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Original Article

Evaluation of Physical Impairment and Psychosocial Disorders in New Leprosy Patients before and after Multidrug Therapy in a Referral Hospital in Belo Horizonte, Minas Gerais, Brazil: The Value of Rating Scales in the Assessment of Disabilities

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This study aimed at assessing the ability of rating scales to reflect changes in leprosy-related disabilities in new patients at the time of diagnosis and completion of multidrug therapy (MDT), to evaluate the association between physical disabilities and psychosocial disorders in such patients and to identify the factors associated with high impairment scores. The study population comprised of 56 new leprosy patients. Physical disabilities were evaluated by means of Maximum WHO Impairment Grade (IG) and Eye-Hand-Foot (EHF) impairment scores, while psychomotor and social disorders were evaluated using Screening of Activity Limitation and Self Awareness (SALSA), Green Pastures Activity Scale (GPAS), Participation, Hamilton depression and Jacoby stigma scales. The SALSA and Hamilton scales were the most efficient in reflecting changes in the status of patients after completion of MDT. Depression and activity limitations increased the probabilities of high IG

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and EHF scores by 6.39- and 5.61-times, respectively. Age and education were significantly associated with poor disability scores. It is sufficient to apply the IG scale alone in the routine of basic health units. The SALSA and an adapted version of the Hamilton depression scale should be introduced to assess psychosocial disorders in leprosy cases. Educational approaches addressed to older and less educated patients should be implemented. The significant concordance between the scores obtained with the SALSA, GPAS, Participation, Hamilton depression and Jacoby stigma scales at the time of diagnosis and at completion of MDT suggests that all of these tools provide consistent evaluation of the physical impairments and psychosocial disorders associated with leprosy.

Keywords : Prospective study, Hansen´s disease, Leprosy-related disabilities

Introduction

Leprosy is a chronic disease which, if not treated appropriately, can lead to physical impairments and psychosocial disorders (Spierings et al 2000, Gonçalves et al 2008). Assessment of the disabilities caused by this condition is of the utmost importance in formulating an effective intervention tailored to the needs of patients. Heretofore, public health authorities prioritized the diagnosis and treatment of leprosy in order to reduce the number of cases. However, the development of multidrug therapy (MDT) has enhanced significantly the effectiveness of treatment and the cure of patients, and health professionals have redirected their attention to the rehabilitation of the physical, psychological and social disabilities that persist even after eradication of the causative bacillus *Mycobacterium leprae*.

In routine practice, evaluation of physical disabilities is performed through the application of the World Health Organization (WHO) Maximum Impairment Grade (IG; WHO, 1988) and the Eye-Hand-Foot (EHF) impairment sum score (de Rijk et al 1994) as recommended by WHO and the Brazilian Ministry of Health (Ministério da Saude do Brasil 2008). Such tools are, however, limited to physical disabilities and do not reflect the well-being and mental health of the patients. For this reason, a number of other instruments have been developed to enable the assessment of psychosocial limitations together with physical impairments, and these include the Screening of Activity Limitation and Safety Awareness (SALSA) scale (SALSA Collaborative Study Group et al 2007), the Green Pastures Activity Scale (GPAS; van Brakel et al 1999) and the Participation scale (van Brakel et al 2006). Furthermore, two additional measures, namely the Hamilton and Jacoby scales (Hamilton 1960, Baker et al 2000), are available for evaluating, respectively, the impact of depression and perceived stigma on quality of life, and these could have application in the appraisal of leprosy-induced disabilities. However, while the SALSA and Participation rating scales comprise standardized and internationally validated questionnaires that can be applied by trained health professionals to individuals with leprosy-induced disabilities, the GPAS, Hamilton and Jacoby scales have not yet been ratified for leprosy patients in a Brazilian setting.

Leprosy is prevalent in Brazil and 21 other high-burden countries, including Angola, Congo, Ethiopia, India, Nepal and Bangladesh (WHO 2016), where the disease is widespread in poor areas and patients remain untreated in some despite massive government campaigns. In view of the epidemiological importance of leprosy and the requirement of assessing the rehabilitation needs of leprosy patients, we set out to test the

hypothesis that MDT provides only a partial solution to the problem of leprosy-related disabilities and that other approaches should be used in order to cater for the psychosocial limitations of patients. Hence, the aims of the present study were: (i) to assess the abilities of the SALSA, GPAS, Participation, Hamilton depression and Jacoby stigma scales to reflect changes in leprosy-related disabilities in new patients at diagnosis and after completion of MDT, (ii) to evaluate the associations between physical disabilities, as assessed by IG and EHF scores, and psychosocial disorders in such patients, and (iii) to identify the factors associated with high IG and EHF scores.

