crippled

By awarding negative marks, the intuition of a student is crippled. Everyone comes across a situation in life where decisions are taken purely out of intuition. It may work or may not, but, an element of boldness comes along, while making a decision through intuition. The threat of negative marks will never allow intuition to grow in a student.

There should be a level playing field

Students, who take part in competitive examinations, come from different strata of society. Those hailing from affluent families can afford to take private coaching and enhance their knowledge and techniques and the same cannot be expected from meritorious students coming from economically weaker background. There has to be a level playing field in examination in general, especially in competitive examination.

Student Approaches every Question with an Element of Fear

Negative marking acts a weight behind the mental strength of a student and the student approaches every question with an element of fear. He has to be doubly cautious, while choosing the answer for the question. In other words, a student has to be confident about the answer. Such confidence of knowing each and every answer cannot be expected from the students, meritorious or otherwise.

If there is no negative mark, the students are given an opportunity to take a wide thinking and apply intelligent guessing. This practice of taking an intelligent guess indeed develops the brain of a student and builds his confidence to tackle any situation in future.

Conclusion

The study found that the negative marking system is unfair and unjust. It does not provide a level playing field to the student of strata of society. It does not help to examiner in any way to access the knowledge and aptitude of the student. It creates fear in the mind of students. Our education system at higher as well as middle does not follow this system. After getting education at middle or university level, the students have to face this problem in competitive examination. There should be parity between both systems. Therefore, this system should be abolished. To increase reliability and validity of the test the standard of the question should be raised.

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Conflict of interest: Nil

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Original Study

A Descriptive Study To Assess The Health Related Quality Of Life In Terms Of Knowledge And Attitude Among Patients With Thalassemia Attending OPD In Selected Hospitals At Meerut With A View To Develop Information Booklet

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ABSTRACT:

Objectives: (1) To assess the health related quality of life among patients with thalassemia. (2) To assess the level of knowledge and attitude regarding health related quality of life among patients with thalassemia. (3) To find out the association between knowledge and attitude scores regarding health related quality of life among thalassemia patients with their selected demographic variables. (4) To develop and validate information booklet regarding health related quality of life for thalassemia patients. **Research design** for this study is descriptive research design. The Target population was Thalassemia patient at hospital. **Result:** Result revealed that samples, 8(26.66%) of them were having adequate knowledge and 22(73.33%) were having inadequate knowledge regarding Knowledge on Thalassemia. Majority of them, 20(67%) were having Less Favourable Attitude 10(33%) of them were having Unfavourable Attitude and (0%) none of them were having Favourable Attitude. **Conclusion:** Information booklet was prepared based on the findings of the study which is intended to improve the knowledge and attitude.

Keywords: Quality of life, Knowledge, Attitude, Thalassemia, Information booklet

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Introduction

"Access to Safe & Effective Drugs in Thalassemia" - Theme for International Thalassemia Day 2016

Blood is a specialized body fluid that delivers necessary substances to the body's cells such as nutrients and oxygen and transports waste products away from those same cells. Blood is a bodily fluid in humans and other animals that delivers necessary substances such as nutrients and oxygen to the cells and transports metabolic waste products away from those same cells.

Thalassemias are inherited disorder characterized by abnormal hemoglobin production. Symptoms depend on the type and can vary from none to severe. Often there is mild to severe anemia (low red blood cells). Anemia can result in feeling tired and pale skin. There may also be bone problems, an enlarged spleen, yellowish skin, dark urine, and among children slow growth. Two main types are, alpha thalassemia and beta thalassemia. The severity of alpha and beta thalassemia depends on how many of the four genes for alpha globin or two genes for beta globin are missing.

NEED FOR THE STUDY

Thalassemia affects approximately 4.4 of every 10,000 live births throughout the world. It causes males and females to inherit the relevant gene mutations equally because it follows an autosomal pattern of inheritance with no preference for gender. Approximately 5% of the worldwide population has a variation in the alpha or beta part of the hemoglobin molecule, although not all of these are symptomatic and some are known as silent carriers. In fact, only 1.7% of the global population has signs as a result of the gene mutations, known as a thalassemia trait. However, particular ethnic groups are more likely to be affected and 5-30% of the population may be symptomatic among these groups. (YolandaSmith, 2015)

As of 2013, thalassemia occurs in about 280 million people, with about 439,000 having severe disease. It is most common among people of Italian, Greek, MiddleEastern, SouthAsian, and African descent. Males and females have similar rates of disease. It resulted in 16,800 deaths in 2015, down from 36,000 deaths in 1990. Those who have minor degrees of thalassemia, similar to those with sickle-cell trait, have some protection against malaria, explaining why they are more common in regions of the world where malaria exists.

Schematic Presentaion Of The Research Design

Semi-structured questionnaire schedule and rating scale for assessing knowledge and attitude of thalassemia patients attending the hospital.



Information booklet was distributed to the samples which have been prepared by researcher based on the assessing knowledge and attitude and which can improve their quality of life



Information's regarding the attitude the quality of life on the basis of four domain were collected from thalassemia patients attend in hospital at Meerut by using a modified short form health survey (SF-36 Questionnaire)

Variables

Dependent variable: The dependent variable is the condition or characteristics that appears or disappear as a result of independent variable. In the present study the dependent variable is knowledge and attitude of the Thalassemia patient.

Extraneous Variables:

Demographic variables such as age, Gender, educational, occupation, religion, family income, Duration of illness, Birth order, Source of Health information.

Setting Of The Study

The study was conducted in selected hospitals at Meerut (Chathrapati Shivaji Subharti Hospital, Lokpriya Hospital).

Target Population

The Target populations was Thalassemia patient at hospital.

Sample And Sampling Techniques

Non - probability purposive sampling technique has been used in this study

Sample Size: In the study, sample size was 30 Thalassemia patients attending OPD's in selected Hospitals of Meerut.

Criteria For Sample Selection

Inclusion Criteria

- Thalassemia patients who are attending OPD's in selected Hospitals of Meerut

- Thalassemia patients aged between 10-18 yrs
- Both male and female Thalassemia patients
- Thalassemia Patients who are willing to participate in the study.
- Thalassemia Patients who can understand, read, write in Hindi or English.

Exclusion Criteria

- Thalassemia patients aged below 10 yrs and above 18 yrs
- Thalassemia Patients who are not willing to participate in the study.
- Thalassemia Patients who cannot understand, read, write in Hindi or English.

Tools And Methods Of Data Collection

Description and Development of Tool

Tool consists of a structured knowledge questionnaire on health related quality of life. The tool is based on the extensive literature review and consists of Tool-I Tool-II Tool-III Tool-IV Following steps were involved in the development of tools-

- Review of research and non- research literature and opinion of experts.
- Preparing blue print for structured knowledge questionnaire schedule.
- Development structured knowledge questionnaire schedule and attitude scale.
- Establishing scoring of tools.
- Assessing items for content validity.
- Tryout of tools.
- Estimation of reliability, item analysis and discrimination value.

Development Of Information Booklet

An Information booklet is developed regarding Thalassemia among Patient after extensive study of literature and discussion with experts. The content of Information booklet was developed under the following headings:

- Section –A (General aspects of Thalassemia)
- Section – B (Importance of Thalassemia)
- Section – C (Type of Thalassemia)
- Section-D (Advantage and disadvantage of Thalassemia)
- Section – E (Myths of Thalassemia)

Data Collection Procedure

Formal administrative permission was obtained from Respective Higher authority from the college and hospital, Data was collected from 13.03.17 to 22.04.17

- Self-introduction was given.
- Introduction to the nature of study was given to obtain free and frank response.
- Purposive sampling technique was used to selected 30 Thalassemia patient.
- Confidentiality of their responses was assured and consent was taken.

- On the Day-one-test was done by administering structured knowledge
- Questionnaire and attitude scale and SF-36 for assessing the quality of life.
- After test information booklet was given to the group.

The data analysis was done by using descriptive and inferential statistics.

Result Analysis

- Among 30 thalassemia 3 (10%) of them were in between the age group of 0 -5 years, 10 (33%) of them were of 6 -10 yrs. 3 (10%) of them were in between 11 - 15yrs and 14 (46.6%) of them were belongs the age above 16 years.
- Out of 30 samples, 19 (63.3%) samples were male and 11 (36.6%) were Female.
- Education showed that out of 30 samples, 4 (13.3%) of them were having non formal education, 11 (36.6 %) of them were having primary education, 6 (20%) of them were having secondary education, and 9 (30%) of them were having graduate.
- Occupation showed that out of 30 samples, 8 (26.6%) of them were doing daily wages, 4 (13.3%) of them were having self employed, 7 (23.3%) of them were having business and, 11 (36.6%) of them were having other work.
- Out of 30 samples, 13 (43.3%) of them earning 50,000 th. In a year, 5 (16.6%) of them are earning 10,0000, and, 12 (40%) of them are earning more than 10,0000.
- In duration of illness out of 30 sample, 14 (46.6%) are having less than one year, 4 (13.3%) were 1 – 3 yrs, 3 (10%) were 3 – 5 yrs and 9 (30%) are more than 5 years.
- In birth order out of 30 samples, 17 (56.6%) were is first, 9 (30%) out of them were are second and third and 4 (13.3%) are fourth and more.

