Report
Footwear Project Funded by ILEP
March 2017 to March 2018

Project Report
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Nandnagri Delhi-93
Report of ILEP footwear Project

Name of the project:
Improving acceptability and compliance with protective footwear

Project Summary:
To develop new models of MCR footwear in different colours and designs which will be more acceptable and at par with footwear which are locally available and to increase the acceptability of MCR footwear, which will ultimately lead to reduced disability and deformities. These new footwear models will be developed in different colours and designs both for males and for the female. The models which will be developed will be at par with the models which are commercially available in the local market.

Project Description:
- To develop the MCR footwear in various colours and designs as per the request of the person affected by leprosy, which are at par with the models available locally.
- To assess the effectiveness of MCR footwear developed in various colours and designs in reduction of the incidence of ulcers.
- To assess the acceptability of and compliance with the newly developed MCR footwear.
- To assess the social participation level of the person before and after using the newly developed MCR footwear

Date of start of Project: March 2017 (Grant received in June 2017)
Date of end of project: March 2018 (will complete Project in May 2018)

Total Grant Recieved: 5000 swiss francs

Background of the Project:
Appropriate protective footwear made of the MCR (Micro Cellular rubber) is recommended by the National Leprosy Eradication program (NLEP), in India for the person affected by leprosy with sensory loss in the sole of the feet\(^1\). In most instances, this footwear are either pre-fabricated or ordered in bulk by the organization as per the foot size which are usually made by the shoe technician with minimal equipment's so the finishing and outlook is not at par with the commercially available footwear. In addition, the availability of the MCR footwear is limited to black colour and fixed design and they are same for both male and female. Most of the time acceptability of the footwear is questionable because of improper fitting, lack of suitable designs for male and female and various other reasons. The people affected by leprosy with anesthetic feet are often reluctant to use the MCR footwear, in spite of the realization by them that the protective footwear is essential to prevent secondary damage to their feet\(^2\).

This reluctance to use the proper footwear is one of the main reasons for the progression of impairment from primary to secondary in patients with anesthetic feet. It is recommended that the person with anesthetic feet should also be able to select the proper footwear for their feet and it should have following qualities\(^3\):
1. It should fit the size and shape of the foot.
2. It should be affordable and cost effective.
3. It should be easily available.
4. Should aesthetically pleasing to a person who is using the footwear.
5. The widest part of the shoe must fit the widest part of the foot.
6. The shape of the shoe must fit the shape of the foot.
This study will develop a footwear with various designs using these recommendations to improve the compliance in use of MCR footwear which will ultimately reduce the disability due to loss of sensation in the feet.

**Need of Project:**
As per the guidelines of ILEP and WHO, footwear with MCR is required for all the person affected by leprosy with insensitive feet. These footwear need to have following specification:

1. Should have hard outer soles
2. Should have insole made of MCR.
3. Should have adjustable front strap.
4. Should have adjustable back strap.
5. No metal buckle should have been used.
6. All the parts should either be stitched or glued.

MCR footwear which are being fabricated in our hospital and provided in the government program comes with limited colour mainly black colour and with limited designs (mainly X-type or Y-type Models). Most often the colour which is given to the patients is black.

1. **AIMS/OBJECTIVE/OUTCOMES:**
   1.1 **Hypothesis or research question:** -
   1.2 **Overall aim:**
   To develop new models of MCR footwear in different colours and designs which will be more acceptable and at par with footwear which are locally available, which will improve acceptability and reduce foot ulcers.
   1.3 **Objectives:**
   1. To assess the effectiveness of MCR footwear developed in various colours and designs in reduction of the incidence of ulcers
   2. To assess the acceptability of and compliance with the newly developed MCR footwear
   3. To assess the participation level of the patient after using the newly developed MCR footwear
   1.4 **Expected Outcomes:**
   The new footwear (designs) developed through this research study will increase the continuous use of the footwear, thereby reducing the risk of plantar ulcers.

