The Role of the Trained Paramedical Staff
in Leprosy Control Programme
South and West Kordofan Zone Sudan
A Quasi experimental study
By
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MBBS, Alexandria University
A thesis submitted in partial fulfillment of the degree of clinical MD in Community Medicine Faculty of Medicine, University of Khartoum.
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DEDICATION:

To the memory of professor Khalafalla Mohammed Ahmed

I owe him so much
Abstract

A quasi experimental study was conducted to evaluate the role of the trained paramedical staff in leprosy control program. The specific objectives were to study the impact of training on the knowledge, skills and practice of the paramedics as regard to early case detection, classification of leprosy, case holding, chemotherapy, management of reactions, grading of disabilities, disability prevention and mobilization of the community.

Seventy community-based health facilities (10 health centers and 60 dispensaries) were selected for the study. The paramedical staff in these 70 clinics were taken for the study and trained on the basic items of leprosy including; early case detection, classification of leprosy, case holding, chemotherapy, management of reactions, grading of disabilities, disability prevention and health education to mobilize the community towards leprosy problem. All the patients selected for the study were under the supervision of the selected paramedics; 293 newly diagnosed leprosy patients before the training course in 1995 during the period between Jan 1992 and Dec 1994, 546 newly diagnosed cases after training of the paramedics between Jan 1995 and Dec 1997. The duration of the study was 3 years between Jan 1995 and Dec 1997. Data were collected for both pre and post training periods by the same means including; checking the registers of the patients, questionnaires, focus group discussions and clinical examination of the patients. The impact of training was tested by comparing the pre and post training data using Chi-square. The level of significance was taken at 0.05.
As regards to the results about the knowledge of the paramedics concerning the early case detection; It was improved significantly from (68.57%) before training to (95.7%) after training. P=0.00002. Concerning leprosy classification; changed from (64.3%) before training to (92.9%) after training. P= 0.00004. The knowledge about leprosy reactions changed from (18.57%) before training to (78.57 %) after training. P=0.0000. Regarding treatment of reactions; changed from (15.71%) before training to (68.57%) after training. P=0.0000. The knowledge about the duration of treatment of PB leprosy changed from (35.71%) before training to (90 %) after training.P=0.0000. The knowledge about the duration of treatment of MB leprosy changed from (40%) before training to (95.7 %) after training. P=0.0000. The knowledge about definition of disability Grade 1 improved from (21,43%) before training to (81.43%) after training P=0.0000. The knowledge about definition of disability grade 2; improved from (30%) before training to (81.43%) after training. P=0.0000.

The knowledge about prevention of disabilities improved from (20%) before training to (92.86%) after training P=0.0000.

Concerning the skills of the paramedics; The training was effective in changing the skills positively; Regarding early case detection (32.86%) out of the paramedics were satisfactory before training, (61.43%) after training. P=0.00002. Concerning the ability to classify leprosy; (32.86%) out of the paramedics were able before training to, (61.43%) after training. P=0.00002. Concerning the ability to grade disabilities; (20%) out of them were able before training , (84.3%) after training. P=0.0000.

Concerning the ability of giving proper instructions on MDT; the improvement was remarkable from that; (30%) were able before training,
(74.29%) after training. P=0.00004. the same results were obtained for giving proper instructions about completion of treatment.

(25.71%) of the paramedics were able to give proper instructions on patient self care before training, (72.86%) out of them were able to do that after training, P=0.00001. Concerning the ability of making patient stay on treatment; (24.29%) out of the paramedics were able before training, (72.86%) were able after training. P=0.0000. Concerning the the ability to diagnose leprosy reactions (12.86%) were able before training 55.71% after training, P=0.00002.

Only 10% of the paramedics were able to make proper treatment of reactions before training, (51.43%) after training. P=0.00003.

(31.43%) out of the paramedics were able to discuss the basic facts about leprosy in the clinic before training, (54.29%) after training P=0.0006.

Only (11.43%) were able to discuss the basic facts about leprosy in the community before training, 54.29% after training. P=0.00001.

As regard to the results about the practice of the paramedics; the practice was changed positively and significantly after training according to the following results;

The early case detection was (43.69%) before training, (57.14%) after training P=0.0001. The percentage of leprosy classification was (27.65%) before training, (59.89%) after training P=0.0000.

The compliance with treatment was (44.03%) before training, (67.58%) after training. P=0.0000.

The completeness of treatment was (39.25%) before training, (65.02%) after training. P=0.0000. Tracing of the absentees was (40.9%) before training, (82.3%) after training P=0.0001. The percentage of grading the
disabilities was 36.22% before training, (58.22) after training P=0.0001. Percentage of further disability prevention was (17.8%) before training (92%) after training. P=0.0006.

Concerning the treatment of reactions (40.7%) were treated by the paramedics before training, (83.7%) were treated after training P=0.030.

Concerning community mobilization; (70.1%) out of the participants were highly aware as regard to early sign of leprosy, importance of seeking early diagnosis, treatment and completion of treatment P= 0.3396. (94.1%) out of them were highly aware concerning the transmission of the disease P= 0.0024. (67.5%) out them reported recent participation in the control process. P= 0.03658.

In conclusion: The paramedics showed good knowledge, skills and practice after training as regard to case detection, leprosy classification, disability grading, case holding, chemotherapy, disability prevention, management of reactions, and raising the awareness of the community towards the leprosy problem. So this study showed that, the paramedics in the areas where leprosy is a health problem and there is shortage of doctors; can play a good role and they are reliable in leprosy control programs.
في مساعدة الطبية الكوادر، أداء على التدريب، تقييم، فحص للأهداف، تأهيل، وبرامج، وممارسة، ومقدرة مدى: اكتشاف،.crop، الجزء، لمريض، في برنامج، في مجال، في الأعاصير، تشخيص، وحة، معالجة، في النتائج، الفعالية، في الأجل. (80% + 50%): تأهيل، والصحة، وممارسة، وحمل، وإعداد، وفترة: 1992-1994، بعدها + 0.05). النتائج، ومساهمة، والصحة العامة، والجهد، والبيئة، والصحة العامة. (0.05) للأعمال، والضغط، على 92.9% (p=0.00004)
آثنى على التدرب، زادت نسبة الحالات على 84.3%.

تتضمن أدلة الأنسجة على النسبة 31.43%.

يجعل العلاج إلى النسبة 0.0000.

التشفير ينتهي إلى النسبة 0.0002.

لا يمكن أن يناسب النسبة 95.7% إلى النسبة 0.0000.

يستطيع النسبة 61.43% إلى النسبة 0.0000 النسبة 91.43%.

لذلك يمكن أن يصل النسبة 0.0004 إلى النسبة 74.29%.