Result revealed that samples, 8(26.66%) of them were having adequate knowledge and 22(73.33%) were having inadequate knowledge regarding Knowledge on Thalassemia.

Majority of them, 20(67%) were having Less Favourable Attitude 10(33%) of them were having Unfavourable Attitude and (0%)none of them were having Favourable Attitude .

Analysis of association between quality of life of thalassemia patients with their selected demographic variables.

Quality Of Life Score	Frequency	%age
Poor Quality Of Life (>45%)	3	10%
Moderate Quality Of Life(46-60%)	15	50%
Good Quality Of Life (60-100%)	12	40%

Mean And Standard Deviation Regarding Scores Of Quality Of Life Of Thalassemia Patient In Eight Dimension. (Physical Functioning Role Limitation Due To Physical Health, Role Limitation Due To Emotional Health, Energy\ Fatigue, Emotional Well Being, Social Functioning, Pain, General Health.

S.N	Eight Dimension Of Quality Of Life	Mean	Standard Deviation
1	Physical Functioning	50	18.0
2	Role Limitation Due To Physical Health	60	26.54
3	Role Limitation Due To Emotion Health	64.44	24.65
4	Energy/ Fatigue	53.14	17.0
5	Emotional Well Being	55.5	13.5
6	Social Function	72.46	22.2
7	Pain	64.83	S2.03
8	General Health	57.62	12.6

There was no significant difference between knowledge and the knowledge scores regarding health related quality of life of thalassemia patient with their selected demographic variables.

DISCUSSION:

- ❖ **Regarding Knowledge:** These study findings revealed that majority of the thalassemia patients, Among 30 samples, 22 in 73.33%.were having inadequate knowledge regarding thalassemia.

John R, Kilton Rose at al (2012) a research study was conducted for quality of life A cross-sectional correlational survey design and purposive sampling were used. Thirty-two thalassemia major patients (mean age 17.5 years) and 32 mothers (mean age 40.5 years) were recruited. On a scale ranging from 0-20, the average of the patients' disease knowledge about thalassemia major was 15.19 and the average of their mothers' disease knowledge was 16.44. The scores for the patients' disease knowledge about thalassemia major were positively correlated with follow-up visit adherence ($r = 0.690$, $p < 0.001$) and with desferrioxamine infusion adherence ($r = 0.791$, $p < 0.001$). 95.6% of variance in patients' knowledge was explained by a model that included mothers' knowledge ($\beta = 0.901$, $p < 0.001$), follow-up visit adherence ($\beta = 0.084$, $p = 0.140$) and annual household income ($\beta = 0.042$, $p < 0.387$). This supportive study findings revealed that the thalassemia patients were having average knowledge and it was positively correlated with follow up Visit adherence.

This present study findings showed that majority of them were having inadequate knowledge which affects their quality of life. So proper information has to be provided to the sample which can help them to improve their quality of life.

Demographic Variables	Categories Knowledge score	AM	BM	CAL.V	P<0.05 LEVEL	D F	Table value	Significant / Not Significant
Age group	0-5 year	3	-	2.265	0.5193	3	7.82	NS*
	6-10 year	6	4					
	11-15 year	2	1					
	Above 16 year	11	3					
Gender	Male	14	5	0.003,	0.9946	1	3.84	NS
	Female	8	3					
Education	Non formal education	2	2	3.502 ,	0.3205	3	7.82	NS*
	Primary	8	3					
	Secondary	6	-					
	Graduate	6	3					
Occupation	Daily wages	6	2	2.406,	0.4925	3	7.82	NS*
	Self employed	4	-					
	Business	4	3					
	Others	8	3					
Religion	Hindu	18	6	1.023,	0.7958	3,	7.82	NS*
	Muslim	2	1					
	Christian	1	-					
	Sikh & other	1	1					
Family Income	50,000	11	3	0.839,	0.6574	2	5.82	NS*
	10,0000	4	1					
	Above 10,0000	7	4					
Duration Of illness	Less one year	9	5	5.609,	0.1323	3	7.82	NS*
	1 – 3 years	4	-					
	3 – 5 years	1	2-					
	Above 5 year s	-	-					
Birth other	First	8	1	1.725,	0.6315	3	7.82	NS*
	Second &	12	5					
	Third	6	3					
	Fourth or more	-	-					
Knowledge regarding Thalassemia	Yes	2	-	1.493,	0.2217	1	3.84	NS*

Chi square test to determine the association between the selected demographic variables and the knowledge scores regarding health related quality of life of thalassemia patient. (n=30). There was no significant between knowledge and the knowledge scores regarding health related quality of life of thalassemia patient with their selected demographic variables.

❖ **Regarding quality of life:** This present study, revealed that Majority of them 15 (50%) were having moderate quality of life 12(40%) of them were having good quality of life and 3(10%) of them were having poor quality of life.

The present study revealed that for mean value of physical function was 50, role limitations due to physical health 60, Body pain 64.83, energy, Fatigues 53.14, general health 57.62, social function 72.46, role

limitations due psychological reasons (emotional) 64.4 and mental health 60

Amani F et al (2015) conducted a study Quality of life among Ardabil patients with beta-thalassemia major at Iran. Thalassemia as the most common genetic disorder worldwide is regarded as a serious problem in public health issues in the Mediterranean region. Patients with beta-thalassemia major experience physical, psychological and social problems that lead to decreased quality of life.

DEMOGRAPHIC VARIABLES	Categories Attitude score	AM	BM	CAL.V	P<0.05 LEVEL	DF	table value	SIGNIFICANT NOT SIGNIFICANT
Age group	0-5 year	3	-	6.199,	0.1023	3	7.82	NS
	6-10 year	6	4					
	11-15 year	1	2					
	Above 16 year	4	10					
Gender	Male	9	10	0.010,	0.9289	1	3.84	NS
	Female	5	6					
Education	Non formal education	3	1	5.152,	0.1610	3	7.82	NS
	Primary	7	4					
	Secondary	2	4					
	Graduate	2	7					
Occupation	Daily wages	4	4	3.297	0.3481	3	7.82	NS
	Self employed	3	1					
	Business	4	3					
	Others	3	8					
Religion	Hindu	11	13	6.060,	0.1087	3,	7.82	NS
	Muslim	3	-					
	Christian	-	1					
	Sikh & other	-	2					
Family Income	50,000	10	4	6.540,	0.0380	2	5.99	S*
	10,000	1	4					
	Above 10,000	3	8					
Duration Of illness	Less one year	9	5	5.032	0.1695	3	7.82	NS
	1 – 3 years	2	2					
	3 – 5 years	-	3					
	Above 5 years	3	6					
Birth other	First	8	9	2.046,	0.5630	3	7.82	NS
	Second &	5	4					
	Third	1	1					
	Fourth or more	-	2					
Knowledge regarding Thalassemia	Yes	6	11	2.039	0.1533	1	3.84	NS

Chi square test to determine the association between the selected demographic variables and the Attitude scores regarding health related quality of life of thalassemia patient. (n=30) There was a significant association between the Attitude scores regarding health related quality of life of thalassemia patient and family income.

The aim of this study was to assess health-related quality of life and its determinants among patients with major beta-thalassemia. **Methods:** This was a population-based cross-sectional survey of quality of life. Population with thalassemia major (aged ≥ 2 years) of both genders who had records in Thalassemia Clinic of Bu-Ali Hospital, and those who regularly refer for blood transfusion or follow-up visits. Data were collected from December 2013 to May 2014. The self-administered short form-36 (SF-36)

questionnaire was used to measure quality of life in patients with thalassemia. Data were analysed using descriptive statistical tests (mean, SD, and frequency), and inferential statistical test (t-test) in SPSS.17 software. **Results:** Our samples were 20 men and 23 women. The median age was 20 years (2-42). After reviewing the patients' quality of life, it was observed that the mean score for physical function was 79.8, role limitations due to physical reasons 78.8, bodily pain 74.4, general health 59.1, fatigue or vitality

63.3, social function 70.21, role limitations due to psychological reasons (emotional) 77.3 and mental health 65.4. On two scales, role physical ($P = 0.33$) and role emotional ($P = 0.13$), the men showed significantly lower scores than the women.

Conclusion & Summary:

After analysis of the result, information booklet was prepared and distributed, which was intended to improve the knowledge and attitude of thalassemia patients.

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Review Article

Socio- Legal Issues of Surrogacy : An advanced assisted reproductive techniques (ART)

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Abstract:

Surrogacy arrangement has emerged as an answer to those childless couples who have a strong desire to have a child of their own but do not desire to adopt one . A surrogate mother is a woman who carries a child for another couple that is composed of her own egg and the sperm of the intended father or a sperm donor. The ever-rising prevalence of infertility world over has led to advancement of assisted reproductive techniques (ART). Herein, surrogacy comes as an alternative when either of the infertile partner or both of them are not able to reproduce. Although this arrangement appears to be beneficial for all parties concerned, there are certain delicate issues which need to be addressed through carefully framed laws in order to protect the rights of the surrogate mother and the intended parents.

