

## TRAINING OF NON-PHYSICIAN PRACTITIONERS TO IDENTIFY AND REFER DIABETIC PATIENTS

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### ABSTRACT

*Objectives:* To improve the practices of non-physician practitioners on early diagnosis and referral of patients with diabetes mellitus. Study will be conducted in a peri-urban village community in Lahore, Pakistan, during 2007 – 2008.

*Method:* Quasi – experimental study, one group before and after design was used to document the effect of training of non-physician practitioners on improving their diabetic patient identification practices and referral to the hospital for diagnostic and treatment facilities. Fasting Blood glucose test was used to identify hyperglycaemics out of those referred by the NPPs.

*Results:* Patient referral was increased by 48.44% after training. Identification of hyperglycaemic patients on the basis of signs and symptoms was 47% before and 48% after training and the difference between two proportions was not significant.

*Conclusion:* Increased number of referrals showed motivation of NPPs towards the task however more prolonged and structured training program is required to utilize their services in community as part of our health care delivery system.

*Key words:* Non-physician practitioners, training of NPPs, hyperglycemia.

### INTRODUCTION

The number of people with diabetes, worldwide, in the year 2000 – is 171 million, which will increase to at least 366 million by 2030. Greater increase in diabetes will occur in developing countries, due to population growth, ageing, unhealthy diets, obesity and sedentary lifestyles, and that there is a growing incidence of Type 2 diabetes – which accounts for about 90% of all cases – at a younger age. In developed countries most people with diabetes are above the age of retirement. Middle, productive years of their lives, aged between 35 and 64 is mostly affected in developing countries. Pakistan is one of the top ten sufferers (India, China, USA, Indonesia, Japan, Pakistan, Russia, Brazil Italy and Bangladesh).<sup>1</sup> In 2006 International Diabetes Federation (IDF) published new data indicating the enormity of the diabetes epidemic. The Federation's Diabetes Atlas shows that the disease now affects 246 million people worldwide, with 46% of affected are in the 40 – 59 age group. The number will rise to 380 million within 20 years if nothing done.<sup>2</sup> Many studies show on an average an overall prevalence of diabetes as 2.5% in rural females of Pakistan, while in urban females it is 3.5%. Among rural males it is 3.3% while in urban it is 6% which is quiet high.<sup>3-7</sup>

Inequities in access to health care are also a major concern in the United States. Many communities lack sufficient numbers of primary care clinicians.<sup>8</sup>

In 2004 the Joint Learning Initiative (JLI) published a document on *Human Resources for Health Overcoming the Crisis*. In 2006 World Health organization (WHO) published World Health Report, which estimates that more than 4 million health workers will be needed to fill the huge gap between need and availability, including 2.4 million physicians, nurses and midwives.<sup>9,10</sup> Family physicians, nurse practitioners, and physician assistants are especially likely to practice in rural communities at grass root level, as shown by few researches<sup>3,11,12</sup> and might be more likely to care for low – income patients.<sup>13-15</sup>

The present study aimed at improving the practices of non-physician practitioners on early diagnosis and referral of patients with diabetes mellitus. The specific objectives were:

1. To train a selected group, non-physician practitioners to;
  - a. Recognise the symptoms and signs of diabetes mellitus.

- b. To refer suspected patients to qualified health professionals for evaluation and management.
2. To improve the detection rate and referral of patients with diabetes mellitus.

### MATERIAL AND METHODS

A peri-urban community of Lakhodair, covered by a Community Outreach Program offered by a not-for-profit tertiary care teaching hospital in District Lahore is the study area. Study subjects include all eligible non-physicians practitioners belonging to the study area who consented for participating in the study. The study design is quasi-experimental. Total 44 NPPs consented for the study so a single group was formed and within group, pre and post intervention assessment was done. List of all NPP in the selected area was made and all eligible NPPs who consented were enrolled in the study which was 44 in number. Written informed consent was taken and the ethical review for the study was done by the Institutional Review Board.

Data collection was carried out in 3 phases. The phase 1 consisted of 8 weeks (2 months) in which identification and listing of Non-Physician Practitioners, baseline / Pre-intervention survey of the participating NPPs and training of NPPs was conducted. In this study NPPs are defined as practitioners with formal and non-formal medical (paramedic, nurses, LHWs), homeopathic, traditional medicine (unani or ayurvedic) training/qualifications, who are consulted by the people of the community for the treatment of their illnesses. The Baseline / Pre-intervention survey of the enrolled NPPs was conducted by a team comprising of the 4 members supervised by two medical officers of the Department of Medicine after taking informed consent. Information was collected on a semi-structured questionnaire. The participants were encouraged to send diabetic suspects to the designated laboratory for fasting blood sugar testing. After 2 months of referral before training the NPPs were trained.

Training of the NPPs was performed regarding identification of diabetes coming to their clinics for consultation, referring the diabetic patients coming to their clinics for consultation, counseling diabetic patients to get their treatment from the referral hospital, keeping the record of the diabetic patients, providing feedback reports to the Research Core Group. Training was conducted on a pre-developed training module.