لذا يمكن أن يصل النسبة 92.86% إلى النسبة 0.0000.


<table>
<thead>
<tr>
<th>عنصر</th>
<th>نسبة متتابعة</th>
<th>نسبة بعد محاربة</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0001</td>
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</tr>
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</tr>
</tbody>
</table>

**نسبة قبائل النشاط**

- نسبة النشاط في حالات الامراض = 40.9
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- نسبة النشاط في حالات الزائدة = 82.3

**نسبة توسع النشاط**

- نسبة توسع النشاط في حالات الامراض = 0.0003
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- نسبة توسع النشاط في حالات العجز = 0.0001
- نسبة توسع النشاط في حالات الزائدة = 0.0000

**نسبة تغيير النشاط**

- نسبة تغيير النشاط في حالات الامراض = 0.0006
- نسبة تغيير النشاط في حالات لlemen = 0.0003
- نسبة تغيير النشاط في حالات العجز = 0.0001
- نسبة تغيير النشاط في حالات الزائدة = 0.0000

**نسبة حركة**

- نسبة حركة في حالات الامراض = 67.5
- نسبة حركة في حالات لlemen = 40.9
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- نسبة حركة في حالات الزائدة = 82.3

**نسبة تغديد النشاط**

- نسبة تغديد النشاط في حالات الامراض = 83.7
- نسبة تغديد النشاط في حالات لlemen = 40.7
- نسبة تغديد النشاط في حالات العجز = 70.1
- نسبة تغديد النشاط في حالات الزائدة = 82.3

**نسبة تدريب**

- نسبة تدريب في حالات الامراض = 67.5
- نسبة تدريب في حالات لlemen = 40.9
- نسبة تدريب في حالات العجز = 70.1
- نسبة تدريب في حالات الزائدة = 82.3

**نسبة مشاركة**

- نسبة مشاركة في حالات الامراض = 94.1
- نسبة مشاركة في حالات لlemen = 70.1
- نسبة مشاركة في حالات العجز = 43.69
- نسبة مشاركة في حالات الزائدة = 82.3
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To the memory of professor

Khalafalla Mohammed Ahmed

I owe him so much
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Table of contents

<table>
<thead>
<tr>
<th>Abstract</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arabic abstract</td>
<td>V</td>
</tr>
<tr>
<td>Dedication</td>
<td>V111</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>IX</td>
</tr>
<tr>
<td>Table of contents</td>
<td>X</td>
</tr>
<tr>
<td>Section</td>
<td>Page</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Chapter one: Introduction, literature Review and Objectives:</td>
<td>1</td>
</tr>
<tr>
<td>1.1. Introduction</td>
<td>2</td>
</tr>
<tr>
<td>1.2. Rationale</td>
<td>4</td>
</tr>
<tr>
<td>1.3. Literature Review:</td>
<td>5</td>
</tr>
<tr>
<td><strong>1.3.1. Leprosy Control:</strong></td>
<td>5</td>
</tr>
<tr>
<td>1.3.1.1. Objectives of Leprosy Control</td>
<td>5</td>
</tr>
<tr>
<td>1.3.1.2. Strategies for Leprosy Control</td>
<td>5</td>
</tr>
<tr>
<td>1.3.1.3. Leprosy Control and Leprosy Elimination:</td>
<td>8</td>
</tr>
<tr>
<td>What is the difference?</td>
<td></td>
</tr>
<tr>
<td><strong>1.3.2. Leprosy Elimination:</strong></td>
<td>8</td>
</tr>
<tr>
<td>1.3.2.1. Background</td>
<td>8</td>
</tr>
<tr>
<td>1.3.2.2. The Global Strategy Strategy for Elimination of Leprosy</td>
<td>8</td>
</tr>
<tr>
<td>1.3.2.2.1 The Global Plan of Action for Elimination of Leprosy</td>
<td>10</td>
</tr>
<tr>
<td>1.3.2.2.2. Main achievements of the Global Strategy</td>
<td>12</td>
</tr>
<tr>
<td>1.3.2.2.3. Main limitations of the Global Strategy</td>
<td>12</td>
</tr>
<tr>
<td>1.3.2.3. The Intensified Strategy for Elimination of Leprosy 2000-2005</td>
<td>13</td>
</tr>
<tr>
<td>1.3.2.3.1. Basis of the intensified strategy</td>
<td>13</td>
</tr>
<tr>
<td>1.3.2.3.2. Elements of the intensified strategy</td>
<td>14</td>
</tr>
<tr>
<td>1.3.2.4. Strategy beyond elimination</td>
<td>14</td>
</tr>
<tr>
<td>**1.3.3. Integration of leprosy services within the primary health care services.</td>
<td>15</td>
</tr>
<tr>
<td>1.3.3.1. Concepts and rationale of integration</td>
<td>15</td>
</tr>
<tr>
<td>1.3.3.2. Country experiences</td>
<td>16</td>
</tr>
<tr>
<td><strong>1.3.4. Multidrug therapy (MDT)</strong></td>
<td>21</td>
</tr>
<tr>
<td>1.3.4.1. Historical Background</td>
<td>21</td>
</tr>
<tr>
<td>1.3.4.2. Duration of Multidrug therapy</td>
<td>22</td>
</tr>
<tr>
<td>1.3.4.3. Simplified MDT regimens</td>
<td>23</td>
</tr>
<tr>
<td>1.3.4.4. Discontinue supervision of therapy and AMDT in leprosy programmes</td>
<td>24</td>
</tr>
<tr>
<td>1.3.4.5. Flexible drug delivery</td>
<td>25</td>
</tr>
<tr>
<td><strong>1.3.5. Social Stigma attached to leprosy</strong></td>
<td>26</td>
</tr>
<tr>
<td><strong>1.3.6. Leprosy in Sudan</strong></td>
<td>27</td>
</tr>
<tr>
<td>1.3.6.1. Background</td>
<td>27</td>
</tr>
<tr>
<td>1.3.6.2. National Strategy for Elimination of Leprosy</td>
<td>29</td>
</tr>
<tr>
<td>1.3.6.2.1. The objectives of the National Strategy</td>
<td>29</td>
</tr>
<tr>
<td>1.3.6.2.2. The technical elements of the strategy</td>
<td>30</td>
</tr>
<tr>
<td>1.3.6.2. Achievements of the National Strategy</td>
<td>32</td>
</tr>
<tr>
<td><strong>1.4. Objectives of the study</strong></td>
<td>33</td>
</tr>
<tr>
<td>1.4.1. Main objective</td>
<td>33</td>
</tr>
<tr>
<td>1.4.1. Specific objectives</td>
<td>33</td>
</tr>
<tr>
<td><strong>Chapter two: Material and Methods:</strong></td>
<td>34</td>
</tr>
<tr>
<td>2.1. General Outline</td>
<td>35</td>
</tr>
<tr>
<td>2.2. Study design</td>
<td>35</td>
</tr>
<tr>
<td>2.3. Study area</td>
<td>35</td>
</tr>
<tr>
<td>2.4. Study population and Sampling</td>
<td>37</td>
</tr>
<tr>
<td>2.4.1. Selection of the Primary Health Care Facilities</td>
<td>38</td>
</tr>
<tr>
<td>2.4.2. Selection of the Paramedics</td>
<td>38</td>
</tr>
<tr>
<td>2.4.3. Selection of the Patients</td>
<td>38</td>
</tr>
<tr>
<td>2.4.4. Selection of the Households</td>
<td>39</td>
</tr>
<tr>
<td>Section</td>
<td>Page</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>2.5. Data Collection tools</td>
<td>39</td>
</tr>
<tr>
<td>2.5.1. Check List</td>
<td>39</td>
</tr>
<tr>
<td>2.5.2. Clinical examination of the patients</td>
<td>40</td>
</tr>
<tr>
<td>2.5.3. The Survey</td>
<td>40</td>
</tr>
<tr>
<td>2.5.3.1 Paramedical Staff Survey</td>
<td>40</td>
</tr>
<tr>
<td>2.5.3.2. Household Survey</td>
<td>40</td>
</tr>
<tr>
<td>2.6. Data Analysis</td>
<td>41</td>
</tr>
<tr>
<td>Chapter three: Results:</td>
<td>44</td>
</tr>
<tr>
<td>3.1 Knowledge , skills and practice of the paramedical staff;</td>
<td>45</td>
</tr>
<tr>
<td>3.1.1. Background information about the study population;</td>
<td>45</td>
</tr>
<tr>
<td>3.1.2. Knowledge of the paramedics;</td>
<td>46</td>
</tr>
<tr>
<td>3.1.3. Skills of the paramedics ;</td>
<td>48</td>
</tr>
<tr>
<td>3.1.4. The practice of the paramedics;</td>
<td>50</td>
</tr>
<tr>
<td>3.1.4.1. Background information about the patients;</td>
<td>51</td>
</tr>
<tr>
<td>3.1.4.2. Community awareness and participation</td>
<td>53</td>
</tr>
<tr>
<td>3.1.4.2.1. Background information of the participants</td>
<td>53</td>
</tr>
<tr>
<td>3.1.4.2.2. Knowledge and awareness about the disease</td>
<td>53</td>
</tr>
<tr>
<td>3.1.4.2.3. Knowledge and awareness about the transmission of the disease</td>
<td>54</td>
</tr>
<tr>
<td>3.1.4.2.4. Knowledge and practice concerning participation in control activities</td>
<td>55</td>
</tr>
<tr>
<td>Chapter four: Discussion, Conclusion, Recommendations and References:</td>
<td>87</td>
</tr>
<tr>
<td>4.1. Discussion</td>
<td>88</td>
</tr>
<tr>
<td>4.1.1. Knowledge, skills and practice of the paramedics</td>
<td>88</td>
</tr>
<tr>
<td>4.1.1.1. Case-Finding</td>
<td>88</td>
</tr>
<tr>
<td>4.1.1.2. Case-Holding and Chemotherapy</td>
<td>90</td>
</tr>
</tbody>
</table>
4.1.1.3. Disability Prevention 93
4.1.2. Community awareness and participation 95
4.2. Conclusion. 99
4.3. Recommendations 100
4.4. References: 101