Keywords: Surrogacy, IVF, Social, Legal issue, Ethics

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Introduction

Society is named for the group of individuals, at one point this may be geological and at another they may be zoological or botanical. One salient feature of this so called society may be considered as reproduction in terms of genetics. The importance of reproduction in human beings is relied on men and women, their fertility to produce children to carry on the family line, as life exists because of procreation.

To celebrate this power of procreation many religions practice fertility rituals. During these fertility rituals, the power of procreation is honored by worshipping fertility Gods. But the destruction, deviation or extinction of this special feature of fertility is considered as a curse for the individual and for the entire family. Ideally, creature has empowered all living beings with the power of production or reproduction. But because of known and unknown natural and scientific effects, this special feature can be found in a vegetative stage and the requirement is to get the solution of the problem specifically for human beings. Reproductive problems are not new rather common in all. Some are curable and some cannot be cured and this state of human existence is considered pathetic since long. Sometime men are found with reproductive problems and sometime women.

Therefore, surrogacy arrangement has emerged as an answer to those childless couples who have a strong desire to have a child of their own but do not desire to adopt one. 'Surrogacy' here means an arrangement which provides solution or remedy if one or both of the partners are having reproductive problems. In surrogacy a woman carries and delivers a child for another couple or person. This woman, i.e., the surrogate mother, may be the child's genetic mother (through adoption of traditional surrogacy), or she may be genetically unrelated to the child (through adoption of gestational surrogacy). If the surrogate receives compensation beyond the reimbursement of medical and other reasonable expenses, the arrangement is called commercial surrogacy; otherwise, it is often referred to as altruistic surrogacy.¹

Surrogate motherhood is a new development in the management of infertility. It assists infertile couple to procreate children by different techniques. The advantage is that a woman without a uterus but with functioning ovaries may have her child with the help of a surrogate mother. Traditionally, the surrogate mother was usually a close relative who was looked after and taken care of as there was no financial obligation involved in the process. However, with the times changing and relatives not readily available to suffer the discomfort and pain involved, the services

of surrogate mothers have assumed pecuniary overtones. The problem of infertility is a serious one in our society and the social stigma involved includes abandoning of wives. Surrogacy is being resorted to widely as a solution to infertility because one or both of the partners may suffer from infertility problems.

Types of Surrogacy: -

There are six types of surrogacy arrangements available for intended parents: -

1. Gestational Surrogacy (GS): When the intended mother is not able to carry a baby to term (due to hysterectomy, diabetes, cancer, etc.) her egg and the intended father's sperm are used to create an embryo (via IVF) that is transferred into and carried by the surrogate mother. With this method, the child born is genetically related to its parents and the surrogate mother has no genetic relation.

2. Gestational Surrogacy & Egg Donation (GS/ED): If there is no intended mother or the intended mother is unable to produce eggs, the surrogate mother carries the embryo developed from a donor egg that has been fertilized by sperm from the intended father. With this method, the child born is genetically related to the intended father and the surrogate mother has no genetic relation.

3. Gestational Surrogacy & Donor Sperm (GS/DS): If there is no intended father or the intended father is unable to produce sperm, the surrogate mother carries an embryo developed from the intended mother's egg (who is unable to carry a pregnancy herself) and donor sperm. With this method, the child born is genetically related to the intended mother and the surrogate mother has no genetic relation.

4. Gestational Surrogacy & Donor Embryo (GS/DE): When the intended parents are unable to produce sperm, egg, or embryo, the surrogate mother can carry a donated embryo (often from other couples who have completed IVF that have leftover embryos). With this method, the child born is not genetically related to the intended parents and the surrogate mother also has no genetic relation.

5. Traditional Surrogacy (TS): In a traditional surrogacy, the child may be conceived via artificial insemination using fresh or frozen sperm or impregnated via IUI (intrauterine insemination), or ICI (intracervical insemination) performed at a health clinic. A gestational surrogacy requires the transfer of a previously created embryo, and for this reason the process always takes place in an ART clinic. The intended parent(s), sometimes called the social parents, may arrange a surrogate pregnancy because

of partner infertility, other medical issues which make pregnancy or delivery impossible, risky or otherwise undesirable. The sperm or eggs may be provided by the 'commissioning' parents or donor sperm, eggs and embryos may also be used.

6. Traditional Surrogacy & Donor Sperm (TS/DS):

This involves artificially inseminating a surrogate mother with donor sperm via IUI, IVF or insemination. With this method, the child born is genetically related to sperm donor and the surrogate mother.

Social Issues regarding Assisted Reproductive Techniques: -

The term 'surrogacy' through the meaning of Black's Law Dictionary explains that the word 'surrogate' has its origin in the Latin word 'surrogates', meaning a substitution or replacement, i.e., a person appointed to act in the place of another.² Surrogacy is an 'arrangement' in which a woman agrees to a pregnancy, achieved through assisted reproductive technology, in which neither of the gametes belong to her or her husband, with the intention of carrying it to term and handing over the child to the person(s) for whom she is acting as surrogate. The surrogate is a woman who agrees to have an embryo generated from the sperm of a man who is not her husband, and the oocyte for another woman implanted in her womb to carry the pregnancy to full term and deliver the child to its biological parent(s). In medical parlance, the term 'surrogacy' means using of a substitute mother in the place of the natural mother. The surrogate mother bears a child on behalf of another woman, either from her own egg or from the implantation in her womb of a fertilized egg from another woman and then she assigns her parental rights to the commissioning parents.

Today surrogacy has become one of the mainstream options for childless couples across the world. Such couples resort to surrogacy because there are medical conditions that prevent natural childbirth. Such conditions include infertility, a danger of the pregnancy harming the woman or the child etc. The infertile couples who are not able to conceive a child of their own take the help of reproductive technologies like artificial insemination, in-vitro fertilization/test-tube baby and surrogacy, which have become a ray of hope for these couples. These reproductive technologies are treated as a remedy for many problems and offer a wide range of choices. This surrogacy arrangement is made between a couple (where either of whom is infertile) and a surrogate mother. In such an arrangement, the surrogate mother agrees to be artificially inseminated with the male sperm, to bear a child and to give up all her parental rights and to transfer physical custody of the child to the commissioning couple on the birth of the child. Thus, the use of human surrogate mothers who receive fertilized ova and carry it until birth is now a reality and is being practiced globally. The major

reason is the urge to have one's own flesh and blood in their progeny.

Now-a-days, in the practice of surrogacy, one new system has been evolved where financial attraction or gain is shown to the surrogate and in spite of her unselfish concerns she becomes interested in monetary gains, even sometimes at the cost of life and health of the reproductive subject. The surrogate mother receives financial reward for her pregnancy on the relinquishment of the child which means business of body or body related parts or products. Surrogacy arrangement has attracted the poverty stricken population of India because of economic necessity. The absence of specific laws prohibiting commercial surrogacy is also posing a great difficulty in this regard. The desire to earn a livelihood through surrogacy arrangements have led to the deterioration of the health of the surrogate mother, which is of utmost importance and none cannot visualize its long term consequences. The repeated pregnancies can even affect the cardio-vascular health of the poor illiterate woman, which she may not know. Her health may be satisfactory during the pregnancy because of the money and care provided by the commissioning parents, but her health may not be that good in future. Thus, the human right to health in a surrogacy arrangement involves the question of health of the surrogate mother, the surrogate child, the genetic parents and the commissioning parents. In India, women are generally not as healthy as they are in developed countries due to the poor nutrition levels since childhood. Thus, the talk about their right to health, human rights or reproductive rights becomes meaningless. It seems that the remedy of surrogacy to the basic problem of infertility is generating new problems, which seems sometime more complicated and risky than the original problem in itself. No doubt assisted reproduction is a great scientific achievement. It raises many emotional, social, legal and ethical issues which are faced by the couple, the surrogate mother, the child, the society, the donor as well as by the doctor. At a glance, surrogacy seems like an attractive alternative as a poor surrogate mother gets very much needed money, an infertile couple gets their long-desired biologically related baby and the country earns foreign currency, but the real picture reveals the bitter truth. Due to lack of proper legislation, both surrogate mothers and intended parents are somehow exploited and the profit is earned by middlemen and commission agents. There is no transparency in the whole system, and the chance of getting involved in legal problems is there due to unpredictable regulations governing surrogacy in India. There are incidences where the child given to couple after surrogacy is not genetically related to them and in turn, is disowned by the intended parent and has to spend his life in an orphanage.²

If we look upon the problem of surrogate mothers, things are even worse and unethical. The poor,

illiterate women of rural background are often persuaded in such deals by their spouse or middlemen for earning easy money. These women have no right on decision regarding their own body and life. In India, there is no provision of psychological screening or legal counseling, which is mandatory in USA. After recruitment by commercial agencies, these women are shifted into hostels for the whole duration of pregnancy on the pretext of taking antenatal care. The real motive is to guard them and to avoid any social stigma of being outcast by their community. These women spend the whole tenure of pregnancy worrying about their household and children. The worst part is that in case of unfavorable outcome of pregnancy, they are unlikely to be paid, and there is no provision of insurance or post-pregnancy medical and psychiatric support for them. There are a number of social, moral and ethical issues regarding surrogacy, which has become more of a commercial racket, and there is an urgent need for framing and implementation of laws for the commissioning/genetic parents and the surrogate mother.³

