

Wellness of women embroidery workers

(Junior Faculty)

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High Fashion garments look chic and trendy on people but do we realize that under what conditions these garments are made? High fashion or Haute couture demands lots of hand work or as we may put it euphemistically call it value addition. The work is usually done by girls or ladies in small villages working continuously for eight or more hours. Sitting in one posture continuously has lot of problems which have not been researched exhaustively earlier because of the low value added nature of this link in the manufacturing chain.

Research has proved that bad posture can manifest itself in a variety of ways. Some of the more common signs of incorrect postural alignment include the following

Protruding abdomen

Sunken chest

Hyper extended knees

Unusually flat back

Rounded or uneven shoulders

Swayed back

Curved spine

Uneven hips

Neck craned too far forward

Chin thrust out

The problems become more complex in ladies as they are prone to lot of other ailments apart from the poor nutritional value food that they intake.

A lot of research has been done on how to make the sitting posture of sewing operators more ergonomic with the help of work aids and work stations.

Research proves that posture in sewing operators is constrained by both the visual and the manual aspects of the task, the design of the sewing machine and the table. These have a considerable influence on the posture adopted. The potential for improvement of industrial sewing machines was investigated in a study of the effects of two design parameters (table inclination and view of the needle). It was shown that both trunk posture and head/neck flexion could be improved significantly by altering these design parameters.

This research applies these principles to the working of women in a hand embroidery situation. It uses prior research findings to identify key issues within the posture and working conditions of these women and brings out areas where significant changes could be made. This research would be of interest to people who are studying ways to improve the wellness quotient of women in the apparel supply chain.

1 Literature review and Conceptual Framework

The purpose of this paper is to study the effect of bad posture in the working of women in a hand embroidery industry and apply ergonomics to improve the wellness quotient

1.1 Apparel Trade from India

Apparel trade is growing from India and has immense potential to grow further propelled with the fact that now there are no quota barriers for countries engaged in international trade. Also sourcing of apparels all over the world is becoming very specialized e.g., basic garments to be sourced from Bangladesh, outerwear from Korea/China etc and value added products from India.

“With the dismantling of textile quotas at the beginning of 2005 by the US and Europe, a major opportunity has been opened up for India. In 2004-05, garment exports from India earned \$ 6 billion in foreign exchange out of total textile exports of \$13 billion, which in turn constituted more than 15 per cent of India's total export earnings.

The sector employs 30 million people and is growing at about 8 per cent annually, even when the quota restrictions existed.”(Ref. Business Standard, 2005)

1.2 Types of Hand Embroidery

India is strong in Value-added or embellished garments. This is due to variety of factors –

- Amongst numerous reasons one of the main among them is the master skills of needle work that an Indian artisan possesses and which is passed on to one generation to the other.
- There are villages in India which are specializing in different types of hand embroideries. There is a village near Modinagar in Uttar Pradesh-India which specializes in hand smocking work. In this village at least one member of the family is involved in this profession.
- Additionally there is a wide variety of embroideries available in India which changes very often from one region to another offering its rich cultural heritage.

Zardozi
embroidery



“Zardozi work is an ancient form of embroidery basically done with gold or silver zari threads. It is also known as metal embroidery. Although now-a-days it is also done with colored metal threads. Basically it is done on silk, crepe, brocade and velvet fabrics. Zardozi work is an extension of zari embroidery which is done with crochet hook. The embroidery done gives the appearance of chain stitch. The things required for doing zardozi are beads, dabka, coiled wires, sequins, etc. the design to be done is first traced on the fabric, and then it is spread on the wooden frame. Further the embroidery is done by picking up single thread in the needle and sewing it into the cloth. This art requires patience and is quite complicated. Expertise is required to do it properly.” (Ref. Fibre2fashion, 2008)

Mirror Embroidery

”Mirror embroidery is the specialty of Gujarat state. This work also originated in Persia during 13th century. Mirror work is never done alone; it is generally in combination with other types of stitches or embroideries. This embroidery is done with both large and small mirrors.



This art apart from Gujarat state is also practiced in neighboring state of Rajasthan and in appliqué art of Orissa. Mirror work is done on cushion covers, purses, bed sheets, curtains, wearable garments, wall hangings, decorative items, laces, etc.” (Ref. Fibre2fashion, 2008)

Kantha Embroidery

”Kantha is the traditional form of embroidery of West Bengal. It is running style of stitch. The embroidery is done on many layers of cloth. It is done on quilts, bed sheets, blankets, saris, stoles, napkins, etc.