Annexes

Annex1: Check list for assessment of the activities of the paramedics ii
Annex 2: Paramedic’s knowledge Questionnaire iv
Annex 3: Paramedic’s knowledge Rating Questionnaire Score vi
Annex 4: Paramedic’s skills Rating Questionnaire Score vii
Annex 5: Household Survey Questionnaire viii

List of tables

Table 1: Age distribution of the paramedical staff 56
Table 2: Basic qualification of the paramedics 5
5
6
Table3: Paramedics’s knowledge about early case detection 57
Table 4: Paramedics’s knowledge about leprosy classification 57
Table 5: Paramedics’s knowledge about types of reactions 58
Table 6: Paramedics’s knowledge about treatment of reactions 58
occupation

Table 36: The practice of the study population when a family member gets leprosy 74
Table 37: Knowledge and awareness about the disease among the study population 75
Table 38: Relationship between the degree of awareness and level of education among the study population 76
Table 39: Relationship between the degree of awareness and occupation 77
Table 40: Distribution of the study population according to the degree of awareness about the transmission of the disease 78
Table 41: Relationship between the degree of awareness about the transmission about the disease and occupation 79
Table 42: Relationship between the degree of awareness about leprosy transmission and level of education 62
Table 43: Relationship between the degree of awareness and the experience of participation among the study population 63

List of figures

Figure 1: Age distribution of the paramedics 82
Figure 2: Basic qualification of the paramedics

Figure 3: Distribution of the patients according to type of leprosy

Figure 4: Gender distribution of the patients

Figure 5: Distribution of the study population according to occupation

Figure 6: The practice of the study population in relation to treatment when a family member get leprosy

Figure 7: Distribution of the study population according to the degree of awareness about the transmission of the disease

Figure 8: Relationship between the degree of awareness and the experience of participation among the study population

List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>PB</td>
<td>Paucibacillary leprosy</td>
</tr>
<tr>
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<td>Abbreviation</td>
<td>Full Form</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------</td>
</tr>
<tr>
<td>MDT</td>
<td>Multidrug Therapy</td>
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<td>GO</td>
<td>Disability Grade zero</td>
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<td>Disability Grade two</td>
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<td>NLCP</td>
<td>National Leprosy Control Programme</td>
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<td>WHO</td>
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<td>M. leprae</td>
<td>Mycobacterium leprae</td>
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<td>AMDT</td>
<td>Accompanied Multidrug Therapy</td>
</tr>
</tbody>
</table>

**List of Key Words**

- Early case detection.
- Leprosy classification.
- Multidrug therapy
- Disability Prevention.
- Community mobilization.
CHAPTER II

MATERIAL AND METHODS
2.1 General outline;

This study is conducted to compare the role of the paramedical staff in leprosy control program in South and West Kordofan Zone before and after training in 1995. The study focused on the knowledge, skills and practice of the paramedical staff. The study was carried out during the period between Jan 1995 and Dec 1997.

2.2 Study design;

This is a pre and post quasi experimental study design comparing the role of the paramedical staff in leprosy control programme before and after training.