Legal issues regarding Assisted Reproductive Techniques: -

India is emerging as a leader in international surrogacy ever since commercial surrogacy has been legalized by Supreme Court of India in the case of *Baby Manji Yamada v. Union of India*⁴ in the year 2008.⁴

In many Western countries, surrogacy is an accepted mode of having a child. In UK, it was legalized in 1990 for infertile couples, wherein in USA surrogacy arrangement even on commercial basis is allowed. Commercial surrogacy is legal in India, Ukraine, and California while it is illegal in England, many states of United States, and in Australia, which recognizes only altruistic surrogacy. In contrast, countries like Germany, Sweden, Norway, and Italy do not recognize any surrogacy agreements.⁴

Surrogacy in India is much simpler and less costly than any country in the world. The main reasons are low cost treatment, availability of poor surrogates, illiteracy, lack of power possessed by poor Indian women, lack of regulation of ART clinics and better flexible laws. India has become a favorite destination of fertility tourism. Each year, couples from abroad are attracted to India by so-called surrogacy agencies because cost of the whole procedure in India is one third of what it is in United States and United Kingdom. The Indian government has drafted a legislation earlier floated in 2008 and finally framed as ART (Regulation) Bill, 2010. This Bill is still pending with the Government. The proposed law has taken consideration of various aspects including interests of intended parents and surrogate mothers. The proposed draft needs to be properly discussed and its ethical, moral social, legal, medical personal, societal

issues should be widely debated before any law is framed. The bill acknowledges surrogacy agreements and their legal enforceability. Some of the features of proposed bill are that an authority at national and state level should be constituted to register and regulate the IVF clinics and ART centers, and a forum should be created to file complaints for grievances against clinics and ART centers.⁴

The surrogacy agreements are treated at par with other contracts under the Indian Contract Act 1872 and other laws applicable to these kinds of agreements. Both the couple/single parent and surrogate mother need to enter into a surrogacy agreement covering all issues, which would be legally enforceable. A surrogacy contract should include life insurance cover for surrogate mother. The surrogate mother may also receive monetary compensation from the couple or individual as the case may be for agreeing to act as such surrogate. It is felt that to save poor surrogate mothers from exploitation, banks should directly deal with surrogate mother, and minimal remuneration to be paid to the surrogate mother should be fixed by law. The surrogacy arrangement should also provide for financial support for the surrogate child in case the commissioning couple dies before delivery of the child, or divorce between the intended parents and subsequent willingness of none to take delivery of the child so as to avoid injustice to the child. A surrogate mother should not have any parental rights over the child, and the birth certificate of the baby should bear the names of intended parents as parents in order to avoid any legal complications. Guidelines dealing with legitimacy of the child born through ART state that the child shall be presumed to be the legitimate child of the married/unmarried couple/single parent with all the attendant rights of parentage, support, and inheritance. The ART clinics should not be allowed to advertise for surrogacy for its clients, and couples should directly seek facilities of ART Bank. The intended parents should be legally bound to accept the custody of the child/children irrespective of any abnormality in the child/children. Confidentiality should always be maintained, and the right to privacy of the donor as well as surrogate mother should be protected. If a foreigner or NRI is seeking surrogacy, they should enter an agreement with written guarantee of citizenship for the child from their government, and they should also appoint a local guardian who would be legally responsible for taking care of the surrogate during and after the pregnancy till the child is delivered to the foreigner couple or reaches their country.⁶

ICMR Guideline regarding ART: -

The Indian Council of Medical research has come out with a draft Assisted Reproductive Technology (Regulation) Bill and Rules 2008. The draft Bill contains 50 clauses under nine chapters. These are - Chapter 1 of the Bill contains definitions, Introduction, Brief history of ART and Requirement of ART Clinics.

Chapter 2 provides for constitution of a National Advisory Board for ART and State Boards for ART for laying down policies, regulations and guidelines and Registration of authorities for registering ART clinics. ART Clinics Screening of Patients for ART: Selection Criteria and Possible Complications.

Chapter 3 lays down procedure for registration of ART Clinics.

Chapter 4 prescribe duties of ART clinics

Chapter 5 – Provides for sourcing, storage, handling and records keeping.

Chapter 6 regulates research on embryos

Chapter 7 discusses rights and duties of Patents, donors, surrogates and children

Chapter 8 deals with offences and penalties thereof

Chapter 9 is titled "Miscellaneous" and includes power to search and seize records etc. and the power to make rules and regulations. This legislation is intended to be in addition to, and not in derogation of, other relevant laws in force.⁷ The Bill acknowledges surrogacy agreements and their legal enforceability. This will ensure that surrogacy agreements are treated on par with other contracts and principles of the Indian Contract Act, 1872. Although in 2005, ICMR issued guidelines for accreditation, supervision, and regulation of ART clinics in India, but these guidelines are repeatedly violated..⁷

Conclusion

In India, because of high priority given to morality and orthodox societal set up, the practice of surrogacy and related issues have wider ramifications. In some cases, the situation takes an ugly turn bringing law enforcing agencies and the judiciary to play a remedial role. Now the sperm banks, egg banks and cloning have opened a pandora's box. Many clinics and centers are providing these services to Indian and foreign clients. It is urgent need of laws which can check and regulate these activities as it is apparent that surrogacy cases are increasing as an industry. It is advisable to protect the society from onslaught of capitalism over Asian poverty and stop the exploitation of poor women being used as machines.

On the other hand, adoption of the child should be encouraged. If necessary Altruistic surrogacy should be promoted because it shows unselfish concern for the welfare of others. It is high time for the Indian Parliament to study in details the international perspectives on feelings, of infertile couple, financial condition of clients, social taboos and acceptable practice of surrogacy,

Law should be framed and implemented to prevent the rights of women and children and all the parties to surrogacy, i.e. the genetic parents, commissioning parents, surrogate mother and the child. It is imperative that the practice of surrogacy should be legally regulated to prevent victimization and exploitation of both the surrogate mother and

intended parents. It's application in human beings is a challenging ethical issue confronting the society.

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Review Article

Mass Spectroscopy- A current review

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Abstract

The aim of this review is to provide a proper tool for understanding current MS technology. Mass spectrometry (MS) has become a powerful analytical technique for both quantitative and qualitative analysis. Proteomics research, in particular, increasingly depends on MS technologies. Basically, any information gathered from a mass spectrometer comes from the analysis of gas-phase ions. There are three main components of a mass spectrometer: an ionization source, a mass analyzer and a detector. The mass is not what is measured; instead, mass spectrometry determines the mass-to-charge (m/z) ratio or a property related to m/z . A mass spectrum is a plot of ion abundance versus m/z , although in many cases the x-axis is labeled 'mass' rather than m/z . The application of mass spectrometry analyzing proteins and other biological extracts is due to the advances gained through the development of soft ionization techniques

Keywords: Mass spectrometry, analytical technique, biomolecules

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Introduction

Mass spectrometry was introduced by physicists in 1880s. Wilhelm Wien was the first to demonstrate in 1898. Mass Spectrometry is a powerful tool for identifying unknowns, studying molecular structure. Applications of mass spectrometry include identifying and quantitating drug and pesticides in water samples, it also identifying steroids, determining metals at Parts per Quadrillion levels (PPQ). Mass spectrometry is based upon the motion of a charged particle, called an ion, in an electric or magnetic field. The (m/z) mass to charge ratio of the ion affects this motion.^[1] Mass spectrometry research focuses on the formation of gas phase ions^[2] the chemistry of ions, and applications. This review covers the basics of mass spectrometry and its applications.

Mass Spectrometer

Mass spectrometer is an instrument that measures the masses of individual molecules that have been converted into ions, i.e., molecules being electrically charged. Since molecules are so small, it is not easy to measure their masses in kilograms or grams.

A mass spectrometer does not really measure the molecular mass directly, but the mass-to-charge ratio of the ions formed from the molecules. For reasons similar to those discussed in the context of mass, it is inconvenient to measure the charge on an individual ion in units appropriate to the macroscopic. A useful unit for this purpose is the fundamental unit of charge, the magnitude of the charge on an electron. In many cases, the ions encountered in mass spectrometry have just one charge ($z=1$) so the m/z value is numerically equal to the molecular (ionic) mass in Da. There are three essential functions of a mass spectrometers.^[3]

1. The sample of compound is ionized, usually to cations by loss of an electron.
2. In the Ion Source the ions are separated and sorted based on their mass and charge.
3. In the Mass Analyzer the separated ions are then

detected, and the results are displayed on the detector by a chart.