Materials and Methods

The investigation was approved by the Ethical Committee of the Hospital Eduardo de Menezes (Protocol no. 0034.0.203.000-10), administered by Fundação Hospitalar do Estado de Minas Gerais, Belo Horizonte, MG, Brazil. The objectives of the study were explained to all subjects and those who agreed to participate in the survey were invited to sign the written informed consent. All procedures were conducted according to the principles of the Declaration of Helsinki.

Study population : This descriptive, cross-sectional epidemiological study involved 56 new leprosy patients who had received treatment at the Serviço de Dermatologia Sanitária in the Hospital Eduardo de Menezes, Fundação Hospitalar do Estado de Minas Gerais, during the period January 2009 and October 2010. The study population was selected among patients who had been admitted directly to the Hospital Eduardo de Menezes or referred from other institutes or hospitals within the region. The exclusion criteria were children aged less than 10 years, patients who had already received treatment for the condition at the commencement of the investigation, and subjects presenting speech, hearing or cognition impairment. The required sample size was calculated on the basis of a previous pilot study involving 15 individuals and considered a confidence level of 95% ($\alpha = 0.05$) and a power of 80% ($\beta = 0.20$).

Data collection : Socio-demographic and clinical data of the patients were obtained from medical records maintained at the Hospital Eduardo de Menezes (primary source) and from the notification forms provided by the Sistema Nacional de Agravos e Notificação (secondary source; Ministério da Saúde do Brasil 2007).

Disease-related disabilities were evaluated at the time of diagnosis and at the completion of MDT through application of IG and EHF forms provided by the Brazilian Ministry of Health together with a validated Portuguese translation of the SALSA scale and a Portuguese version of the GPAS scale, the translation of which had been verified by a native English-speaking author (LL). Portuguese versions of the Participation, Hamilton depression and Jacoby stigma scales (the last mentioned instrument having been translated by the authors) were employed to evaluate psychosocial disorders. All scales were applied by trained health professionals including the first author SHLM (medical doctor) as well as a physiotherapist, an occupational therapist, an ophthalmologist and a psychologist.

Data were digitalized using Epi data software version 3.1 for Windows (Epi data Association, Odense, Denmark) and subsequently processed using SPSS software version 17.0 for Windows (SPSS Inc., Chicago, IL, USA).

Statistical analyses : The characteristics of patients at the time of diagnosis and at the completion of MDT were compared using the McNemar test (nominal categorical variables),

the marginal homogeneity test (ordinal categorical variables) or the Wilcoxon test (non-parametric numerical variables). The factors associated with the evolution of patients were analyzed using the Pearson χ^2 test and the Fisher exact test (categorical variables) or the Mann-Whitney test (non-parametric numerical variables). Univariate analysis was performed using the Fisher exact test (categorical variables) or the Kruskall-Wallis test (non-parametric numerical variables) in order to evaluate factors associated with IG and EHF scores. In the multivariate analysis, the ordinal response variables were analyzed using the proportional odds model (McCullagh 1980). Initially, all variables presenting $p \leq 0.25$ in the univariate analysis were included in the multivariate analysis, while the criterion for inclusion in the final model was $p \leq 0.05$. The odds ratio (OR) was estimated for each co variable and an estimate of the OR value for all of the compared categories was obtained according to the premise of proportional odds premise, an assumption that was tested for all variables individually and for the final model. The goodness of fit of the final model was evaluated using the McCullagh deviance test (McCullagh 1985). A 5% significance level was adopted in all analyses unless otherwise stated.

Results

The socio demographic and clinical characteristics of the study population collected at the time of diagnosis have been reported in full in a previous publication (Moura et al 2017) and are summarized below. Most of the participants were male (57.1%), aged between 31 and 60 years (62.5%), married (53.5%) and with a low level of education (≤ primary schooling) (66.0%), while the vast majority resided in urban environments (94.6%) (Table 1). The most common forms of the disease (92.8%) identified within the study

Table 1 : Selected sociodemographic and clinical characteristics of new leprosy patients (N = 56) assisted at the Hospital Eduardo de Menezes, Belo Horizonte, MG, Brazil, during the period January 2009 to October 2010.