2.3 Study area;

South and West Kordofan zone was chosen for the study because leprosy is a known endemic disease in the zone. South and West Kordofan zone is characterized by lack of qualified medical doctors and the inadequate health infrastructure. The study area is located in the South Western part of Sudan. Administratively it is divided into 5 provinces: Kadugli, Al Dalanj, Rashad, Abujbeha and Abie Province. The total population according to 1993 census is 1685000. The zone is generally a mountainous area in four provinces and sandy in
the 5th one (Abie Province). It is located in the zone of Rich Savanna with a long rainy season which extends from June to November with a peak in August and September. This area is characterized by the low socioeconomic standard of life and political unrest. Farming and animal raising are the major income generating activities. The nomadic tribes move seasonally to search for water and pasture. Another characteristic of the area is the very high illiteracy rate, most of the people believe in taboos and the health seeking behavior is predominantly traditional.

Leprosy work in the zone started in early 1940s when voluntary agencies built a leprosarium in Abri village to cater for approximately 2000 patients in Kadugli Province. By the late 1940s a total of four leprosaria was achieved. Satellite dispensaries were established in the early 1950s to serve patients who lived far from the leprosarium.\textsuperscript{56}

Between 1950s and 1984, the leprosy service in the region used dapsone monotherapy as a strategy for control.\textsuperscript{1} The introduction of MDT for treatment of leprosy in the region started in 1985.\textsuperscript{6} The estimated prevalence of leprosy in the zone was 10-14 per 10 000 population.\textsuperscript{57} There was a 83.9\% reduction in registered cases following MDT implementation to only 596 cases in December 1992.\textsuperscript{57} Despite the drastic fall in prevalence, the new case detection averages 193 cases, and DGII proportion among new cases remain high (91.5\%).\textsuperscript{57} During the period between 1970s and 1988 leprosy services were conducted through a
vertical programme with one Medical Assistant acting as a supervisor under direct supervision of the director of the health services in the area and one or two paramedics in each leprosy-service facility.\textsuperscript{56} During the period between 1989 and 1991, the leprosy control service was almost collapsed due to the civil war started in the area. The leprosaria were closed and the patients migrated to more secure areas around the cities in the zone.\textsuperscript{56} The integration of leprosy control into the existing general primary health care facilities in the zone started in 1991 when Benevolence International Organization was invited to support the field control services. 86 out-lets were opened in the existing primary health care facilities to conduct the control activities. but insecurity and political unrest have hampered the programme.\textsuperscript{7} The training activities were lagging behind. The paramedics in these clinics did not receive in service training. They were getting their experience either from the supervisor of the zone, or from general practitioners working in the zone’s hospitals.\textsuperscript{7} The leprosy control activities were only confined to the clinics.\textsuperscript{7}

2.4 Study population and Sampling:

The study population comprises the following:

- Seventy leprosy clinics in South and West Kordofan zone.
- Selection of the paramedical staff.
All the available relevant records at the selected leprosy clinics in the zone.

All the patients detected during the period between Jan 1992 to Dec 1997.

All the available household leaders (care takers) during the post training period of the study.

The multistage sampling technique was taken as follows;

2.4.1 Selection of the health care facilities:

Seventy out of 86 health centers and dispensaries conducting leprosy control activities were selected by simple random sampling. Fourteen clinics were chosen from each province (2 health centers and 12 dispensaries). The same seventy facilities were included in pre and post intervention study sample.

2.4.2 Selection of the paramedical staff:

Seventy paramedics who were in charge of the control program in the selected facilities were chosen and trained. Pre training assessment of their knowledge and skills as regards leprosy control was done. They received intensive training on leprosy basic concepts with especial emphasis on; early case detection, clinical classification, treatment chemotherapy, disability grading, prevention and community mobilization. Modified WHO training manuals were used. The training courses were conducted in 1995.

2.4.3 Selection of the patients;
A total of 839 newly diagnosed leprosy cases were included in the study, 239 of them were diagnosed before the training of the paramedics in Jan 1995, while the remainder (546 cases) were diagnosed after training i.e. all patients under the supervision of the paramedical staff were included in the study.

2.4.3 Selection of the households;
All the households in the zone were considered for the selection for the purpose of the household survey. The study unit was the head of the household at the time of the interview visit during the post training period. The sample size was calculated from the formula:

\[ n = \frac{z^2 pq}{d^2} \]

As the disease under the study is a common health problem, the confidence level (z) was taken as 95% and the degree of precision was considered to be equal to 0.05. if P is taken as 0.5 then q will be equal to 0.5. Considering the technique (multistage sampling) the design effect was taken as 2, the sample size (n) was calculated and was found to be 360. Their knowledge, awareness and practice in the control program were assessed.

2.5; Data collection tools;
The following methods were used for data collection during the pre and post intervention periods;

2.5.1. Check list of the health facility records.
2.5.2 Clinical examination of the patients.

2.5.3 The surveys;

Two surveys were carried out during the study periods. The first survey was conducted to collect data as regard to paramedical staff knowledge, skills and practice. The other one was concerned with the community awareness about the disease and the community participation in its control:

2.5.3.1 Paramedical staff survey;

The paramedics who were in charge of the leprosy clinics were the study population of this survey. The paramedic was the study unit. A precoded pretested questionnaire was scored by the author; the allocation was >60% to those of good knowledge (know) and < 60% were considered of bad knowledge. The skills of the paramedics were observed by the author in the pre and post training period to assess the competence of the paramedics in conducting the activities, those scored >60% were considered as satisfactory and the score <60 % was considered as not satisfactory (Annex 4). The activities of the paramedics were observed by the author and compared before and after training (Annex 1).

2.5.3.2 Household survey;

Data were collected by interviewing the head of the household (male or female ) at the time of the study by using pretested and precoded questionnaire . The questionnaire composed of 13 questions to collect
data dealing with their awareness about leprosy diagnosis transmission, treatment and other aspects of the disease, in addition to their participation in its control (Annex 5). The survey was conducted after training by a team of two interviewers and one well experienced medical assistant acting as a supervisor.

2.6 Data analysis;

Data collected by check list and self administered questionnaire were analyzed manually. Household survey data were analyzed by microcomputer using SPSS/PC software. The study protocol was followed uniformly in all the centers. The results were analyzed by Chi-Square test. The level of significance was taken at 0.05.

Steps followed in proper case management;

The training manual was predominantly based on WHO training manual. The major items of training manual were;

1- The case detection;

The diagnosis was based on very simple highly specific clinical signs;¹ long standing dry insensitive skin patch, enlarged peripheral nerves

2- Leprosy classification;

The classification of leprosy was according to WHO guidelines:¹

- Paucibacillary cases; The number of both skin patches and enlarged peripheral nerves should not exceed five.
- Multibacillary cases; The number of both skin patches and enlarged peripheral nerves exceed five.