It is also known as Dorukha. This word means making worn out garments into beautiful garments. Therefore it is also known as recycling art.” (Ref. Fibre2fashion, 2008)

Chikankari Embroidery



“The state of Uttar Pradesh especially the city of Luck now is considered to be the hub of Chikankari embroidery. Chikankari is derived from the word Chakeen that means elegant patterns on the fabric which is a Persian word. Earlier it was done with white thread on muslin clothes. However now it is been done on various types of fabrics like cotton, linen nylon, georgette, chiffon and synthetic fabrics. Apart from wearable garments it is also done on various other things like curtains, bed sheets, table cloths, pillow covers and cushion covers.”(Ref. Fibre2fashion, 2008)

Sequins Embroidery -Sequins are disk shaped beads used for decorative embroidery styles on different fabrics. Sequins are embroidered into the fabric to add grace to that material. (Ref. Utsav, 2008)

Beads Work -A bead is a small, decorative object. Beads can be woven together with specialized thread, strung onto thread or wire to create patterns on the fabric. (Ref. Utsav, 2008)

Stone Work - All types of stones like small, big, expensive, swarovskis, crystals are used in stone embroidery. Stone work looks very chic. (Ref. Utsav, 2008)

All the different type of embroideries have one thing in common –that they all are done by hands and requires lot of hours of precise needle work with sitting in one posture.

1.3 Impact of bad posture

The hand embroidery work is usually done by girls or ladies in small villages working continuously for eight or more hours. This becomes more rigorous as they have to sit in one posture continuously and this itself has lot of problems in different areas like spine, neck, arm etc. Awkward postures can make tasks more physically demanding.

Spine-

Research has proved that most back pain is caused by bad posture whilst sitting. 'Even though bad posture may not cause any discomfort, continual poor posture will in the long term cause back pain.' (ref. Back Care by Health Education Bureau 2006) .As the ladies have to sit in one posture and that to they have to bend forward in order to do their work it leads spine adopting a forward

:C".Although the immediate effects are not visible but as the aging process starts the effects of long hours of wrong posture starts showing on the walking posture of majority of ladies –when they walk with a slight stoop in their bodies.

"Deteriorating health is a frequent, though not an inevitable, part of the ageing process for both sexes and women make up the majority of elderly people in the world. Moreover, the ageing process itself is a highly gendered one and the experience differs for women and men in a number of ways. Older women are biologically more susceptible than men to certain disabling diseases including rheumatoid arthritis, osteoporosis and Alzheimer's disease." (WHO, 1996)

"Shape and prolonged static sitting is frequently accompanied by discomfort and musculoskeletal complications that result from sustained immobility (Hult, 1954; Eklund, 1967; Magora, 1972; Kelsey, 1975; Lawrence, 1977)." Several researchers have evaluated the physiologic affects of changing ones posture or more directly spinal motion. Adams (1983) also found that alternating periods of activity and rest, thereby introducing postural change, further boosts the fluid exchange, helping to nourish the discs. Grandjean (1980) is another who maintains that alternately loading and unloading the spine (through movement) is ergonomically beneficial, because the process pumps fluid in and out of the disc, thereby improving nutritional supply.

This research has lot of relevance to it because the ladies might be sitting in one posture alone for hours and there is no change in their posture also as there very little space to move and also the fact that they are doing embroidery with the

frame at 0 degree. Additionally there is no support for their back while sitting on the floor which further aggravates the situation.

Neck

When the lady is bending forward to do the embroidery work it leads to further complications because at lot of places she has to crane her neck to do justice to the intricacies in embroidery involved.

“As the adult human head weighs between 10 and 20 pounds. When it is held forward the neck, upper back, shoulders, and mid and lower back endure an exponentially greater load. For every inch that the head moves forward in posture, it increases the weight of the head on the neck by 10 pounds! In the example to the left a forward neck posture of 3 inches increases the weight of the head on the neck by 30 pounds and the pressure put on the muscles increases 6 times. Poor neck posture leads to a Forward Head Position which is one of the most common causes of neck, head and shoulder tension and pain. This can be a result of injuries like sprains and strains of the neck leading to weak neck muscles, poor sleeping positions and the illustrated examples of driving stress, computer neck, along with improper breathing habits.”

Long term abnormal neck posture leads to muscle strain, disc herniations, arthritis, pinched nerves and instability.

Shoulders-

“In ideal scenario the elbows, arms, and hands should be maintained at a 90-degree angle while working. Additionally the work area should be large enough to accommodate the worker, allowing the full range of motions involved in performing required tasks, and provide room for the equipment and materials that make up the workstation.”(Office Ergonomics manual-2006)

But this type of a work place is a distant dream for the workers in the units that they are working. As they are working in their houses and the space is very much cramped to have any space for the proper movement of either hands or shoulders. Workers should not constantly work with their arms above shoulder level. Work above the shoulders increases the use of the shoulder muscles. With this constant use, the muscles do not have time to rest and thus tire more rapidly.