Recording and monitoring of the referrals from the trained NPPs was done by the health centers and in the department of medicine. Blood samples were taken at the centre and were transported to the central lab at the hospital, with all necessary mea-

asures to maintain quality standards. Those with positive test were referred to the department of medicine outpatient department for more detailed evaluation. Referred patients found to have health problems other than diabetes mellitus, were managed appropriately at the health centre level or where required referred to the hospital. They were treated as other social welfare patients in the hospital. After phase 2 of 8 weeks, re-training was given and referrals for another 8 weeks were allowed. Patients were asked to give fasting blood sugar samples, blood sugar cut off value was taken as more than or equal to 110 mg/dl and in case of random blood sugar the cut off value was taken as  $\geq 180$  mg/dl.

*Ethical Clearance:* Ethical clearance was obtained from local institutional ethical committee.

*Written Informed consent* was obtained from the study subjects.

### RESULTS

Fortyfour Non-physician practitioners were enrolled in the study, out of these 12 (27.3%) were of the age group less than 30 years, 30 (4.5%) were in the age group from 30 – 50 years and 02 (68.2%) were > 50 years of age. Mean age of NPPs was 34.64 with SD of  $\pm 8.026$  and range of 18 to 55 years. Male NPPs were 15 (34.1%) while females were 29 (65.9%). According to profession among male NPPs, 11 (73.3%) were dispensers, 4 (26.7%) held DHMS diploma in homeopathy, whereas among female NPPs, 1 (34.4%) was dispenser, 28 (96.6%) were Lady Health Workers. By looking at the qualification we found 10 (22.7%) were below matric, 16 (36.4%) were matric, 13 (29.54%) were intermediate / F.A, 4 (9.1%) were graduate, and 1 (2.3%) held postgraduate degree, whereas none of the enrolled NPPs was illiterate. Qualification of female NPPs shows among 29 female NPPs 10 (34.5%) were below matric, 13 (44.8%) matric, 3 (10.3%) were intermediate / F.A, 3 (10.3%) were graduates, none held postgraduate degree and none of the enrolled female NPPs was illiterate.

Additional diploma / certificate was acquired by 46.67% NPPs of which none was female. No NPP was currently enrolled for one or other diploma / certificate courses relevant to their profession. Twenty-nine (66%) NPPs were permanent residents of the study area, while 15 (34%) belonged to other nearby areas and had their clinics in the study area Lakhodair.

Professional experience of NPPs showed a mean of  $8.68 \pm 7.306$  and range of 14 years to 40 years. NPPs having experience of less than 5 years were 14 (31.8%), 15 (34.1%) had an experience of 5 – 10 years, 15 (34.1%) had an experience of more than 10 years.

Upon asking about the number of patients seen

daily on an average, 13(29.5%) see less than 5 patients / day, 12 (27.3%) see 5 – 10, 6 (13.6%) NPPs see 10 – 15 and 13 (29.5%) see more than 15 patients per day on an average. Mean of patients seen daily was  $18.27 \pm 31.61$  with a range of 5 to 250.

Patients above the age of 15 years seen per day by NPPs show an average of  $18.27 \pm 31.61$  with a range of 2 to 200.

Sore throat, sinusitis, flu, malaria, hypertension and diabetes were most commonly reported communicable and non-communicable diseases among adult patients seen by them. A total of 38 (88.4%) NPPs a total of refer their patients to other practitioners for consultation or advice and these patients commonly suffer from tuberculosis, chronic diseases (diabetes, hypertension) or its complications. A total of 43 (97.7%) NPPs also refer their patients to hospitals or health care centre for consultation or advice, referral is usually made to Services Hospital Lahore. Patients with elevated blood sugar (diabetes) were frequently seen by 43 (97.7%) NPPs, during their practice, 34 (77.3%) NPPs do see patients with one or more complications of diabetes mellitus. Forty three (97.7%) NPPs were interested in knowing more about high blood sugar level while 1 (2.3%) showed no interest. NPPs were interested in knowing more about sugar / diabetes presenting complaints or symptoms, diagnostic tests available and new knowledge about diabetes.

A total of 279 patients were referred to our lab for assessment of blood sugar level. These patients were assessed and clinically examined by NPPs, based on their clinical judgment and understanding of sign and symptoms of diabetes. The mean age of patients came out to be  $48.69 \pm 10.258$ ,  $t = 77.118$  (95% C.I 47.44 – 49.93).

During Pre-training phase of the study that was 2 months of duration, patient referral by NPPs was 59 patients, it was 21.1% of total referral in December 2007 and January 2008. After training of the NPPs in Post-training Phase the referral was 220 patients, that was 78.9% of total referrals made during the study. Blood sugar results of the referred patients showed that of 279 samples 148 were normoglycaemic and 131 hyperglycaemic.