   a. **Scientific justification**
   A study was conducted in TLM Community Hospital Nandnagari Delhi-93, it revealed that those people affected by leprosy with anaesthetic feet were not using MCR footwear because following reasons, among other things:
   - MCR footwear were not available in different colours.
   - MCR footwear were not available in different designs
   - MCR footwear were not customised as per the need of the patients.
     o Eg. Black MCR is not liked by female patients
   - Some person affected by leprosy wanted to use only closed footwear.
   - Some person affected by leprosy wanted that the length of the Velcro straps should be more.
Wanted MCR in new colours except black.

b. Objectives and key deliverables

I. To develop the MCR footwear in various colours and designs as per the request of the patient, which are at par with the models available locally

II. To assess the effectiveness of MCR footwear developed in various colours and designs in reduction of the incidence of ulcers

III. To assess the acceptability of and compliance with the newly developed MCR footwear

IV. To assess the participation level of the patient after using the newly developed MCR footwear
Project Description:

Development/ Fabrication of footwear:

Considering the requirements of the footwear by the person affected by leprosy and developing the footwear in various colours a step wise procedure was followed.

STEP1:

Selecting models from the markets and discussing these models with the prospective users of the footwear. Models and designs of the footwear were selected only if they satisfy the criteria, such as that it can be fabricated easily and locally and cost effective. A survey was done in the local market and some designs of suitable footwear were also taken from the internet. Input was taken from person affected by leprosy in developing these footwear. Designs which were selected were discussed with the team of rehabilitation professional working in TLM Shahdara hospital like counsellors, paramedical workers, occupational therapists, physiotherapists, shoe technician and doctors. Around five models for males and three models of females were selected from the various models which were procured from the local market.

<table>
<thead>
<tr>
<th>Visit to Agra footwear Market</th>
<th>Visit to Karol Bagh footwear Market</th>
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<tr>
<td>![Agra Market Image]</td>
<td>![Karol Bagh Market Image]</td>
</tr>
</tbody>
</table>
STEP 2:

After selecting and sketching designs of footwear on paper, procurement of the appropriate material for fabrication of the upper (strap) part of the footwear was done. Material which was to be used for the fabrication of the upper part of the footwear was discussed with the shoe technician and local cobbler.

For procurement of the material some local markets were visited in and around Delhi. Appropriate material was selected for the fabrication of the upper part of the footwear. Following material was selected for the fabrication of the upper straps:
1. Leather in different colour (mainly bright colours for females)
2. Lycra in different colours
3. Rexine in different colours
4. Soft inner lining made up of foam.

STEP 3:

Procurement of the readymade outer-soles (bottom sole):
In order to give better outlook to the newly designs footwear it was decided that ready made outer-sole should be procured from the market or from the appropriate company. Readymade outer-soles will also satisfy the criteria of hard outer-soles so that a nail should not pierce the outer sole leading to wound and ulcer on the sole.

For the procurement of the outer soles following markets were visited:
1. Karol Bagh Footwear market in Delhi.
2. Hing ki Mandi Market in Agra district of Uttar Pradesh around 250km from our hospital.
As per the requirement, different outer soles were selected for male and female.
Upper straps which were designed and fabricated in different colours and designs were fitted into the outer-soles procured from the market. Inner sole of MCR of 8mm thickness was then fitted into the footwear.

STEP 4:

Fabrication of the upper straps of the footwear with the help of the local cobbler. Local cobbler/shoe technician were kept in the loop throughout the entire process and designs of the upper straps were discussed with them. Local cobblers were asked to submit the samples of the upper straps of the footwear. Some of the selected designs of the upper straps were developed. The designs were developed differently both for males and females. The colours were also selected accordingly like more bright and printed colours for the females and brown, white colours for the male models.
**STEP 5:**

Fitting of the upper straps in to the ready made insoles of the footwear: Newly designed upper straps were then fitted into the ready made outer soles by the help of local cobblers. And only MCR needs to be fitted into the footwear by the shoe technician of the hospital.