Sociodemographic parameter	n (%)	Clinical parameter	n (%)
Age		Bacilloscopy	
10 -15	6 (10.6)	Negative	30 (53.5)
16 - 20	3 (5.4)	Positive	23 (41.1)
21 - 30	4 (7.2)	Not specified	3 (5.4)
31 - 40	19 (34.0)		
41 - 50	4 (7.2)	Reaction episodes	
51 - 60	12 (21.3)	Absent	17 (30.4)
61 - 70	7 (12.5)	Type 1	25 (44.6)
71 - 80	1 (1.8)	Type 2	14 (25)
Education			
Illiterate	5 (8.9)		
Primary schooling	32 (57.1)		
Secondary schooling	7 (12.5)		
University	2 (3.6)		
Not specified	10 (17.9)		

population were borderline and borderline lepromatous, while 94.6% of the subjects exhibited multibacillary (MB) leprosy and were considered highly contagious. Among the study patients, 44.6% reported type 1acute reaction episodes and 25% reported type 2 reactions. Nearly all of the patients (96.4%) were submitted to MDT/MB or an alternative therapy, as recommended by the Brazilian Ministry of Health (Ministério da Saúde do Brasil 2005) even though many of them (53.5%) were bacilloscopy-negative.

There was significant ($p \leq 0.044$) concordance between the results obtained using all of the rating tools (i.e. SALSA, GPAS, Participation, Hamilton depression and Jacoby stigma scales) applied at the time of diagnosis and at the completion of MDT (Table 2). However, marginal homogeneity analysis revealed some statistically significant changes in the physical and psychosocial conditions of patients between the time of diagnosis and the culmination of treatment (Table 3). Thus, although the differences in the overall SALSA scores obtained at the two evaluation times were not statistically significant, the results acquired at the completion of MDT relating to the specific questions "do you wash your whole body?" and "do you cut your finger or toenails?" varied significantly ($p \leq 0.009$) from

Table 2 : Comparison of the degree of concordance between the results of rating scales applied at the time of diagnosis and completion of multi-drug therapy (MDT) to new leprosy patients assisted at the Hospital Eduardo de Menezes, Belo Horizonte, MG, Brazil during the period January 2009 to October 2010.

Rating scale	At time of diagnosis		At completion of MDT	
	p value	Kappa value	*p* value	Kappa value
Concordance with SALSA[a]				
GPAS[c]	< 0.001[b]	0.678	< 0.001[b]	0.696
Participation	0.009[b]	0.291	< 0.001[c]	0.513
Jacoby stigma	0.008[b]	0.340	0.044[b]	0.269
Hamilton depression	< 0.001[b]	0.412	< 0.001[b]	0.444
Concordance with GPAS[d]				
Participation	0.002[b]	0.343	< 0.001[c]	0.457
Jacoby stigma	0.013[b]	0.313	0.007[b]	0.358
Hamilton depression	< 0.001[b]	0.508	< 0.001[b]	0.508
Concordance with Participation				
Jacoby stigma	0.003[c]	0.407	0.010[c]	0.312
Hamilton depression	0.026[c]	0.164	0.029[c]	0.217
Concordance with Jacoby stigma				
Hamilton depression	0.001[c]	0.295	0.009[b]	0.333

[a] Screening of Activity Limitation and Safety Awareness.

[b] Concordance according to the Pearson χ^2 test.

[c] Concordance according to the Fisher exact test.

[d] Green Pastures Activity Scale.

Table 3 : Marginal homogeneity analysis of the results of rating scales applied at the time of diagnosis and completion of multi-drug therapy (MDT) to new leprosy patients assisted at the Hospital Eduardo de Menezes, Belo Horizonte, MG, Brazil during the period January 2009 to October 2010.

Rating scale	Final score	Categorical variable[a]	
		***p* value**	***p* value**
SALSA[b]	0.289	6.Do you wash your whole body?	0.009
		7. Do you cut your finger or toenails?	0.004
GPAS[c]	0.250	A. Walking	0.029
		D. Preparing meals	0.016
		E. Activities in the house	0.008
Participation	0.593	4. Travel to other places	0.031
		17. Comfortable meeting new people	0.034
Jacoby stigma	0.908	Not applicable (NA)	NA
Hamilton depression	0.008	5. Insomnia middle	0.019
		6. Insomnia late	0.003
		7. Work and activities	0.011
		11. Somatic anxiety	0.006
		14. Genital symptoms	0.002
		15. Hypochondriasis	0.006
		16. Loss of weight	0.011
		19. Depersonalization and derealization	0.048

[a] The categorical variables are accompanied by their respective number/letters as in the original scale. Only the results relating to the final scores of the scales and categorical variables with $p < 0.05$ are shown.