Ionization Techniques

A variety of ionization techniques are used for mass spectrometry.^[4] Most ionization techniques excite the neutral analyte molecule which then ejects an electron to form a radical cation (M^+ other ionization techniques involve ion molecule reactions that produce adduct ions ($M H^+$). The most important factors are the ionization energy and physical state of the analyte. Chemical ionization and Electron ionization are suitable for gas phase ionization while Fast atom bombardment, electrospray, secondary ion mass spectrometry, and matrix assisted laser desorption are used to ionize condensed phase sample.

Electron Ionization

It is the most common ionization technique applied for mass spectrometry. It works well for many gas phase molecules. Although the mass spectra are very reproducible and are widely used for spectral libraries, EI causes extensive fragmentation. Fragmentation^[5] is useful because it provides structural information for interpreting unknown spectra.

Chemical Ionization

It is an ionization technique that produces ions with little excess energy. As a result, less fragmentation is observed in the mass spectrum. CI is often used to verify the molecular mass of an unknown.

In Chemical Ionization the source is enclosed in a small cell with openings for the electron beam, the reagent gas and the sample. In this ionization source, the mean free path between collisions is only 10^{-4} meters. The reagent gas in the CI source is ionized with an electron beam to produce a cloud of ions.

Fast Atom Bombardment (FAB) and Secondary Ion Mass Spectrometry (SIM S)

Both method use high energy atoms to sputter and ionize the sample in a single step. In these techniques, a beam of rare gas neutrals (FAB) or ions (SIM S) is focused on the liquid or solid sample. The impact of this high energy beam causes the analyte molecules to sputter into the gas phase and ionize in a single step. The exact mechanism of this process is not well understood, but these techniques work well for compounds with molecular weights up to a few thousand Dalton, [6-12] Since no heating is required, sputtering techniques are useful for studying thermally labile compounds.

Atmospheric Pressure Ionization (API) sources

It ionize the sample at atmospheric pressure and then transfer the ions into the mass spectrometer. These techniques [13] are used to ionize thermally labile samples such as peptides, proteins and polymers directly from the condensed phase. The sample is dissolved in an appropriate solvent and this solution is introduced into the mass spectrometer. With conventional inlets the solvent increases the pressure in the source region of the mass spectrometer. [14-15]

Elemental mass spectrometry

In elemental mass spectrometry, a technique used mostly for inorganic materials, the elemental composition of a sample is determined rather than the structural identities of its chemical constituents. Elemental mass spectrometry provides quantitative information about the concentrations of those elements. The ion source used in elemental EMS is ordinarily an atmospheric-pressure discharge such as the inductively coupled plasma. In either case, the decomposition of the sample into its constituent atoms and ionization of those atoms occurs in a specially designed source. The resulting atomic-ion beam is then separated or sorted by a mass spectrometer and the signal as a function of m/z used to determine the sample composition. [16]

Isotope ratio mass spectrometry

Natural isotope ratios show significant variations when measured very precisely. Isotope ratio measurements are useful in a wide range of applications, for example, metabolic studies; climate studies using measurements of temperature; rock age dating using radiogenic isotopes of elements such as lead or strontium; In isotope ratio mass spectrometry, element isotope ratios are determined very accurately and precisely. Typically, single focusing magnetic sector mass spectrometers with fixed multiple detectors are used.

Tandem Mass Spectroscopy

This type of spectroscopy simply involves the coupling of one mass spectrometer to another and this hyphenated technique has resulted in the analysis of complex mixtures.

Secondary Ion Mass Spectroscopy

This is one of the most highly developed of the mass spectrometric surface methods; it involves the bombarding of a surface with a beam of ions formed in an ion gun. The ions generated from the surface layer are then drawn into a spectrometer for mass analysis. [17]

Application of Mass Spectrometry

Mass Spectrometry consists of identifying unknown compounds, and determining the structure of a compound by understanding its fragmentation. Other uses include evaluating the amount of a compound in a sample or studying the fundamentals of gas phase in chemistry. Mass Spectrometry is now in very common use in analytical laboratories that study physical, chemical and biological properties of a variety of compounds. Tracking Mass spectrometry and isotope dating are also used to determine the composition of elements in a sample. Fluctuations in mass among isotopes of an element are very rare, and the less abundant isotopes of an element are typically very rare. Mass spectrometry is an important method for the characterization and sequence prediction of proteins. Fundamentally, the two methods for ionization of whole proteins are matrix-assisted laser desorption/ ionization and electrospray ionization. In the other approach, proteins are enzymatically digested into smaller peptides using proteases. The mass analyzer gets introduced from the collection of peptide. [18]

An Evolved Gas Analyzer and Thermal analyzer mass spectrometers are extensively applied in space missions to measure the composition of plasmas. Mass spectrometers were used in healthcare for respiratory gas analysis.

CONCLUSION

Mass spectroscopy is a powerful tool for both quantitative and qualitative applications. It currently available in various configurations with various ionization techniques and mass analyzers. It has been developed for analyzing small inorganic molecules to biological macromolecules and also structural elucidation of unknown's compounds. Thus, it can be concluded that mass spectrometry is used to perform two or more sequential separations of ions usually coupling two or more mass analyzers.

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Review Article

Criminalization Of Marital Rape: Judicial Trends

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Abstract

Marriage is a sacrament where two individuals tie a knot to be together for better and for worse, in sickness and in health, till death does them apart. But many a times, the patriarchal mindset slips into this pious relationship and man treats himself superior and owner of the person and property of his wife. He imposes himself upon his wife for sexual pleasures even if she does not consent to it. This non-consensual sex between the persons who share a matrimonial relationship is termed as 'marital rape'. Though marital rape is one of the most common and hideous forms of masochism in Indian society, it is hidden behind the adorned curtain of marriage. In India, it is melancholic that marital rape exists *de facto* but not *de jure*. But with the escalating cases of violence against women in the domestic sphere, and after the declaration of right to privacy as a fundamental right, the women activists are demanding the protection for rights of women within marriage. The objective of this article is to address the question that whether any man who commits sexual act upon his wife without her consent should get protection from the punishment for rape just because of the existence of marital relationship between them and whether the women loses freedom to say 'no' just because she married to the man who offended her privacy. It argues that a rape is a rape. Be it stranger rape, date rape or marital rape. This paper emphatically supports that there should be deletion of the marital rape exemption that men enjoy in this country.

Key words: Marital Rape, Article 21, Right to Privacy, Dignity, Non-consensual sex, matrimonial, sexual violence

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Introduction

"Law cannot stand still, it must change with the changing social concepts and value. If the law fails to respond to the needs of the changing society, then either it will stifle the growth of the society and choke its progress."

-P.N. Bhagwati

In this ever-changing world, nothing remains constant. Societies keep on evolving and with the changes in the society, the need arises for the law to cope up with them and make adequate provisions to achieve balance between the existing laws and the needs of the society.

On 24th August, 2017, the hon'ble Supreme Court of India delivered the much awaited judgment and accorded the status of fundamental right to the right to privacy¹ (hereinafter called the Right to Privacy judgment) under Article 21 of the Constitution of India, which provides that *"No person shall be deprived of his life or personal liberty except according to procedure established by law."* 'Privacy' is a broad term and has many dimensions attached to it like right to protect one's reputation, choose the mode of dress, faith, sex and sexual orientation. From just being a guarantor of 'right to life and personal liberty', the Article 21 has been extended considerably to include every possible connotation of life. From the right to choose food for one self to choose the mode of livelihood, from right

to enjoy a healthy environment to get education, it includes every aspect of a dignified life. Still, there is one issue to which always a blind eye is turned, and that is, the right of a married woman to say 'yes' and her freedom to say 'no' within marriage.

Supreme Court of India in 2014 declined to hear a case where a woman was brutally raped by her husband and strike down the Exception II of Section 375 of the Indian Penal Code, 1860² which immunizes sexual intercourse of a man with his wife above 15 years of age. However, in October 2017, it increased the age from 15 to 18 years, though refrained from making any observation regarding marital rape.³

Women's consent for sexual intercourse with her husband has unfailingly been taken for granted. It is always assumed to be in affirmation. So, the problem is whether after the Right to Privacy judgment women's right to consent for sexual intercourse within marriage would be considered 'her private affair'.

Marital Rape- A Conceptual Perspective

'Marital Rape' can be defined as the sexual intercourse by a man with his wife without her consent or against her will. It is a form of sexual abuse by one spouse over other. Marital rape can have different forms. For instance, Battery rape, where sexual intercourse is accompanied with acts

of violence, sexual or physical; Force only rape, where only that amount of force is used which is necessary to force the wife to have sexual intercourse, usually when she refuses to have sexual intercourse; and Obsessive rape, where perverse sexual acts are undertaken.

Marital rape, although a common phenomenon, has not been acknowledged in our society as a vice. The age-old concept of sanctity of marriage refuses to accept the reality, reason being marriage seen as a conjugal contract and sex an integral part of it. The state generally does not interfere in the private affairs of any married couple. It sprouts from the notion that husband and wife is one legal entity and state should not unnecessarily interfere in their relationship unless it amounts to any act declared crime by the state.