**STEP 6:**

Various Designs of the footwear:

In total around 24 new designs were developed under the project. There are separate designs and colours for male as well as females. These new colorful and new footwear designs were displayed in the shoe department of the hospital.

**STEP 7:**

Rennovation of the footwear department for proper display of the models and establishing a footwear shop model:

Some amount from the project was also utilised for the rennovation of the footwear department, in order to establish the footwear shop concept. The footwear room was renovate and all the newly developed models were displayed properly. With the display of the models patient can select the model of his or her choice, just like a commercial footwear shop.
STEP 8:

As per the guideline regarding the distribution of the footwear, which was set by the research committee of the The Leprosy Mission Trust India.

According to this guidelines all the person affected by leprosy who require MCR footwear were given choice to select the designs from the footwear displayed. In the display all the models were kept (both old models and newly developed models)

Developed footwear models:

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<thead>
<tr>
<th>Developed Footwear Models:</th>
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<td><img src="image1.jpg" alt="Image" /></td>
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<td><img src="image2.jpg" alt="Image" /></td>
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<td><img src="image3.jpg" alt="Image" /></td>
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<td><img src="image4.jpg" alt="Image" /></td>
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<td><img src="image5.jpg" alt="Image" /></td>
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<tr>
<td><img src="image6.jpg" alt="Image" /></td>
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</tbody>
</table>
Models for Female:
Response of the patients regarding the footwear:

1. female patients said that they are very happy to have the MCR footwear in bright colours and new designs.
2. both male and female patients said that these footwear are looking so normal that they can wear in social gathering like marriages.
3. female patients are really happy because now they have models which are totally different from the male models.

Present status of the Project:

As far as the present status of the project is concerned, following things have been done:

1. identification of the potential vendors for the supply of outer soles for the footwear.
2. Identification of the markets for the purchase of the materials for fabricating upper straps of the footwear.
3. colloboration with the local cobblers and shoe makers for manufacturing the newly developed footwear in various colours and designs.
4. rennovation of the footwear unit to establish the concept of “footwear shop”

Budget allocated under different headings:

Total Amount Sanctioned for the Project : Rs. 3.25 Lakhs:

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<tr>
<th>S.no</th>
<th>Budget Head</th>
<th>Amount</th>
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<tbody>
<tr>
<td>1.</td>
<td>Travel expenses</td>
<td>Rs. 30,000/-</td>
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<td>2.</td>
<td>Procurement of the MCR sheets</td>
<td>Rs. 60,000/-</td>
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<tr>
<td>3.</td>
<td>Footwear materials like outer soles</td>
<td>Rs. 40,000/-</td>
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<td>4.</td>
<td>Fabrication charges for the complete footwear with material</td>
<td>Rs. 80,000/-</td>
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<tr>
<td>5.</td>
<td>Rennovation of the footwear department ( including new display board, chairs , flooring)</td>
<td>Rs. 80,000/-</td>
</tr>
<tr>
<td>6.</td>
<td>Report writing / Publication of paper</td>
<td>Rs. 10000/-</td>
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<tr>
<td>7.</td>
<td>Misc..</td>
<td>Rs. 25000/-</td>
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<td>Total</td>
<td>Rs. 325000/-</td>
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Actual Utilisation of the Budget:

- Travel and transport expenses: Rs. 23415/-
- Repair and Renovation: Rs. 61396/-
- Procurement of Materials: Rs. 42382/-
- Bill still pending for Payment: Rs. 58000/- for MCR sheets
  Rs. 35000/- Labour and material cost to be paid to vendor

Total expenditure till date: Rs. 217193/-

Remaining Budget will be utilised for procurement of the footwear material and ordering more numbers of footwears.

Number of Beneficiaries Directly Benefitted by the project:

This project will benefit the beneficiaries directly. As the designs and models which will be developed under this project will be given directly to the patients. In this project till date 50 patients are benefitted directly as the newly developed models are given to them.

Future Planning:
Data will be collected from end user and results will published.