[b] Screening of Activity Limitation and Safety Awareness.

[c] Green Pastures Activity Scale.

those procured at the time of diagnosis. In a similar manner, the overall GPAS scores presented no significant differences between the two evaluation times, but the responses regarding “walking”, “preparing meals” and “activities in the house” improved significantly ($p \leq 0.029$) after treatment.

With respect to possible changes in the psychosocial conditions of patients, the overall scores obtained using the Jacoby stigma scale at the time of diagnosis and at the completion of MDT were not significantly different and no changes in the specific attitudes of patients could be detected (Table 3). Similarly, the overall Participation scores were not significantly different at the two evaluation times but the responses regarding “travel to other places” and “comfortable meeting new people” were significantly ($p \leq 0.034$) improved after treatment. In complete contrast, the overall scores of the Hamilton depression scale obtained at the two evaluation times were significantly ($p=0.008$) different, while the responses to eight of the 21 specific questions showed significant ($p \leq 0.048$) improvements at the completion of treatment.

Table 4 : Results of univariate analysis of the factors associated with physical disabilities in leprosy patients (N = 56) assisted at the Hospital Eduardo de Menezes, Belo Horizonte, MG, Brazil during the period January 2009 to October 2010.

Factor	IG score[a] *p* value	EHF score[b] *p* value
Sociodemographic variable		
Age	0.019[c]	0.058[c]
Education	0.013[c]	0.016[c]
Clinical variable		
Type 2 reaction	0.375[c]	0.006[c]
Bacilloscopy	0.193[d]	0.003[d]
Rating scale		
SALSA[e]	0.015[c]	0.006[c]
GPAS[f]	0.037[c]	0.064[c]
Hamilton depression	0.047[c]	0.091[c]

[a] Impairment grade.
[b] Eye-Hand-Foot.
[c] Correlation according to the Fisher exact test.
[d] Correlation according to the Kruskall-Wallis test.
[e] Screening of Activity Limitation and Safety Awareness.
[f] Green Pastures Activity Scale.

Table 5 : Results of the multivariate analysis (proportional odds model) of the factors associated with physical disabilities in leprosy patients (N = 56) assisted at the Hospital Eduardo de Menezes, Belo Horizonte, MG, Brazil during the period January 2009 to October 2010.

Rating scale and associated factors	*p* value	Odds ratio (min - max)	95% CI[a]
Impairment grade (IG) score[b]			
Education (>primary schooling)	0.012	0.05	0.01 - 0.53
Depression as determined by the Hamilton	0.015	6.39	1.44 - 28.42
depression scale (mild to severe)			
Eye-Hand-Foot (EHF) score[c]			
Education (>primary schooling)	0.015	0.05	0.01 - 0.56
Impairment as determined by the SALSA[d] scale	0.006	5.61	1.64 - 19.27
(mild to severe)			

[a] Confidence interval.
[b] Goodness of fit according to deviance test: p= 0.227.
[c] Goodness of fit according to deviance test: p = 0.767.
[d] Screening of Activity Limitation and Safety Awareness.

Univariate analysis revealed significant ($p \leq 0.019$) associations between overall IG scores and the variables education and age (Table 4). With respect to overall EHF scores, association with the variable education was significant (p=0.016) but there was only a tendency of association with the variable age (p=0.058). Type 2 reactions and bacilloscopy were identified as factors significantly (p<0.006) associated with EHF score but not with IG score. Additionally, SALSA, GPAS and Hamilton depression scale scores were associated significantly ($p \leq 0.047$) with IG score, and SALSA score was associated significantly (p = 0.006) with EHF score.

Multivariate analysis confirmed that the variable education was a significant ($p \leq 0.015$) risk factor for high IG and EHF scores (Table 5) with individuals who had received instruction at secondary school or above being 95% less likely to present high IG and EHF scores (OR=0.05%). The mental status of patients figured as a significant (p=0.015) risk factor for high IG scores in that mild /severely depressed individuals (as determined by the Hamilton scale) showed a 6.39 - fold increase in the probability of presenting elevated IG scores. Similarly, activity limitation, as determined by the SALSA scale, was significantly (p=0.006) associated with EHF score, i.e. patients exhibiting limitations in activities of normal daily life were 5.61-times more likely to produce high EHF scores.