2.0 Objectives

This paper contributes to the research in this field of wellness of woman working in the hand embroidery industry with a specific view on India. At the same time it

aims to explore an area of application of ergonomics in the hand embroidery industry where not much study has been done before.

3.0 Methodology

This is a study, involving interviews and focus group discussions. Triangulation of data collection methods have been used to look at the issue from as many perspectives as possible to gain insights into the effect on health of the women working in the hand embroidery industry. This provides insights from different perspectives of the individuals who work in the hand embroidery industry.

4.0 Findings



4.1 In these pictures the ladies are working without any back support, also bending forward with neck craned toward the design and this in long term will have implications of backache and neck pain etc.





4.2 In the above given pictures the girls are working on a “**adda**”-a wooden frame which is either rectangle or circular in shape and supports the fabric on which hand embroidery is to be done.

This technique is definitely better but this also has its disadvantages. As the person has to bend over the designs, affecting body parts-back, neck and shoulders as also shown in the subsequent pictures



Given are the pictures of beautiful patterns that were created using the given embroidery techniques.



4.3 There were a total of five embroidery units covered in different villages where women/girls (total of 30 women/girls) were interviewed for the purpose of gathering information on their well being. The interviews were carried out in the villages where the literacy level amongst the women/girls was very low so a tool like questionnaires could not be used effectively.

The findings that came out of these interviews /focus group approach were as follows:

4.3.1 The subjects are not aware of areas like best postures at work. They were keen to learn it after educating them about the effect of bad posture but they had certain pre conceived notions on about how to do the hand embroidery techniques

4.3.2 They are also not aware of the ill effects of the faulty postures to their health that they are adopting currently.

4.3.3 They are also of the opinion that definitely they will like to improve their condition in terms of posture.

4.3.4 The improvement should not have much cost implications on it.

4.3.5 The ladies questioned would definitely like to working right environment like proper lights, good ventilation and proper hygienic conditions. But all these factors are beyond their controls because of the socio-economic factors.

4.3.6 The ladies complained of chronic back (affecting L1 and L2 of back bone) and neck ache in addition to eyesight problems, some of them even complained of sinus problem which may or may not be influenced by bad postures.

4.3.7 Women at age of more than forty have a problem of urinal bladder due to continuous sitting on the floor as per the interview that was conducted with a medical practitioner.

5.0 Recommendations

5.1 Job Design

Although there are factors that affect the conditions of these working women like education and socio-economic factors, there is no denying that these women need to be uplifted from the condition they presently work in. There can be engineering control for example; to elevate the "adda" they work so as to reduce the impact on their back. Further appraisal various and refinement will continue as the organization provide valuable reflections on how the control has been received.

Ensuring work is not hampered: these controls can be developed and maintained across organizations .It is a gradual process but as benefits in the program begin to be acknowledged, it is hoped that this goal will be achievable. Working Women struggling with external demands and a competitive global workplace deserve a progressive, supportive and comfortable working experience.

5.2 POSTURE ANALYSIS METHOD

Posture analyses techniques can be classified into two major categories are exposure assessment method and root cause analysis method.

Posture analysis method: determine whether or not work uses posture likely to have adverse effects on health and productivity. They measured generally measure the presence and time duration of awkward postures. Most exposure assessment techniques are designed to minimize the time required to collect data. Root cause analysis method: It is used to understand how workplace attributes and work tasks cause awkward postures. **The awkward posture can be improved by changing the angle of the embroidery table (Adda).As they are working at 0° postures on which they are suffering from various health problem. So if they raise the inclination at angle 35° hence the person can sit properly and do the work.** They don't have to bend or stretch body to the table to get an angle research as take place at different angle like 10° 20° 30° & 40° . Hence the angle which lies from 33° -37° is good working posture. If goes

beyond 37° it will move more towards the face where the worker will sit properly but can also give support to him on working hand.

5.3 POSTURE CHECKLIST

Primary goal of a posture checklist is to quickly analyze a large number of jobs and to identify situations where work posture may cause excessive fatigue and injury. A posture checklist is an exposure assessment tool that can be used by persons with relatively little formal training in both posture analysis and ergonomics.

The checklist serves as a preliminary screening tool that classifies a job as either “acceptable” or “requiring further study.”

Checklists do not provide precise quantitative measures of exposure or identify root causes of awkward posture, follow-up analysis must be performed on all “further study” jobs

After providing training to the workers we came across that the person to whom training was given is not facing the problems as the untrained person is facing. And even now the embroidery table is also set at an angle of 33 to 37 degrees which helps the worker to sit in a right posture.