This also rests upon the patriarchal mindset that women are the property their husbands. This notion was addressed by the Supreme Court in the case of *Joseph Shine v. Union of India*⁴ wherein the court declared unconstitutional the provisions of IPC which criminalize adultery with the effect of rendering it only a ground for divorce. The court while talking about the individual dignity, observed that it has “*sanctified realm in a civilized society*” and it ensures that a woman must be treated in equality with a man in true spirit. It observed that:

“Any system treating a woman with indignity, inequity and inequality or discrimination invited the wrath of the Constitution. Any provision that might have, few decades back, got the stamp or serene approval may have to meet its epitaph with the efflux of time and growing constitutional precepts and progressive perception.”

The court also referred to the various judgments wherein the courts have regarded marriage as a partnership of equals and that wife is not a chattel of husband anymore. These beliefs of subordination of women to men kept alive the male chauvinist environment even in the age of equality on the pretext that it would threaten the unit of family and eventually destroy it. Those who denied or keep denying its existence, broadly give four justifications, which are also the reasons behind non-criminalization of marital rape. They are:

- Contract theory: When marriage is treated as a contract between two individuals, the sexual intercourse between them cannot be illegal so long as the marriage subsists.
- Consent theory: This is the extension of the contract theory and depicts that since sexual intercourse is the integral part of the marriage, consent of the partner need not be taken every time. Women at the time of marriage give their irrevocable consent.
- Proof of showing lack of consent: The difficulty of proving the lack of consent

reaches zenith when it comes to marital rape

- Fear of false accusations: The accusations of rape are easy to make and hard to prove. Fears that a vindictive wife would falsely implicate her husband are not to be ignored.

These grounds make it difficult for the legislature to criminalize the marital rape and this binds the hands of judiciary to take any action in the cases brought before it that allege rape by spouse.

International Perspective

The Universal Declaration of Human Rights, 1948 (hereinafter called UDHR), which is the charter of International Human Rights, defines ‘fundamental freedoms’ and inspires the International Covenant on Civil and Political Rights, 1966⁵ (hereinafter called ICCPR) and the International Covenant on Economic, Social and Cultural Rights, 1966⁶ (hereinafter called ICESCR). Article 16(1) of the UDHR lays down that, “*Men and women of full age, without any limitation due to race, nationality or religion, have the right to marry and to found a family. They are entitled to equal rights as to marriage, during marriage and at its dissolution.*” Under the ICCPR, Article 23 states that:

“1. The family is the natural and fundamental group unit of society and is entitled to protection by society and the State.....

4. States Parties to the present Covenant shall take appropriate steps to ensure equality of rights and responsibilities of spouses as to marriage, during marriage and at its dissolution. In the case of dissolution, provision shall be made for the necessary protection of any children.”

The Declaration on Elimination of Violence against Women (DEVW) 1930 under Article 14 obligates that State should develop penal, civil, labour and administrative sanctions and domestic legislation to punish and redress wrongs caused to women; women who are subjected to violence should be provided with access to the mechanism of justice and, as provided for by national legislation, to just and effective remedies for the harm that they have suffered; State also inform women of their rights in seeking redress through such mechanisms.

Under Convention on Elimination of all forms of Discrimination against Women, 1979⁷ (CEDAW), Article 1 defines “*discrimination against women*” as “*.....physical, sexual and psychological violence occurring in the family, including battering, sexual abuse of female children in the household, dowry related violence, marital rape, female genital mutilation and other traditional practices harmful to women, non-spousal violence and violence related to exploitation.....*”. Article 1 is further clarified by Recommendation 19 on violence against women (GR-19) to include gender-based violence: “*The*

definition of discrimination includes gender-based violence, i.e., violence that is directed against woman because she is a woman or that affects woman disproportionately. It includes acts that inflict physical, mental or sexual harm or suffering, threats of such acts, coercion and other deprivations of liberty. Gender based violence may breach specific provisions of the Convention regardless of whether those provisions expressly mention violence...

The UN CEDAW Committee has recommended that the country should “*widen the definition of rape in its Penal Code to reflect the realities of sexual abuse experienced by women and to remove the exception of marital rape from the definition of rape*”. But even after such recommendation, India has not taken any initiative to criminalize marital rape.⁸

Marital rape has been criminalized in all major economies and total around 80 countries including Nepal (2006), Chile (1999), many states in the USA, Australia, South Africa, Ireland, Canada, US, New Zealand, Malaysia, Ghana, Israel and UK. Poland was the first country to criminalize it way back in 1932 and Australia was the first common law country which criminalized it in 1976.

National Perspective

According to the National Family Health Survey (hereinafter called NFHS), in different Indian states, the percentage of men having forced sex with their wives ranges from 10 to 20 percent while on the country's average it is 6.6 percent. NFHS-3 (2005-06) data on marital rape shows that about 1 out of 10 married Indian women in the age group 15-49 years has been physically forced to have sex by their husbands. The latest round of NFHS-4 (2014-15) depicts that even in wealthy states such as Tamil Nadu, about 4 out of every 10 married women experienced some form of spousal violence. One lakh women reported that they were sexually harassed by men other than their husbands and 6950 women reported that they were forced by their husbands to have sex with them against their will. Another 2014 report by researcher Aashish Gupta of the Rice Institute for Compassionate Economics, found that women are 40 times more likely to be sexually assaulted by their husband than a stranger. He also concluded that less than 1% of sexual assaults within marriage are reported to police.⁹

Within the four walls of a home, where a woman is supposed to feel secure the most, she is robbed of her dignity and faith in the most pious relation. Across all the sites, the International Men and Gender Equality Survey (IMAGES) data showed that sexual violence was most commonly perpetrated against an intimate partner. Researchers noted that the rates presented are likely underestimates of the actual prevalence of rape and sexual violence, as men are not likely to report this violence to an interviewer.¹⁰

Non-criminalization of marital rape is also contrary to the Verma Committee report¹¹ which had pointed out that the “*exemption for marital rape stems from a long outdated notion of marriage which regarded wives as no more than the property of their husbands*”..... “*Whereas marriage in modern times is regarded as a partnership of equals*”. The report points out India's obligations under International Conventions as already mentioned above. The Committee was conscious of the recommendations made by the UN CEDAW Committee in February 2007.

Verma Committee report recommended that, firstly, the exception for marital rape be removed and secondly, the law ought to specify that:

- a. A marital or other relationship between the perpetrator or victim is not a valid defence against the crimes of rape or sexual violation;
- b. The relationship between the accused and the complainant is not relevant to the inquiry into whether the complainant consented to the sexual activity;
- c. The fact that the accused and victim are married or share an intimate relationship may not be regarded as a mitigating factor justifying lower sentences for rape.

The government-appointed panel on the status of women in India, the Pam Rajput committee¹², which said that marital rape must be considered an offence irrespective of the age of the wife and the relationship between the perpetrator and survivor. Dr Faizan Mustafa, Vice-Chancellor of the NALSAR University of Law in Hyderabad, said that India must change its stance on marital rape: “*Courts have been conservative ... but India must amend its criminal law ... marriage does not mean a permanent consent from one's wife.*”

In the Department-Related Parliamentary Standing Committee on Home Affairs¹³, there was a recommendation of including Section 376A in IPC for marital rape which would not be restricted to the status of separation and punishment would not be restricted to an imprisonment of 2 to 7 years but would comply with the punishment under Section 376(2) (e) of IPC. Some members of the committee suggested that somewhere there should be a room for wife to take up the issue of marital rape. However, others felt that the marital rape has the potential of ruining the institution of marriage by bringing it under great stress. The Committee said that if a woman is aggrieved by the acts of her husband, there are other means of approaching the court. It was, therefore, held that if the marital rape is brought under the law, the Committee may perhaps be doing more injustice. This committee ended its report on a sad note expressing dissatisfaction with the way the Verma Committee recommendations have been diluted.

The government takes refuge behind the 172nd report of the Law Commission of India, released in 2000, which did not recommend the criminalization of marital rape. This report refused to accept the petition of the Sakshi organization for deleting the Exception II of the Section 375 IPC on the grounds that it violates Article 14 as it discriminates against married woman and said:

*"Representative of Sakshi wanted us to recommend the deletion of the Exception, with which we are unable to agree. Their reasoning runs thus: where a husband causes some physical injury to his wife, he is punishable under the appropriate offences and the fact that he is the husband of the victim is not an extenuating circumstance recognized by law; if so, there is no reason why concession should be made in the matter of offence of rape/sexual assault where the wife happens to be above 15/16. We are not satisfied that this exception should be recommended to be deleted since that may amount to excessive interference with the marital relationship."*¹⁴

The objections that are put to deny the criminalization of marital rape are contradicted as follows:

A. Implementation of the laws

The most common argument against the criminalization of marital rape is that such law criminalizing it would be difficult to implement. It is a common apprehension that women would start using such law as a sword and file fallacious cases against their husbands to harass them. Therefore, the only solution that is offered is pre-marital and post-marital sex education in the country. But after witnessing the ground realities, in a country where gender equality is a myth, sex education is invisible and maximum number of acts of violence goes unreported, it would be wrong to suggest this as the only solution. Although this can support the legal mechanism that is essential to criminalize the marital rape.