3- Disability grading;
Disability grading was carried out according to WHO guidelines;¹

❖ Disability grade 0 (DG 0);
- No (anesthesia, visible deformity or damage in hands and feet).
- No (evidence of visual disturbance or eye problems due to leprosy).

❖ Disability grade 1 (DG 1);
- Anasthesia present but no visible deformity or damage in hands, or feet.
- Eye problems due to leprosy are present; Corneal anesthesia, Lagophthalmos, Iridiocyclitis, vision is 6/60 or better, the patient can count fingers at 6 meters.

❖ Disability grade 2 (DG 11);
- Visible deformity or damage is present in hands or feet.
- Severe visual impairment; the patient can count fingers at 6 meters.

4- Diagnosis of reactions;
Diagnosis of reactions was carried out according to WHO guidelines;¹

❖ diagnosis of reversal reaction type 1 in PB and MB leprosy was carried by one or more of the following signs;
- Painful, tender peripheral nerves.
- Signs of nerve damage; loss of sensation and muscle weakness.
- Fever and malaise.
- Rarely new skin lesions may appear.
- Type 11 reaction; only in MB cases; the main features are;
  - Tender, reddish skin nodules.
  - Fever, joint pain and swollen nerves.
  - Eye involvement may occur (iridocyclitis) giving pain, redness and watering of the eyes.

5- Treatment by multi drug therapy (MDT);

This was according to WHO guidelines;¹

- PB leprosy; Rifampicin and Dapsone for 6 months.
- MB leprosy; Rifampicin, Dapsone and Clofazimine for 24 months.

6. Treatment of reactions:

This was according to WHO guidelines;¹

- By aspirin, prednisolone and rest.
- Referral of the case after failure of treatment for 4 months
  “If still there is pain, tenderness and muscle weakness”.

7. Treatment of disabilities:

This was according to WHO guidelines;¹

- Early detection, regularity in treatment.
- DGI: by prednisolone and patient self care.
- DGII: Patient self care. Care and Antibiotics for the infected areas and rehabilitation.

CHAPTER III

RESULTS
Chapter three ; results

The results obtained for the purpose of the study during the period between Jan 1992 and Dec 1997 will be presented under the following headings;

3.1 Knowledge, skills and practice of the paramedical staff at the leprosy clinics level as regard to leprosy control activities.

3.2 Community awareness concerning the disease and community participation in the control process

3.1 Knowledge, skills and practice of the paramedical staff;

The results obtained about the knowledge, skills and practice of the paramedical staff at the level of leprosy clinics about proper case management in connection to leprosy control program in South and West Kordofan zone will be presented as follows;

3.1.1 Background information about the study population;

Complete data were obtained from 70 paramedics their age distribution is shown in (table 1, fig 1). The total number of the study population was 70 paramedics. This represents the paramedics who were in charge of leprosy control in 70 clinics. Seven of the participants were females
The majority of the study population were above 41 years of age (58.8%). (table 2, fig 2) show the basic qualification of the paramedical staff. Eleven of the participants were Medical Assistances (15.71%). The majority of the study population were nurses (62.86%), while the remainder 15 were community health workers (21.43%). None of the paramedics received in-service training before 1995. The data were taken before and after training and then compared, assessed by rating questionnaire score. (Annex 1 & 2).

3.1.2 Knowledge of the paramedics;

The results regarding leprosy control in connection to the objectives of the study were compared as pre and post intervention design and shown as follows:

Concerning the knowledge of the paramedics regarding early diagnosis of leprosy; 48 out of them (68.6%) know to diagnose early leprosy by insensitive skin patches and enlarged peripheral nerves before training, 67 out of them (95.7%) know how to diagnose leprosy after training. The difference is statistically significant Chi-Square = 17.45, P = 0.00002 (table 3).

As regard to the knowledge of the paramedics about the classification of leprosy; 45 out of them (64.3%) know to classify leprosy by clinical signs before training, 65 out of them (92.9%) know to classify leprosy
after training. The difference is statistically significant Chi-Square = 16.85, \( P = 0.00004 \) (table 4).

The score of the knowledge of the paramedics as regard to the types of leprosy reactions showed that; 13 out of them (18.57%) know the two types of leprosy reactions before training, 55 out of them (78.57%) know the types of reactions after training. The difference is statistically significant Chi-Square = 50.08, \( P = 0.0000 \) (table 5).

Only 11 of the paramedics (15.71%) know that the treatment of leprosy reactions is by Prednisolone, Asprin and bed rest before training, 48 out of them (68.57%) know that after training. The difference is statistically significant Chi-Square = 39.82, \( P = 0.0000 \) (table 6).

As regard to the knowledge of the paramedics about the duration of the treatment of PB leprosy; only 25 out of them (35.71%) know the correct duration, 63 out of them (90%) know that after training. The difference is statistically significant. Chi-Square = 43.86, \( P = 0.0000 \) (table 7).

Concerning the knowledge of the paramedics about the duration of the treatment of MP leprosy; 28 out of them (40%) know the duration of the treatment before training, 67 out of them (95.7%) know the duration after training. The difference is statistically significant. Chi-Square = 49.45, \( P = 0.0000 \) (table 8).

Only 18 of the paramedics (25.71%) know to classify the disability into G0, G1, G2 before training, 43 out of them (61.43%) know the grading
after training. The difference is statistically significant. Chi-Square = 18.03, P = 0.00002. (table 9).

Concerning the knowledge of the paramedics regarding the meaning of DG1; only 15 out of them (21.43%) know the correct answer before training, 57 out of them (81.43%) know the correct answer after training. The difference is statistically significant. Chi-Square = 5.08, P = 0.0000. (table 10).

Concerning the knowledge of the paramedics regarding the meaning of DG2; 21 out of them (30%) know the correct answer before training, 57 out of them (81.43%) know the correct answer after training. The difference is statistically significant. Chi-Square = 37.25, P = 0.0000. (table 11).

Only 14 of the paramedics (20%) know how to prevent occurrence of disabilities before training, 65 out of them (92.86%) know that after training. The difference is statistically significant. Chi-Square = 75.63, P = 0.0000 (table 12).

3.1.3 Skills of the paramedics;

The skills of the paramedics were observed by the author before and after training using a checklist. (Annex 4) The results were as follows;

Scoring the skills of the paramedics as regard to the proper diagnosis of leprosy showed that; 21 out of them (32.86%) were satisfactory for recognition of early signs of leprosy before training, 46 out of them
were satisfactory after training. The difference is statistically significant Chi-Square = 13.83, P = 0.00002. (table 13). The same results were obtained before and after training as regard to their skills concerning proper clinical classification of leprosy (table 14).