Discussion

The significant concordance between the scores obtained with the SALSA, GPAS, Participation, Hamilton depression and Jacoby stigma scales at the time of diagnosis and at completion of MDT suggests that all of these tools provide consistent evaluation of the physical impairments and psychosocial disorders associated with leprosy. However, the SALSA scale suggested that the independence and self-esteem of patients had improved after treatment, while the GPAS scale indicated progress in the rehabilitation of patients in the period between initial diagnosis and culmination of treatment. The ability to walk, prepare meals and perform everyday tasks around the house depends on the capacity to use the upper and lower limbs and is, thus, associated with independence of movement. The Participation scale revealed some significant improvements between the time of diagnosis and completion of MDT regarding attitudes to travel and social interaction. Additionally, the Hamilton depression scale exposed significant changes in the mental status of patients after treatment. The more optimistic perspective exhibited by members of the study population indicated a progress in self-confidence and self-respect (self-esteem) and the ability to cope with the challenges of social life.

In contrast to the above, the Jacoby stigma scale indicated no progress in the rehabilitation of patients between the time of diagnosis and the completion of MDT. Stigma is very difficult to measure because it can be experienced as explicit or perceived exclusion or discrimination. In an investigation conducted in Nepal, Brouwers et al (2011) found that perceived stigma was significantly higher among people with leprosy-related disabilities (grades 1 and 2) in comparison with healthy controls. Moreover, studies performed in Bangladesh, Yemen, Ethiopia and Trinidad and Tobago revealed that stigma towards leprosy was much greater than that associated with other stigmatizing conditions including unusual skin diseases, epilepsy and tuberculosis (Suite and Gittens 1992, Tekle-Haimanot et al 1992, Al-Qubati and al-Kubati 1997, Croft and Croft 1999, Tsutsumi et al 2004). Indeed, even health professionals in Botswana displayed negative attitudes towards leprosy patients, mainly beca-

use of disinformation regarding the disease (Kumaresan and Maganu 1994a). Certainly, stigma negatively influences the behavior of individuals suffering from leprosy in that they generally try to avoid contact with other people and evade medical help (Raj et al 1981, Elissen 1991, Kumaresan and Maganu 1994b, Tsutsumi et al 2004).

Various possibilities may be put forward to explain the inability of the Jacoby stigma scale to detect treatment-related changes in the present study. It may be that the tool lacks sensitivity, as suggested previously by Van Brakel et al (2012) following a study performed in Indonesia. Although the questionnaire comprises only three subjective queries (Baker et al 2000), the interview process is complex and the outcome may be affected by the diverse personalities of the patients and their emotional reactions to stigma. Moreover, stigma is largely influenced by the socio-cultural environment of the sufferer. In this context, the Jacoby scale was originally developed to evaluate patients with epilepsy in a European setting. In Brazil, leprosy is known as Hansen's disease, a term that is certainly less stigmatizing, implies a more temporary condition, and does not necessarily label the patient as a function of the disease.

Univariate analysis verified that the variable age was associated with physical impairment, as determined by IG and EHF scores, since the frequency of individuals with visible disabilities or reduced sensitivity was higher in the older groups. Such association was as expected since leprosy is essentially an adult disease, by reason of the protracted incubation period of *M. leprae* (Corrêa et al 2012) and physical limitations resulting from diverse causes are common in older subjects.

Univariate and multivariate analyses revealed significant associations between education and IG and EHF scores, indicating that physical impairment is correlated with lack of self-care and disease perception. Individuals with higher levels of education (> primary schooling) are more likely to understand the importance of cultivating self-care and seeking medical help early on, and such members of the study group exhibited 95% less chance of gaining high IG and EHF scores. Epidemiological studies have shown that a low level or absence of education is associated with the emergence of leprosy, the development of more severe forms of the disease, and with non-adherence to MDT. Most experts agree that education moderates behavior towards leprosy and other neglected diseases, and that these topics should be discussed within the school environment (Raj et al 1981, Elissen 1991, Kumaresan and Maganu 1994b).

According to univariate analysis, type 2 reactions and bacilloscopy were significantly associated with high EHF scores. Type 2 reactions are characterized by painful and tender red papules or nodules on the skin (erythema nodosum leprosum) and accompanied by systemic symptoms such as fever, joint pain, edema and malaise. Such episodes occural most exclusively in patients with MB leprosy, especially those classified as borderline lepromatous (Orlova et al 2013) and MB patients comprised the majority of the study population, 25% of which presented type 2 reactions.