The training was given to all the 44 NPPs but only 28 NPPs refer patients for blood sample testing in post training phase. Total referral made by these 28 NPPs is 225 patients, of which 58 (25.78%) in pre-training phase and 167 (74.22%) in post-training phase. The increase in patient referral is 48.44%. In pre-training phase proportion of hyperglycaemics was 0.48 (28 / 58) or 48%, whereas in post-training phase it is 0.47 (80 / 167) or 47%. Statistical analysis showed that the difference between two proportions of hyperglycaemics is not significant.

Table 1: *The socio-demographic characteristics of NPPs and their relationship with patient referral in pre and post training phases.*

NPP factors	Referral (Patient blood sample referral)		
	Pre-training Phase	Post-training Phase	Total
<i>Age</i>			
< 30	13 (18.30%)	58 (81.70%)	71
> 30	45 (29.23%)	109 (70.77%)	154
P value	0.04		
<i>Education</i>			
Matric & >	56 (25.57%)	163 (74.42%)	219
< Matric	02 (33.33%)	04 (66.67%)	06
P value	0.96 (Yates corrected)		
<i>Professional experience</i>			
< 10 years	23 (20.90%)	87 (79.09%)	110
>= 10 years	35 (30.43%)	80 (69.56%)	115
P value	0.051		
Grand total	58	167	225

The socio-demographic characteristics of NPPs and their relationship with patient referral in pre and post training phases is shown in table 1. The socio-demographic characteristics of NPPs and their relationship with proportion of hyperglycaemics in pre and post training phases is shown in table 2.

**DISCUSSION**

A large number of Pakistani population prefers to consult non-physician practitioners working at grass root level especially in rural areas and urban slums for medical advice. A study based on Pakistan National Health survey data 1990 – 94 shows the overall prevalence of medical care seekers in the past two weeks as 24.5% and the proportion of Paramedics as a first choice for seeking medical care was 0.20 (SE 0.020).<sup>16</sup>

The document on Human Resources for Health: Overcoming the crisis by the Joint Learning Initiative (JLI) and 2006 World Health Report estimates the huge gap in availability and demand of health human resource.<sup>9,10</sup> This shows the need for training and equipping of non-physician practitioners who firstly usually belong to the area and secondly are working at grass root level and thirdly they are more familiar with the socio – cultural background of the local community and communicate with them in a proper and convincing way.

Table 2: *The socio-demographic characteristics of NPPs and their relationship with proportion of hyperglycaemics in pre and post-training phases.*

NPP factors	Identification (Proportion of Hyperglycaemic) (Blood samples with Blood sugar level $\geq$ the cut off value)		
	Pre-training Phase (total referrals 58)	Post-training Phase (total referrals 167)	Difference between two proportions
<i>Age</i>			
< 30	07 (53.8%)*	30 (51.7%)	0.8899
> 30	21 (46.7%)	50 (45.9%)	0.9282
<i>Education</i>			
Matric and >	27 (48.2%)	78 (47.9%)	0.9627
< Matric	01 (50%)	02 (50%)	0.3865
<i>Professional experience</i>			
< = 10 years	12 (52.2%)	44 (50.6%)	0.8915
>10 years	16 (45.7%)	36 (45%)	0.9435

\*Percentage of total referrals

A study conducted on primary care physicians shows that a large number of non-physician primary care practitioners are serving the poor and underserved.<sup>17</sup> This study showed an increase in the number of referrals suspected to have diabetes on history and clinical signs and symptoms after training of non-physician practitioners in new diabetic patient identification. The present study was based on the hypothesis that training can improve the skills and competency of non-physician practitioners like nurses, lady health workers, alternate medicine practitioners etc. The results showed no effect of training in improving clinical diagnosis of diabetic patients but significant effect in improving patient number referred for screening. The unavoidable reality is that we do not have enough doctors to sustain traditional working patterns. Therefore, developing new professional roles seems a logical response. The government needs to widen career opportunities in health care and to develop a flexible training structure based on individual competences. Increasing numbers of medically unqualified practitioners are now being trained in surgery related practice, and this is a good time to examine the pros and cons of their training.<sup>18</sup>

Surgical care practitioner programs have been developed describing their curriculum, training and employment details, which can be done for non-physician practitioners including nurses, lady health workers, dispensers, hakims, homeopaths etc. As we are expanding our health care system but due the shortage of trained doctors / physicians the need for primary – care physicians is becoming greater than ever.

Quantity, quality and frequency of training can be improved and more structured hand on opportunity using case scenarios and real patients can be provided to NPPs so they can have a better understanding of the sign and symptoms of diabetes and develop clinical skills.

It is *concluded* that increased number of referrals showed motivation of NPPs towards the task however more prolonged and structured training program is required to utilize their services in community as part of our health care delivery system. The NPPs training at grass root level should be more patient centered using mock patients, scenarios and hands on in hospital outdoor and also ensuring periodicity of these structured trainings.

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