Talking on the similar lines of the possibility of abuse of any legislation, in D.D. Basu¹⁵, it has been noticed: *"(a) The possibility of abuse of a statute does not impart to it any element of invalidity. (b) Conversely, a statute which violates the Constitution cannot be pronounced valid merely because it is being administered in a manner which might not conflict with the constitutional requirements. It is well settled that mere possibility of abuse of a provisions of law does not per se invalidate legislation. It must be presumed, unless contrary is proved, that administrative and application of a particular law would be done "not with an evil eye and unequal hand"*¹⁶.

In *Budhan Choudhry v. State of Bihar*¹⁷, a contention was raised that a provision of law may not be discriminatory but it may lend itself to abuse bringing about discrimination between the persons

similarly situated. The apex court repelled the contention holding that the possibility of abuse of a provision is not a ground to hold legislation arbitrary or discriminatory and, thus, violative of Article 14 of the Constitution of India which provides that, *"The State shall not deny to any person equality before the law or the equal protection of the laws within the territory of India."* The same can be held for enactment of legislation criminalizing marital rape.

Given that marital rape is a crime in so many countries, it is possible to include safeguards to protect husbands from unfounded allegations. And it would not be much difficult after the case of *Rajesh Sharma v. State of Uttar Pradesh*¹⁸, where the Supreme Court ordered the formation of 'Family Welfare Committee', for scrutinizing every application made under Section 498A of the IPC which punishes husband or the relative of husband who subjects the wife to cruelty, in each district by the District Legal Services Authority, which shall give a report to the police in a month after looking into any complaint under Section 498A. Till such a report is submitted, no arrest should normally be made. The court directed that such committees should be peopled by para-legal volunteers/ social workers/ retired persons/ wives of working officers/other citizens and should be imparted basic minimum training and given such honorarium as may be considered viable.

This case was, however, overruled in *Social Action Forum for Manav Adhikar v. Union of India*¹⁹ wherein the Supreme Court held that the institution of Family Welfare Committee was not in accordance with the provisions of the Code of Criminal Procedure, 1973²⁰ (hereinafter called CrPC). The author, however, feels that the setting up of Family Welfare Committee would help in filtering the true cases from the fake ones. This would not only discourage the filling up of frivolous cases but also help in reducing the unnecessary burden upon the courts which stagnates the functioning of the judicial system.

This suggestion was also made in the case of *Lalita Kumari v. Government of Uttar Pradesh*²¹ wherein the Supreme Court gave certain instances where a preliminary report can be filed before filing of FIR. This would help in filtering the frivolous cases out and preventing the abuse of law.

B. Protection of institution of marriage

It is often argued that criminalization of marital rape will weaken the institution of marriage as there lies a fear of misuse of law women to harass their husbands as has been the case with Section 498A of IPC. This in turn would leave the innocent husband and his family in a helpless situation.

Though there can be no denying the fact that there are women who use such anti-man laws to harass their husbands and in-laws, but the irony is that most of the women for whom such law is made do

not even know about them. No one can deny that marriage is a sacrament and a private affair. Generally, courts and police do not interfere in it. But since when has our Constitution and judiciary started taking back seat when the need arises for the protection of the rights of the individual? Is a marriage which does not provide equal rights to both the partners worth protecting? How will marriage system in our country undergo 'great stress' if we give marital rape victim her right to seek redress?

C. Existence of other laws

There is another argument that the violent acts of the husbands are already punishable in IPC under other heads like assault or criminal intimidation or grievous hurt or under The Protection of Women from Domestic Violence Act, 2005²² (hereinafter called DV Act). Regarding IPC, there is a reason why every crime has been separately defined. This is based upon the principle of fair labelling which suggests that the burden of only that offence should be placed upon the accused which matches the wrong committed by him. Each offence is constituted of different ingredients. Though acts of forced sex can cause hurt or grievous hurt, but still cannot be included only under Section 323 and 325 of the IPC which punish voluntarily causing hurt and grievous hurt respectively. Under Section 3 of the DV Act, the definition of domestic violence is wide enough to cover every type of abuse but rape has been separately defined viz. mental abuse, physical abuse, sexual abuse, verbal and emotional abuse under Section 3. Moreover, the remedy under the DV Act is more civil in nature that includes protection orders, residence orders, monetary reliefs, custody orders and compensation orders. There is only one circumstance where imprisonment upto the term of one year or fine upto twenty thousand rupees or both can be imposed under Sub-section 1 of Section 31 of such act where the respondent breaches the protection orders of the magistrate. Violence or assault that accompanies the sexual intercourse cannot modify the offence of rape that has been perpetrated. It does not change the nature of the offence just because the subsistence of marital relationship between the accused and the victim.

Right To Privacy And Dignity Vis-À-Vis Marital Rape: Judicial Trends

There is an old aphorism, "*a man's house is his castle*". Sadly, the 'men' of this country have taken this too literally, considering their house to be their castle where they are the owner of everything inside. And it will not make any difference to them whether they buy a furniture or marry a fellow human being. They can treat both in the same way as they want.

What made the eclipsed debate on marital rape come up again in the limelight was judgment delivered by Supreme Court solving the dichotomy

in Exception 2 to Section 375 of the IPC where the sexual intercourse by a man with his wife who is not below 15 years was not rape in the case of *Independent Thought v. Union of India*. The age has now been increased to 18 years. Justice Deepak Gupta clarified that the Section 198(6) of CrPC which provides that the court shall not take cognizance of an offence where a wife alleges sexual-intercourse by her husband if more than one year has elapsed from the date on which offence was committed will apply to cases of rape of wives below 18 years.

Justice Madan B Lokur noticed that the most important issue there was the child marriage and not the marital rape. Although the judgment made no observation upon the issue of 'marital rape', it ignited a ray of hope in the hearts of those fighting for the cause of umpteen women who have been treated as nothing more than sex objects. It brought the attention to the idea that modesty of a woman deserves to be protected no matter what her age is. This is an inherent attribute of her womanhood.

In *RIT foundation v. Union of India*²³, Supreme Court through the bench of Justice AR Dave and Justice R Banumathi while dismissing the petition of woman who was brutally raped by her husband said, "*You are espousing a personal cause and not a public cause...This is an individual case.*" The woman had challenged the validity of an exception to Section 375 of the IPC that allows marital exemption to rape.

The Gujarat High Court in *Nimeshbhai Bharatbhai Desai v. State of Gujarat*²⁴, while dealing with the case filed by a wife against her husband for forced and perverted unnatural sex, the court made sincere observations regarding the marital exemption of rape. The court despised the fact that even in 21st century women are treated as a chattel and property of their husband. Marital rape ought to be a crime and not a concept. It said that, "*It has been long time to jettison the notion of 'implied consent' in marriage. The law must uphold the bodily autonomy of all women, irrespective of their marital status.*" It demanded legislative intervention by saying, "*A law that does not give married and unmarried women equal protection creates conditions that lead to the marital rape. It allows the men and women to believe that wife rape is acceptable. Making wife rape illegal or an offence will remove the destructive attitudes that promote the marital rape. Such an action raises a moral boundary that informs the society that a punishment results if the boundary is transgressed. The husbands may then begin to recognize that marital rape is wrong. Recognition coupled with the criminal punishment should deter the husbands from raping their wives. Women should not have to tolerate rape and violence in the marriage. The total statutory abolition of the marital rape exemption is the first necessary step in teaching societies that dehumanized treatment of women will not be tolerated and that the marital rape is not a*

husband's privilege, but rather a violent act and an injustice that must be criminalized."

These judgments can have an influence on the Delhi High Court which agreed to hear the petition of an NGO RIT Foundation, All India Democratic Women's Association and a marital rape victim, who have sought striking down of the Exception II of Section 375 of the IPC.

Nevertheless, the judgment delivered by Supreme Court in the Right to Privacy judgment can have a far-reaching influence on the right to privacy of a married woman. Justice Chelameswar, in his judgment, said, "*The Constitution cannot be seen as a document written in ink to replace one legal regime by another. It is a testament created for securing the goals professed in the Preamble²⁵. Part-III of the Constitution is incorporated to ensure achievement of the objects contained in the Preamble.²⁶ 'We the People' of this country are the intended beneficiaries²⁷ of the Constitution. Personal liberty takes within its sweep not only the right not to be subjected to physical restraints, but also the freedom of thought, belief, emotion and sensation and a variety of other freedoms. The most basic understanding of the expression liberty is the freedom of an individual to do what he pleases. But the idea of liberty is more complex than that.*"

Justice DY Chandrachud, in the Right to Privacy judgment, while talking about the acts of violence perpetrated to women within the four walls of house, said, "*It must also be noticed that women have an inviolable interest in privacy. Privacy is the ultimate guarantee against violations caused by programmes not unknown to history, such as state-imposed sterilization programmes or mandatory state-imposed drug testing for women. The challenge in this area is to enable the state to take the violation of the dignity of women in the domestic sphere seriously while at the same time protecting the privacy entitlements of women grounded in the identity of gender and liberty.*"

The marital rape exemption allows her bodily integrity to be taken from her forcibly. It not only gives legal immunity to a man who forcibly sexually assaulted his wife but also robs the wife of control over her body. Letting a man go from the consequences of an act which otherwise would be called rape, denies a woman justice just because the perpetrator is her husband.