TRUNK

None Some Critical

		✓	Sit without Backrest
		✓	Mild forward bending
		✓	Severe forward bending

SHOULDERS

		✓	Left: upper arm used at or above mid-torso
		✓	Right: upper arm used at or above mid-torso

5.4 Equipments and procedures:

The first step in the analysis was to study a continuous video tape of the job, using any portable video camera and recorder. When making the tape, essential that the camera angle is chosen so that all joints of interest (trunk, neck and shoulder) are not obstructed. For highly repetitive work, several work cycles should be recorded continuously from each camera angle. This assures that that

all major work activities were documented.

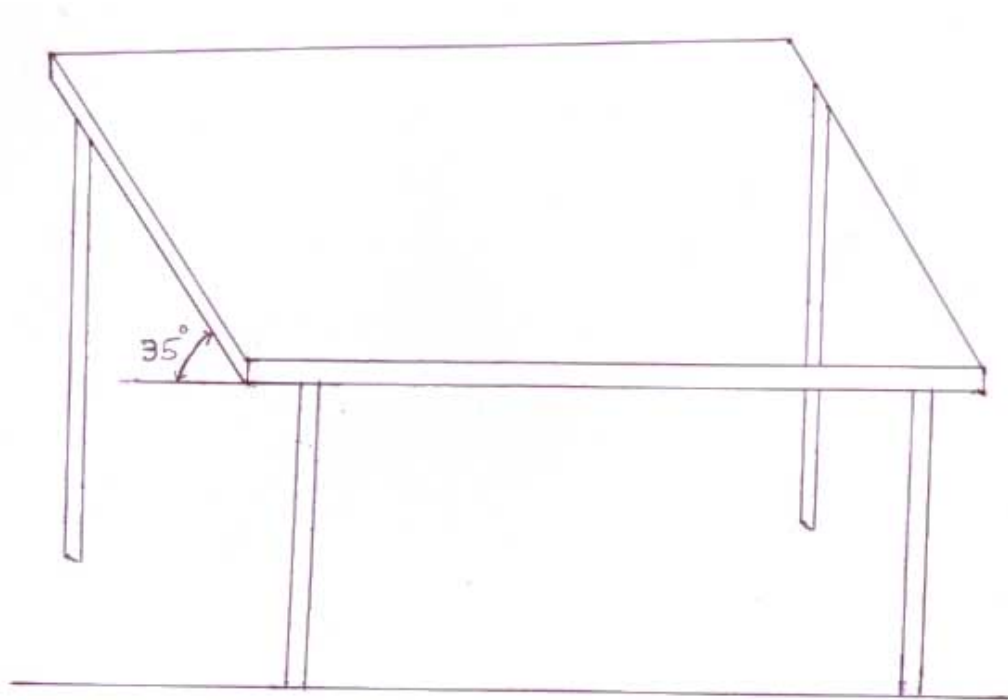


Diagram of the proposed raised table/frame (“Adda”) raised at an angle of 35 degrees.

5.5 Model simulation-for different angles to find the best angle for worker to reduce health hazards

Application of principles of Ergonomics:

Ergonomics is the study of the relationship between a person and their work environment. The objective is to adapt work place for the worker in order to decrease the risk of injury and improve the link between the worker and their environment.

Ergonomics in a workplace is usually controlled by two broad factors: Human factor or 'cognitive' ergonomics influenced by decision making process ,organization design, human perception relative to design ;and industrial or physical ergonomics which involves physical aspects of the workplace and human abilities such as force required to lift, vibration and lift.

Awkward body postures are a major ergonomics concern in the women's body. Awkward postures take the body away from a comfortable position, which reduces efficiency and increases the use of energy. Another major concern is static postures. Static means to hold in place, so these are postures where the body is held in one position for long period of time. These types of postures require constant muscle use for the time the body is held in position. This reduces rest and recovery time, which leads to muscle tiredness.

Work above the shoulders increases the use of the shoulder muscles. With this constant use, the muscles do not have time to rest and thus tire more rapidly.

The following given recommendations which will help to reduce the risk of injury due to the above concerns for further research agenda: Additionally it becomes very necessary to do something in this field because than we are actually making a person comfortable in her work, because women in rural villages of India are

the ones who are doing all household chores by way of bringing water from the well, cooking food in a wood stove, tending animals etc.

So if we can contribute in some way by helping in making the work environment comfortable it will be our first step towards emancipation of women in villages.

5.5 Scope of future work

The author will continue this research by assessing the impact of the re-engineering and postures on women embroiderers by constructing a model frame to do embroidery- whereby alleviating some ailments connected with hand embroidery for women and also by way of educating the concerned people.

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