Univariate analysis revealed significant associations between the SALSA, GPAS and Hamilton depression scales with high IG scores, while the first of these tools was also significantly associated with high EHF scores. Significant and strong correlations of the SALSA scale with EHF score and the Hamilton depression scale with IG score were confirmed in the multivariate analysis. This implies that the well-being and mental status of a considerable proportion of the patients was badly

affected by the loss of sensitivity, deformities and physical constraints caused by the disease.

Van Brakel et al (2012) employed the SALSA, Participation and Jacoby stigma scales, among others, to show that 77% of subjects with leprosy-related disabilities had physical impairments and that their status deteriorated significantly after release from treatment. Additionally, slightly less than two-thirds of patients reported limitations in activity and social participation while just over one-third experienced anticipated stigma.

Through application of the Bengali version of the Center for Epidemiologic Studies Depression scale (CES-D), Tutsumi et al (2004) were able to show that the levels of depression of 140 leprosy patients in Bangladesh were significantly higher than those of 135 local subjects without chronic diseases. Furthermore, the depressive status of those who answered affirmatively to questions relating to the perception of stigma was elevated significantly. The CES-D scale is similar to the Hamilton depression scale in that it is a validated instrument, with well-established reproducibility, that aims to measure the main components of depression, namely cognitive, physiological and behavioral. In concordance with the present results obtained through application of the Hamilton depression scale, Tutsumi et al (2004) reported that the CES-D depression score increased with the aggravation of disabilities (increased IG), although the total CES-D median score of the group of patients who answered affirmatively to questions relating to the perception of stigma was greater than that obtained in our study.

Psychiatric disorders are encountered more frequently in leprosy patients than in the general population or in subjects with other medical conditions (Kumar and Verghese 1980, Weiss et al 1992, Tutsumi et al 2004, Erinfolami and Adeyemi 2009). The stigma and discrimination suffered by leprosy patients impacts on their mental health making them feel desperate and abandoned, so that a high percentage verbalize suicidal ideas and some actually carry out the plan (Behere 1981, Tutsumi et al 2004, Kisivul et al 2005). Our study has shown that leprosy patients exhibiting symptoms of depression had a 6.39 times higher probability of presenting elevated impairment scores, although it was not possible to determine cause and effect, i.e. whether depression augmented the physical incapacities and deformities or vice-versa.

This article is very timely and will be useful to managers of health services responsible for the eradication of leprosy in the 22 top priority countries, who will be required to implement the "Global Leprosy Strategy 2016-2020" (WHO 2016), as well as public health officers and experts who provide technical assistance, monitoring and evaluation of the program. The Global Leprosy Strategy 2016-2020 emphasizes the quality of leprosy services as essential for an effective health programme, defining quality services through eight main topics including "addressing each aspect of case management based on solid scientific evidence (diagnosis, treatment, prevention of disability, rehabilitation, psychological and economical support)". In this context the value of scales presented and studied herein ought to be taken into consideration to reflect changes in leprosy-related disabilities.

Conclusions

Based on the results presented herein we conclude that: (i) it is sufficient to apply the IG scale alone in the routine of basic health units since this tool has the advantages of being simple, rapid and able to provide the same amount of information as the more detailed EHF score;

(ii) along with the determination of physical disabilities, it is important to evaluate the well-being and mental health of leprosy patients during the process of rehabilitation and in our opinion the SALSA scale is the most adequate tool for this purpose; (iii) the Hamilton depression scale, which is currently difficult to administer and draws on the experience of the interviewer, should be adapted for leprosy sufferers and validated for routine application by health care's since use of this tool would contribute to the identification of depressive behavior and prevent the aggravation of leprosy-related disabilities; (iv) MDT represents only a partial treatment of disease-related disabilities and additional strategies should be implemented including educational approaches directed to leprosy sufferers, particularly to older and less educated patients, with the aim of improving self-care, overcoming stigma and depression, and increasing social participation; (v) specialized referral hospitals should organize psychiatric assistance for patients with leprosy-related disabilities to help them overcome their physical and psychosocial limitations and to improve their quality of life. Our work represents an important step towards a change in the methods and practices used in Brazil for the rehabilitation of people with leprosy. In a country, with so many disparities and contrasts, where the prevalence rate of leprosy varies between 0.13 to 9.03 cases per 10,000 inhabitants, the challenge of eliminating the disease is likely to continue for many years.

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