One of the earliest cases where the constitutionality of State's action allegedly infringing the right of privacy fell for the consideration was before the US Supreme Court in *Griswold v. Connecticut*²⁸. The Supreme Court of the United States sustained a claim of a privacy interest on the theory that the Constitution itself creates certain zones of privacy - 'repose', 'sanctuary' and 'intimate decision'. "Repose" refers to freedom from unwarranted stimuli, "sanctuary" to protection against intrusive observation, and "intimate decision" to autonomy

with respect to the most personal life choices. Commenting on *Griswold* case, the Eisenstadt Court noted: "*It is true that in Griswold the right of privacy in question inhered in the marital relationship. Yet the marital couple is not an independent entity with a mind and heart of its own, but an association of two individuals each with a separate intellectual and emotional makeup. If the right to privacy means anything, it is the right of the individual...*"²⁹

Although right to privacy was talked about in *Griswold* case in consideration with the marital relationship, the Court subsequently made it clear that the right to privacy is a right independent of marital relationship. In *Carey v. Population Services International*³⁰, re-examining *Griswold* case, the court observed that the interest protected by the right of privacy was not the sacred precincts of marital bedrooms but rather the individual's interest in making certain important decisions. The right protects an individual's interest in making autonomous decisions on fundamental issues, unfettered by undue governmental interference.

To suggest that marital rape exemption protects privacy of a marital relationship is just another way to maintain the authority of a man in a relationship. However, it has to be realized that it is not the privacy of the marital relationship but that of the woman and her autonomous control over the intimacies of her body and her life at risk. The exemption keeps alive the ancient notions that woman is the property of her man and in particular husband has the right to control the wife. These beliefs became outdated long ago and today marriage is treated as the partnership of equals. The purpose of law today is to protect the dignity and privacy of every individual and existence of this exemption contradicts this very purpose.

The declaration of right to privacy to be an intrinsic part of 'life and personal liberty' under Article 21, has injected hope in the proponents of women liberation adding catalyst to their movements. The issue in the judgment revolved around the existence of right to privacy of persons which was earlier denied by judgment in *M.P. Sharma v. Satish Chandra, District Magistrate*³¹ and *Kharak Singh v. State of Uttar Pradesh*³² case. Right to privacy does not find explicit mention anywhere in the Constitution, nor was it a part of the constitutional assembly debates. But to rule out it absolutely, must not have been the intention of the constitution makers.

In *Maneka Gandhi v. Union of India*³³, Article 21 was beautifully explained by the Apex Court. It was laid down that right to life does not mean a mere animal like existence. It encompasses a life with dignity. In *Francis Coralie Mullin v. Union Territory of Delhi*³⁴, the court further highlighted the idea of right to life under Article 21 of the Constitution. It incorporates the right to live with human dignity and everything that accompanies it like the minimum

essentials of life, for instance, adequate nutrition, clothing and shelter over the head and freely moving about. Right to live with dignity is the most remarkable component of right to life. In the cases of rape, the offence is committed not only against the body but against the life with dignity also. In *The Chairman, Railway Board v. Chandrima Das*³⁵ the Supreme Court observed that rape is not merely an offence under the IPC but a crime against the entire society. In *Bodhisattwa Gautam v. Subhra Chakraborty*³⁶, the court held that the marital rape exemption is the violation of spouse's entitlement to live with human dignity. Any law that blemishes the entitlement to live with dignity and gives spouse to force wife to have sexual intercourse against her will is unlawful.

In the case of *State of Maharashtra v. Madhukar Narayan*³⁷, the Court endowed upon every woman a right to enjoy her sexual privacy and prevented it from being violated by any person. This right without being extended to the right to privacy inside a marriage also would be rendered meaningless. Relying, amongst others, on *Sucheta Srivastava v. Chandigarh Administration*³⁸ and *Smt. Selvi v. State of Karnataka*³⁹, the court in the Right to Privacy judgment asserted that the right to bodily integrity and the right to make reproductive choices come under the ambit of Article 21 of the Constitution. The court holds that rape, being a heinous crime violates the right to bodily integrity and also affects the survivor's right to make reproductive choices. Non-criminalization of Marital Rape is contrary to the provisions of the Constitution of India which considers all women as equal human beings who have a right to live with dignity and free from violence within and outside marriage.

Domestic violence is a crime in India. If authorities can intervene in that intimate area between spouses, why should rape be any different? Courts and police do not interfere in it and the intention is always to keep husband and wife together keeping intact the law of nature i.e. "*Conjunctio maritum peminæ eet de nature*". But once love flies out through the window, the law enters through the door. And if marriage is sacred, someone should tell Indian men to respect its sanctity by not forcing sex on their wives but instead respecting her choices and decisions. The intention of the law should not be to protect an institution that does not respect the dignity of women. A relationship that makes a woman sex slave does not deserve to be protected.

In the words of Shashi Tharoor, "*What the legislature is overlooking is that rape is not a matter of sex. It is a matter of violence. It is a question of forced violence upon a woman. And whether that happens within a marriage, or whether it happens outside, when you are guilty of violence, the state should criminalize it.*" "*Men don't want to criminalize marital rape because they don't want to give the woman the power to say 'no',*" said Priya Nanda, Group Director of social and economic development

at the International Centre for Research on Women. A 2014 study, *Masculinity, Intimate Partner Violence and Son Preference in India*, by the ICRW and the UN population fund, found that 75% of men expected their partners to agree to sex. Moreover, more than 50% of men did not expect their partners to use contraceptives without their permission.

Lack of education cannot be excused to refrain from enacting the law. Trying to preserve the society where wife is raped by her husband, the person in authority and the person within whom trust lies, is even more heartbreaking. It is an irony that slapping your wife is an offence, but raping her is not. Arguing that the wife who has been raped can seek divorce under other laws is not an answer to the problem. What can be more ridiculous than asking a lady to abandon her husband if she has been forced for sex by her husband instead of asking the man to go and apply for restitution of conjugal rights or divorce if his wife denies him the conjugal rights⁴⁰?

Conclusion

From where we stand today if we look back, we would be able to gather the progress we have made as humans and as a civilization, from the Stone Age to the age of tabloids and from a man having animal like existence to a suited man. But why is that we are still not able to discard the patriarchal mindset.

Marital rape distorts the sacrament of matrimony and infuses disrespect in the bond between two individuals who unite under the heavens. The marital rape exemption allows her bodily integrity to be taken from her forcibly. Marriage is a sacrament where two souls are united and sexual relationship forms an integral part. And in a relationship where there is no such freedom, love, trust and respect vanish. The coercive physical invasion takes from the person who is dominated a right to make decision which is manifested in the most intimated aspect of personal identity. Non-criminalization of marital rape denies woman the right to control an essential aspect of her sexuality like freedom to decide for herself when to share her body. What is more appalling to know is that even the woman of easy virtue has the right to privacy as per the judgment of *State of Maharashtra v. Madhukar Narayan* but not a married woman. Consent in marriage cannot be consent forever and for everything.

The need is to understand that outlawing marital rape would not threaten the institution of marriage in India. The idea of protecting women can never be against the values, ethos or tradition of any country or any religion. We have come a long way in recognizing the rights of woman and making this world more sensitive towards them, now re-looking into the laws and changing them to protect their dignity would not do any harm.

Therefore, the marital rape exemption under Section 375 IPC should be undoubtedly removed

and a provision under Section 376 should be added to punish the erring husbands. Safeguards can be provided to this by mandating preliminary enquiry before registration of FIR to prevent frivolous cases. The concept of preliminary enquiry was also suggested in the case of *Lalita v. State of U.P.* in the cases of matrimonial disputes/ family disputes. It will help in maintaining the balance between the rights of both the sexes, right to husband to be saved from harassment due to frivolous complaints and right of the wife to seek redressal.

It is important to realize that issues like this make the social fabric weakened by the silence of law on this. And as it is said,

"Our lives begin to end the day when we become silent about the things that matter."

- Martin Luther King

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27. *Bidi Supply Co. v. Union of India*, AIR 1956 SC 479. "Para 23. After all, for whose benefit was the Constitution enacted? What was the point of making all this other about fundamental rights? I am clear that the Constitution is not for the exclusive benefit governments and States; it is not only for lawyers and politicians and officials and those highly placed. It also exists for the common man, for the poor and the humble, for those who have businesses at stake, for the "butcher, the baker and the candlestick maker". It lays down for this land "a rule of law" as understood in the free democracies of the world. It constitutes India into a Sovereign Republic and guarantees in every page rights and freedom to the side by side and consistent with the overriding power of the State to act for the common good of all.
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that the other party-... (ia) has, after the solemnization of the marriage, treated the petitioner with cruelty;....

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