Only 14 out of the paramedics (20%) were scored as satisfactory to grade the disability correctly before training, 59 out of them (84.30%) were satisfactory to do that after training. The difference is statistically significant Chi-Square = 55.42, P = 0.0000. (table 15).

Concerning the skills of the paramedics as regard to giving proper instructions on MDT regimen; only 21 out of them (30%) were scored as satisfactory before training, 52 out of them (74.29%) were satisfactory after training. The difference is statistically significant Chi-Square = 25.76, P = 0.00004. (table 16). The same results were obtained before and after training as regard to their skills concerning the proper instructions upon completion of the prescribed dose. (table 17).

As regard to the skills of the paramedics concerning the proper instructions on patient self care; only 18 out of them (25.71%) were scored as satisfactory before training, 51 out of them (72.86%) were satisfactory after training. The difference is statistically significant Chi-Square = 29.26, P = 0.00001. (table 18).

Concerning the score of the paramedics as regard to their skills of making patients stay on treatment until completion of the prescribed dose; only 17
out of them (24.29 %) were scored as satisfactory before training, 51 out of them (72.86%) were satisfactory after training. The difference is statistically significant Chi-Square = 31.14,  P=0.0000. (table 19).

Only 9 out of the paramedics (12.86%) were scored as satisfactory to diagnose leprosy reactions before training, 39 out of them (55.7%) were satisfactory after training. The difference is statistically significant Chi-Square = 26.66,  P = 0.00002. (table 20).

As regard to the skills of the paramedics concerning their ability to make proper treatment of reactions; only 7 out of them (10 %) were scored as satisfactory before training, 36 out of them (51.43%) were satisfactory after training. The difference is statistically significant Chi-Square=26.32 ,  P= 0.00003. (table 21).

Concerning the score of the paramedics as regard to their skills of discussing the basics about leprosy in the clinic; 22 out of them(31.43%) were scored as satisfactory before training, 38 out of them (54.29%) were satisfactory after training . The difference is statistically significant Chi-Square = 7.47 ,  P= 0.006. (table 22).

Only 8 out of the paramedics (11.43 %) were scored as satisfactory to discuss the basic facts about leprosy in the community before training, 38 out of them (54.29 %) were satisfactory after training. The difference is statistically significant Chi-Square = 28.93,  P = 0.0001. (table 23).

3.1.4 The practice of the paramedics;
The practice of the paramedics was measured in proper case management. The results were compared as pre and post intervention design and shown as follows:

3.1.4.1. **Background information about the patients;**

The total number of the study population was 839 leprosy patients. 776 out of them were MB cases (92.5%), the remainder 63 cases (7.5%) were PB leprosy cases (table 24, fig 3). This represents the patients who were identified by the paramedical staff under the study during the period between Jan 1992 and Dec 1997. 613 out of them (73%) were males, the remainder 226 (27%) were females. Male to female ratio was 2.7 : 1. (table 25, fig 4)

As regard to the practice of the paramedics concerning the early case detection; The training was effective in improving the early case detection from 128 leprosy cases (43.69%) before training to 312 cases (57.14%) after training. The difference was statistically significant; Chi square test was 13.84. $P = 0.0001$. As shown in (table 26).

Concerning the activities of the paramedics as regard to classification of leprosy; the paramedics were able to classify 81 leprosy cases out of 293 leprosy cases (27.65%) before training, 327 cases (59.89%) were classified after training. The difference is statistically significant. Chi-Square = 79.27, $P = 0.0000$. (table 27).
As regard to the practice of the paramedics concerning compliance with treatment; 129 out of 293 cases (44.03%) were on regular treatment before training, 369 out of 546 cases (67.58%) were on regular treatment after training. Chi square: 43.8, P= 0.0000 (table 28).

Concerning the impact of training on the behaviour of the patients as regard to completeness of treatment; 115 out of the expected patients (39.25%) were completed their treatment before training, 355 out of them (65.02%) completed their recommended treatment after training chi square = 51.33, P= 0.0000. (table 29).

As regard to tracing of the absentees; out of 22 absentees (40.9%) were traced and resume the treatment before training, 14 out of 17 absentees (82.3%) were traced and resume their treatment after training chi-square = 6.63, P = 0001. (table 30).

Concerning the activities of the paramedics as regard to the grading of disabilities; 113 cases out of 312 disabled leprosy cases (36.22 %) were graded correctly before training, 124 cases (58.22 %) were graded correctly after training. The difference is statistically significant. Chi-square = 24.69 , P = 0.0001. (table 31).
As regard to the activities of the paramedics concerning the disability prevention; 38 out of 213 disabled patients (17.8%) developed further disabilities before training, 25 out of 312 patients (8%) developed further disabilities after training. The difference is statistically significant. Chi-Square = 11.56, P = 0.0006 (table 32).

Concerning the activities of the paramedics as regard to the treatment and referral of reactions; 12 cases out of 31 leprosy reaction cases (40.7%) were treated by the paramedics before training, 36 reaction cases (83.7%) were treated by the paramedics after training. The difference is statistically significant. Chi-Square = 4.69, P = 0.00003 (table 33).

3.1.4.2. **Community awareness concerning the disease and community participation in the control process;**

3.1.4.2.1. **Background information of the participants;**

360 household leaders (care takers) were interviewed. 123 out of them (23.3%) were illiterate and the majority 223 (61.9%) were farmers. (Table 34, 35, fig5).

3.1.4.2.2. **Knowledge and awareness about the disease;**

According to the survey, leprosy came at the top of the disabling diseases in urban and rural areas. 349 (96.8%) out of the households under the study perceived leprosy as a serious community problem.
They gave various reasons for that and 249 out of them (69.2%) answered that leprosy will prevent patients from the effective work, 360 (100%) answered that it will make the patient disabled, and 111 (30.8%) stated that it will dissociate the sufferer from the community. Among the study population 100% knew leprosy by disabilities, 268 (74.4%) knew leprosy by skin patches. Concerning the treatment of the disease, 261 (72.5%) of the participants stated that they notified in the area to see the patient, 73 (20.2%) took the patient to the leprosy clinic.

Scoring to the study population awareness according to their knowledge and practice about the disease reflected that (70.1%) out of them were highly aware as regard to early signs, The importance of seeking early diagnosis and treatment and the necessity of completion of the prescribed dose. However, the relationship between the degree of awareness and the level of education was statistically significant, Chi square=27.24, P=0.0024 (Table 38), but it was statistically not significant with the occupation, Chi square= 9.319, P= 0.03396, (table 39).

3.1.4.2.3. Knowledge and awareness about the transmission of the disease;

The awareness of the study population as regard to the transmission of the disease from ill to healthy was tested. 267 (74.1%) perceived bacteria as a main cause of the disease. More over, 328 out of them (91.1%)
knew that leprosy is transmitted from ill to healthy individuals. The study population were scored to three categories (Highly aware, partially aware, not aware) according to their knowledge about the transmission. These include: the transmission of the disease from ill to healthy, the role of bacteria and route of entry. The majority of them 328 (91.1%) were highly aware (table 40). However, the relationship between the degree of awareness, occupation was statistically not significant Chi square = 9.031, P = 0.3396 (table 41), but it was highly significant with the level of education. Chi square = 27.241, P = 0.0024 (table 42, fig 7).

3.1.4.2.4. Knowledge and practice of the participants concerning participation in control activities:

The survey about the participation of the household leaders as an essential component of the control program showed that; 253 out of them (70.1%) reported recent participation within the last three years which took the form that required from them. The relationship between the participation and the degree of awareness is significant. The participation in 3 years between 1995 and 1997; took the form of health education, directing the suspects to the leprosy clinics and supervising the medicines of the illiterate patients in the remote areas Chi square = 2.431, P = 0.03658 (table 43, fig 6, 8).
CHAPTER IV:

DISCUSSION, CONCLUSION, RECOMMENDATIONS AND REFERENCES
4.1. Discussion

**An overview**

The results obtained for the purpose of this study will be discussed under the following headings:

4.1.1. Knowledge, skills and practice of the paramedical staff about leprosy control programme.

4.1.2. Community awareness and participation.

4.1.1. Knowledge, skills and practice of the paramedical staff about leprosy control programme:

4.1.1.1. Case-Finding;
One of the important strategies of the National Leprosy Control Programme to achieve the goal elimination of leprosy was; to increase case finding to bring undiagnosed cases existing in the community under treatment by promoting passive case finding methods, and expansion of MDT coverage to all areas of the country through integrating the service into the existing general health services facilities. However, the change from vertical programme to an integrated one is expected to be faced by many obstacles. One of the major obstacles is inadequately trained paramedical staff and their questionable competence in conducting the related leprosy control activities. The situation in South and West Kordofan was facing the same obstacles. In addition, it was implemented in a peculiar political and administrative considerations. It was stated that, the success of integration can only be ensured when the general health services assume ownership of leprosy services and gain competence in diagnosis, treatment and management of leprosy complications. However, training can help to provide solutions to many health care delivery problems, but training alone will not eliminate them. Defects in the health services that are the result of inadequate budgets, poor supervision, or an unreliable system for the provision of essential supplies, for example, will not be corrected by retraining of the staff at the periphery of the service. Each of these elements is essential if leprosy work is to be successfully integrated into the general health services. However, the training in our case, was found to be effective in improving the paramedic's diagnostic efficiency and accuracy in classification of leprosy in South and West Kordofan leprosy control programme. The same role was reported by Nagarajo and Gubti. This has significantly increased the number of early detected leprosy cases. Comparing the number of new cases detected during the pre
training period and post training period a significant increase was observed. This is remarkable, since as a result of improvement of the knowledge, skills and practice of the paramedics to diagnose leprosy cases many patients are expected to be diagnosed during the post training period. More than that, the availability of MDT in all leprosy clinics in the zone, or an increase in the community awareness may be contributing factors for a successful early detection of the undiagnosed leprosy cases existing in the community. During the post training period, almost three times the detected number of patients during the pre training period was found. In fact these figures stress the need for sustained leprosy control efforts, they also highlight the fact that many patients specially in the remote areas were not reached by the limited health education activities available during the intervention period. They underline the need for better coverage of the community by health education activities and for more expansion of the sustainable leprosy services, and thus for integration of leprosy control within the primary health care facilities. The training of the paramedical staff was not only used for, detection of new leprosy cases, but also as a part of integrating leprosy control services into the primary health care facilities.

4.1.1.2. Case- Holding and chemotherapy:

The National Leprosy Control Programme stressed that; in order to promote treatment compliance and completion, MDT is to be ensured in the general health services facilities, proper health education is to be provided to every patient coming in for care from the first day of treatment about the importance of regular treatment, the defaulters should be followed up passively and resume back their treatment, and the Health workers are also to trace defaulters when ever they are in that particular village for delivery of other health services. In our case, it is found that, the paramedics are capable to; discuss the basic facts about leprosy conduct proper instructions upon completion of treatment, convince the patient about the importance of regularity in medications and making them trust his /her decision, and to make patient stay on treatment until the completion of the recommended dose through health education according to WHO and national guidelines. Moreover, (51.43%) The majority of the paramedics were found to be capable to treat cases of reactions following the WHO guidelines. The same important role of the paramedics was highlighted by Dewapura. It is of paramount importance to mention that only (10%) of the paramedics were able before training to treat reactions in the field, compared to (51.43%) after training, indicating that more strengthening of the training component regarding treatment of reactions is needed. The figures about the practice of the paramedics, reveal that, a case-holding is successful, the patients were regular in attending the
supervised monthly doses. In fact a higher proportion of MB cases completed treatment, and those who
were not expected to complete their doses in 1997, were receiving their treatment regularly, they will
be transferred to the registers of 1998, and MB cases who will complete 12 doses will be released from
treatment according the new instructions of WHO regarding shortening of MDT of MB cases from 24
months to 12 months. Moreover, 40.9% of the absentees before training and 82.3% after training
dropped their treatment (4 - 6 months) they were considered as absentees, traced by the paramedics,
reassessed, resumed the treatment showing strong agreement with WHO which stated that if the patient
is unable to complete the required number of doses in time, for any reason; the treatment regimen
should be continued from where it was left off, and the full course completed, the regimen should not
be started from the beginning. These patients did not considered defaulters because “The patient will
be considered a defaulter only when he or she has not collected the treatment for successive 12 months,
and once the patient has been categorized as a defaulter, this patient should be removed from the
registers. The results of the absentees tracing, indicates that, the paramedics can manage the absentees
problems properly and they are reliable for that. In Brazil and Madagascar; It is found that, the
proportion of patients not able to complete their treatment for various reasons ranges from (5 - 20%) at
national level, in some specific situations and Limited areas, this proportion has been found to be as
high as 65%. In Pakistan, ‘30% out of 18,000 known leprosy patients have dropped out of their
treatment programs; the causes found to be that; many patients were denying the disease before
complaining, many patients had initially consulted traditional healers, inadequate trained physicians
and/or untrained medical practitioners for treatment of their symptoms, which resulted in lengthy
delays before they were correctly diagnosed. Further even after the diagnosis was made and appropriate
medications were not usually warned in advance the possibility of occurrence of the common side
effects of their disease (leprosy) medications. Which led to further compliance problems”.
Relating these facts to our case, it is found that : the paramedical staff were able to conduct health education
about leprosy, side effects of medications and importance of regularity in treatment, this was given in
advance before starting the regimen, hence no patients dropped out their treatment during both periods
so as to be considered as defaulters. However, what was discovered by evaluation of the role of the
paramedics in case-holding is almost as stated by NLCP with regards to the components of the policy.

4.1.1.3. Disability Prevention;

WHO, stated that, the best way to prevent disabilities is early diagnosis
and prompt treatment with MDT. The objective of disability prevention
have been laid down by the NLCP is to establish a programme for
disability prevention to reduce the incidence of new physical impairment
of eyes, hands and feet at least an average of 5% annually. The essential
components of the national disability prevention strategy are; training of
paramedical workers for disability prevention especially physiotherapy
training, provision of support materials for management of disabled
patients, provision of foot wear for patients who are in need health
The disability prevention policy in the South and West Kordofan was the product of the national strategy. The results obtained as regard to the paramedic’s practice for disability prevention; it is revealed that; the paramedical staff succeeded to promote the awareness of the patients, changed their attitudes, so they came voluntarily seeking for medical advice to get rid of their problem. Although of the high rate of disability DG II among the newly diagnosed cases (62.6 %), which is mainly related to the high social stigma, the paramedical staff succeeded to; raise the awareness of the community, detect new early cases of leprosy having no disabilities, to give them adequate and prompt MDT and to keep them free of disabilities. More than that they succeeded to minimize the development of further disabilities among already disabled patients.

The improvement in prevention of disabilities was achieved mainly due to the fact that: health education during the pre training period was mainly given monthly to the patients and their families during the scheduled monthly appointments, during the post training period; this was continuing, plus the field health education to the general public and involvement of the community leaders about the problems of disabilities.

The paramedical staff were concentrating to promote the change in the patients behavior with regard to specific activities in their daily lives:-
For life long care of eyes with loss of led strength or loss of sensations; the patients advised to avoid dryness of eyes & injuries, daily inspection for eye problems & care. b. Hands, feet: with long standing disability: All day avoidance of injuries by using shoes, or goggles, routine daily inspection for any problems and care, daily skin care (soaking in water, oiling, rubbing off hard skin, daily simple exercise (to keep ms, supply, joints mobile), Consultation of the health staff if any problem, according to guidelines.¹

* The problem of D G II is not common in South Kordofan only, but all over the globe where that; about 2 million people are visibly and irreversibly disabled; their problem will persist long after the bacteria within their bodies have been killed.

However, what was revealed by evaluation of the role of the paramedics in disability prevention is more or less as stated by NLCP and WHO with regards to the purposes and components.

4.1.2. Community awareness and participation;

One of the essential elements of the Global Strategy for the elimination of leprosy, as stated by WHO, is to promote awareness in the community about leprosy so that individuals with suspicious lesions will report voluntarily for diagnosis and treatment.¹ The following activities are recommended by WHO to help in early reporting of the patients; Informing the community about the signs and symptoms of leprosy, strongly stressing that it is a curable disease and encouraging patients to seek treatment without delay. Informing about locations and timing of available services. Informing about the availability of free treatment. Informing that starting treatment without delay will prevent disabilities. Requesting the local community leaders, teachers, religious authorities and traditional medical practitioners to participate in health education activities. Using the local newspapers/radio/TV to inform about leprosy. Organizing special campaigns.¹ The NLCP decided to train community leaders, teachers and NGOs to participate in case finding, compliance with treatment and social support activities in areas where leprosy known to be highly endemic.¹ Bearing this in mind a community-based survey was carried out during December 1997 in South and West Kordofan to assess the role of the paramedical staff as regard to community mobilization towards leprosy problem.

The majority of the participants (96.8%) perceived leprosy as a serious community problem and also perceived bacteria as a main cause of the disease (74.1%). Moreover their awareness about, transmission, early signs of the disease, importance of early diagnosis, regularity in treatment and completion of treatment, the disease seriousness and its relation to the disabilities is also high. So this high perception and knowledge about the disease, importance of early diagnosis and treatment is a good foundation for participation and the same time reflecting the effective role of the paramedics in raising the awareness of the community.

Concerning the practice among the study population with regard to participation in the control programme, the majority of them (67.5%) reported recent participation within the last 3 years. They were sharing in spread the message about leprosy control, advising the suspects to seek for early medical advice. Moreover, they were supervising the treatment of the nearby illiterate patients specially in the remote areas where the accessibility to paramedics is difficult.
Almost there were no activities to mobilize the community during the pre training period. The health education was mainly confined to the patients and their families when they were coming to collect the MDT blister packs from the paramedics, while it was including general public talks, meetings with the community leaders during the post training period. The community awareness about leprosy in general was raised, the attitudes of the people towards leprosy were changed, and the patients were encouraged to seek treatment without delay. So that the early case detection increased from (43.69%) before training to (57.14%) after training due to the successful role of the paramedics in mobilizing the community towards leprosy problem. Ahmed KM and Al Tahir MS in the year 1995 reflected also a similar important role of the village leaders in promoting leprosy control activities demonstrated in Alangasana Hills, Blue Nile state. The village leaders were found to be very helpful in bringing the suspects to the health teams, plus supervising the treatment of the patients during the rainy seasons.  

However, what was concluded by studying the role of the paramedics in South and West Kordofan with regard to raising the community mobilization towards leprosy is almost as stated with WHO and NLCP relating to purposes and components.
4.2. Conclusion :

1- The training is found to be very effective in raising the level of the knowledge, skills and practice of the paramedics.

2- Knowledge and skills of the paramedics with regards to management of cases with reactions need more strengthening.

3- The paramedics are reliable to conduct leprosy control activities and to mobilize the community towards leprosy problems.
4- The participation of the community members in the program is important and effective.
4.3 Recommendations:

1. Training is to be generalized to all paramedical staff (Nurses, medical assistants and community health workers) working in the general primary health care facilities for the purpose of integration of leprosy control in all the areas where leprosy is a community health problem.

2. Continuous training is very important for more improvement in the performance of the paramedics.

3. Components of training with regards to diagnosis and management of leprosy reactions should be intensified.

4. Further expansion of the health education activities is needed to detect and manage all hidden leprosy cases.
4.4. References:


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References For Community Mobilization:
