

## **Test-Retest Reliability of the Screening Activity Limitation and Safety Awareness (SALSA) Scale in North-West Nigeria**

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### *Summary*

*Introduction* The present study examines the inter-tester and intra-tester reliability of the recently developed scale for Screening of Activity Limitation and Safety Awareness (SALSA) in North-West Nigeria. The scale was developed through collaborative research in five countries around the world.

*Methodology* One hundred and three people affected by leprosy from three states in North-West Nigeria participated in the study. A Hausa translation of the 20-item SALSA questionnaire was used by four trained health staff to interview the participants. Seventy-five paired interviews were conducted where the second interview was administered by a different interviewer from the first at intervals of 4–76 days (median 52). Twenty-eight paired interviews were conducted, both by the same interviewer, at intervals of 52–71 days (median 63).

*Results* Inter-tester reliability: All 20 items had Kappa's ranging from 0.45–0.8; 15 items had Kappa's >0.6; 8 items had Kappa's >0.7. Intra-tester reliability: All 20 items had Kappa's ranging from 0.51–1; 15 items had Kappa's >0.6; 12 items had Kappa's >0.7. For inter-tester reliability, the first interview had a mean SALSA score of 36.5 (95%CI = 34.96–38.05). The second interview had a mean of 35.02 (95%CI = 35.01–37.99). For intra-tester reliability, the mean SALSA scores of first and second interviews were 27.36 (95%CI = 24.36–30.36) and 26.68 (95%CI = 23.93–29.43), respectively.

*Conclusions* The Hausa translation of SALSA has an acceptable reliability in Nigeria provided the interviewers are well trained.

### **Introduction**

It is not only the body and mind that are affected by diseases and health conditions. Especially in chronic, disabling conditions like leprosy, activities of daily living and key social areas such as relationships and employment are also affected.

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The World Health Organization International Classification of Functioning, Disability and Health (ICF) defines impairments as problems in body function or structure such as a significant deviation or loss; activity limitations as difficulties an individual may have in executing activities, and participation restrictions as problems an individual may experience in involvement in life situations.<sup>1</sup>

Tools for assessing impairments in people affected by leprosy have existed for many years. However, tools for measuring activity limitations and participation restrictions in people affected by leprosy have only recently been developed.<sup>2,3</sup>

This study examines the inter-tester and intra-tester reliability of the recently developed scale for Screening of Activity Limitation and Safety Awareness (SALSA) in North-West Nigeria. The scale was developed through collaborative research in five countries around the world. The development of the scale has already been reported by the SALSA Collaborative Study Group.<sup>2</sup>

## Materials and Methods

### STUDY AREA

This test-retest reliability study took place in Niger, Kebbi and Sokoto States in North-West Nigeria.

### STUDY POPULATION

One hundred and thirteen people affected by leprosy from three states in North-West Nigeria participated in the study. Some of them were still taking multi-drug therapy (MDT), but 85% were released from treatment (Table 1).

Many lived in leprosy settlements. Those attending the MDT clinics were asked if they would participate. Investigators visited villages where previously treatment patients resided and invited them to participate in the study.

**Table 1.** Calculation of Kappa (k) for Question 5: Do you walk longer distances?

SALSA score 1st interview	SALSA score 2nd interview					Total
	0	1	2	3	4	
0	0	0	0	0	0	0
1	0	33	0	0	1	34
2	0	0	11	0	0	11
3	0	3	1	6	2	12
4	0	2	1	0	15	18
Total	0	38	13	6	18	75
Observed agreement	86%					
Chance agreement	32.5%					
Kappa	0.8023					
Standard error	0.0582					
95% Confidence interval	0.6883–0.9164					

#### EXCLUSION CRITERIA

Volunteers under 15 years of age were excluded to ensure full compliance with the questionnaire which is designed for adults. Volunteers over 70 years of age were also excluded as it was felt that age could account for much of their activity limitation, rendering the questionnaire inappropriate. Clients with Hearing/speech impairments were excluded because the questionnaire is administered through interview.

#### TRAINING OF INTERVIEWERS

The training of the research assistants took place over 2 days. The training included an introduction to the concept of activity limitation and its relevance to leprosy. The development of the SALSA scale since the year 2000 was summarised. The aim of the third phase, the Inter and Intra–tester reliability testing was explained.

We reviewed the important elements of communication and interview skills. Using role play we demonstrated bad and good interviews and asked the trainees to observe and make comments.

We went through the 20 questions one by one using the question-by-question explanations to make sure that everyone understood the obvious and implied meanings behind each question. We also studied the client information form, explaining how to complete each section, and especially how to allocate ID numbers to each respondent.

The trainees practiced on each other (3) and on other non-leprosy respondents (2) to practice the scale and filling in the questionnaire and client information form. Any difficulties or problems were discussed and solved before we used the scale on people affected by leprosy. Each trainee then practiced using the questionnaire with at least five people affected by leprosy. Each trainee had used the questionnaire at least 10 times before we started the actual study. The data collected in these pilot interviews were not included in the dataset.

#### DATA COLLECTION

A custom made client information form designed for this study was used during the first interview to collect general information about the respondent. This included a brief impairment assessment (visual acuity, muscle strength and sensation of the hands and feet and wound count) and the calculation of EHF scores.<sup>4</sup>

The SALSA questionnaire consists of 20 items each scoring from 0 to 4.<sup>2</sup>

0 = ‘I do not do this activity’

1 = ‘The activity is easy to carry out’

2 = ‘The activity is a little difficult to carry out’

3 = ‘The activity is very difficult to carry out’

4 = ‘I physically cannot do the activity’ or ‘I avoid the activity because of risk’

The SALSA questionnaire was translated from English to Hausa and translated back by a different translator for verification. Discrepancies between the original and back translated version were discussed and resolved. The Hausa translation was used by trained health staff to interview the participants. Some pilot interviews were carried out using the questionnaire and this led to some fine tuning of the translation in consultation with the interviewers.

The four interviewers – two in Kebbi/Sokoto and two in Niger State – were all native Hausa speakers. One was a nurse and three were community health extension workers. They were given 2 days of training in interview skills and how to use the SALSA questionnaire.

Eighty-five paired interviews with different interviewers took place, 10 were excluded because the interval between the two interviews was too long. The range of time between the remaining 75 paired interviews was 4–76 days (median 52).

Twenty-eight paired interviews with the same interviewer took place. All were included in the study. The range of time between interviews was 52–71 days (median 63).

The choice of who did the first interview and who was the second interviewer for each client was randomised by blindly drawing either a blue or red token from a bag.

In Niger state, the same randomisation process was used to choose which clients went into the inter-tester and the intra-tester study. The intra-tester study was only done in Niger State.

#### DATA ANALYSIS

For each item, the individual responses during the first and repeat interviews were tabulated in a  $5 \times 5$  table and, in the total group of respondents, the percentage of respondents who agreed with themselves was called the ‘Observed agreement’. An example is presented in Table 1 for item 5. Even by chance a certain percentage of respondents would have agreed with themselves and this ‘expected agreement’ was estimated from the marginal totals of the  $5 \times 5$  table. ‘Beyond-chance agreement’ was quantified using Kappa, computed as (observed agreement minus chance agreement) divided by (one minus chance agreement). In the example, only 10 respondents gave a different answer the second time and the kappa ( $k$ ) is 0.8023.

In general, with a value of Kappa less than 0.40 the agreement is considered poor to fair, 0.41–0.6 indicates moderate agreement; 0.61–0.8 good agreement and when Kappa exceeds 0.80 the agreement is very good.<sup>5</sup>

Data were recorded on forms and entered onto computer by one person using a data entry system based on EPI-INFO 6 software which included range checks and a few logical checks. Tabulations were made in EPI-INFO 2000 and these were exported to a pre-programmed Microsoft Excel worksheet for the calculation of  $k$ .

#### ETHICAL CONSIDERATIONS

The Leprosy Mission Africa Research Committee (TLMARC) and the TLM Research Ethics Committee approved the study protocol.

Verbal informed consent was obtained from all participants by the first interviewer. Written consent was not possible because most of the study population was barely literate. The participant’s name was recorded separately by the interviewer and kept only for error checking.

No respondent who had done the first interview refused the second interview.

**Table 2.** Characteristics of the study population (n = 103)

	No.	%
<i>Age (10-year intervals)</i>		
15–24	21	20.4
25–34	28	27.2
35–44	23	22.3
45–54	22	21.4
55–64	9	8.7
Mean age (years)	35.8	–
<i>Disease status</i>		
On MDT	16	15.5
RFT	87	84.5
<i>EHF score</i>		
0	32	31.1
1–3	29	18.4
4–6	26	25.2
7–9	18	17.5
10–12	8	7.8
<i>Time since diagnosis</i>		
< 1 year	7	6.8
1–5 years	40	38.8
6–10 years	24	23.3
11–20 years	17	16.5
21–30 years	12	11.7
> 30 years	3	2.9
Median time since diagnosis (yrs)	7	–
<i>Years of education</i>		
None	88	85.4
1–5	5	4.9
5–10	6	5.8
> 10	4	3.9
<i>Employment</i>		
None	88	85.4
Part-time	0	0
Full-time	15	14.6
<i>Location</i>		
Rural	87	84.5
Urban	16	15.5

## Results

### CHARACTERISTICS OF STUDY POPULATION

The 103 respondents were predominantly from a rural population, uneducated and unemployed, who had been known to be affected by leprosy for a median of 7 years (Table 2).

The mean age was 36 years. The 28 respondents who were re-interviewed by the same interviewer had lower EHF scores at baseline (median 1, range 0–8) than the 75 respondents re-interviewed by a different interviewer (median 4, range 0–12).

### INTER-TESTER RELIABILITY

Among the 75 respondents who did the first and second interview with different interviewers, the 20 items of SALSA had Kappa's ranging from 0.45–0.8; 15 items had Kappa's > 0.6; eight items had Kappa's > 0.7.

The first interviews had a mean SALSA score of 36.5 (95%CI = 34.96–38.05).

The second interview had a mean of 35.02 (95%CI = 35.01–37.99) (Table 3).

#### INTRA-TESTER RELIABILITY

Among the 28 respondents who did both interviews with the same interviewer, the 20 items of SALSA had Kappa's ranging from 0.51–1.0; 15 items had Kappa's >0.6; 12 items had Kappa's >0.7.

For item 1 (Can you see?), all respondents but one said they could see well in both interviews. Thus there was so little variation in the responses given that the observed and expected (i.e. chance) agreements were exactly the same (96%), resulting in a kappa of zero.

For item 6 (Do you wash your whole body?), there was 100% agreement between the two interviews. The expected (chance) agreement was 0.71. Thus kappa was  $(1 - 0.71)/(1 - 0.71) = 1$ .

The first interviews had a mean SALSA score of 27.36 (95%CI = 24.36–30.36) and the second interviews had a mean of 26.68 (95%CI = 23.93–29.43). (Table 4).

## Discussion

This study describes the assessment of reliability of the Hausa Translation of the Screening Activity Limitation and Safety Awareness (SALSA) scale. The SALSA scale is a new 20-item interview based instrument to measure self-perceived problems in activities of daily living (ADL).

**Table 3.** Inter-tester test-retest reliability of the SALSA: observed agreement and Kappa's with two different interviewers (n = 75)

Question	Observed agreement	Kappa	95% CI Kappa		
			Lower limit	Upper limit	
1	Can you see?	88.0%	0.4503	0.1134	0.7872
2	Sit/squat	82.7%	0.4640	0.1991	0.7289
3	Walk barefoot	77.3%	0.5509	0.3632	0.7386
4	Walk uneven ground	74.7%	0.6511	0.5155	0.7866
5	Walk longer distances	86.7%	0.8023	0.6883	0.9164
6	Wash whole body	90.7%	0.7179	0.5189	0.9169
7	Cut nails	81.3%	0.7033	0.5631	0.8435
8	Hold hot cup/basin	78.7%	0.6756	0.5346	0.8166
9	Work with tools	80.0%	0.6410	0.4786	0.8035
10	Carry heavy objects	86.7%	0.8036	0.6902	0.9169
11	Lift objects up high	85.3%	0.7393	0.5969	0.8816
12	Cook	80.0%	0.7225	0.5969	0.8481
13	Pour hot liquids	72.0%	0.6040	0.4602	0.7477
14	Open/close bottles	76.0%	0.6039	0.4443	0.7634
15	Open/close jars	81.3%	0.6842	0.5350	0.8334
16	Manipulate small objects	77.3%	0.5871	0.4145	0.7597
17	Buttons	76.0%	0.5785	0.4088	0.7483
18	Thread needles	84.0%	0.7561	0.6296	0.8826
19	Handle paper	90.7%	0.8010	0.6606	0.9414
20	Pick from floor	85.3%	0.6462	0.4531	0.8394

**Table 4.** Intra-tester test-retest reliability of the SALSA: observed agreement and Kappa's with the same interviewer (n = 28)

Question	Observed agreement	Kappa	95% CI Kappa		
			Lower limit	Upper limit	
1	Can you see?	96.4%	0.0000	- 1.0000	1.0000
2	Sit/squat	96.4%	0.6500	- 0.0236	1.0000
3	Walk barefoot	85.7%	0.7642	0.5503	0.9781
4	Walk uneven ground	78.6%	0.5088	0.1604	0.8572
5	Walk longer distances	78.6%	0.5692	0.2637	0.8748
6	Wash whole body	100%	1.0000	1.0000	1.0000
7	Cut nails	85.7%	0.7544	0.5315	0.9772
8	Hold hot cup/basin	71.4%	0.5942	0.3565	0.8319
9	Work with tools	85.7%	0.7228	0.4712	0.9743
10	Carry heavy objects	78.6%	0.6485	0.3993	0.8978
11	Lift objects up high	82.1%	0.6963	0.4551	0.9376
12	Cook	92.9%	0.8228	0.5861	1.0000
13	Pour hot liquids	67.9%	0.5855	0.3625	0.8086
14	Open/close bottles	89.3%	0.7350	0.4517	1.0000
15	Open/close jars	92.9%	0.8042	0.5427	1.0000
16	Manipulate small objects	92.9%	0.7971	0.5261	1.0000
17	Buttons	89.3%	0.7565	0.4962	1.0000
18	Thread needles	89.3%	0.8239	0.6356	1.0000
19	Handle paper	92.9%	0.8133	0.5640	1.0000
20	Pick from floor	96.4%	0.8935	0.6886	1.0000

The SALSA scale is based on the terminology and concepts of the ICF and provides a measure of the severity of activity limitation as defined in the ICF. It has been validated for people with anaesthesia as a result of leprosy and diabetes.<sup>2</sup> Respondents who report that they do not perform an activity in order to avoid damage to their hands or feet are scoring a '4' for that activity. Thus safety awareness contributes to the SALSA score as it leads to activity limitation. No attempt was made to compute a separate safety awareness score (as suggested in unpublished information about SALSA) as such a score was felt to be insufficiently validated.

The scale has first and foremost been designed to give a standardised score for activity limitation that could be compared to scores obtained from similar patient groups in other projects and programmes. It can also be used as a pre and post intervention assessment tool in the clinical situation.

The SALSA scale has been used in many different countries and situations since it was developed. It has already been used in leprosy settlements (Brazil, China, India, Nepal), in leprosy out-patients (India, Israel) and in disability surveys (Indonesia).<sup>6-10</sup> In Bangladesh, van Veen *et al.* are using the SALSA Scale along with other assessment tools to evaluate the impact of reconstructive surgery on the functioning and quality of life in persons affected by leprosy.<sup>11</sup>

Both inter and intra-tester test-retest reliability of the SALSA were good with a kappa (*k*) of >0.6 in 15 items.

The one item which scored low in both sets of interviews was Item #1 *Can you see?* Only one of the 28 respondents in the intra-tester group found seeing *a little difficult* at baseline and *easy* during the second interview. In the inter-tester group, only 13 respondents reported any

problem with seeing during either the first or the second interview. With so little variation in responses, inter- and intra-tester agreement cannot be adequately studied.

Intra-tester reliability was on the whole higher than inter-tester reliability. This is understandable as one interviewer will be more consistent in the way s/he handles specific difficulties in the responses than two interviewers acting independently.

Careful translation of the scale into the local language is important to ensure validity and reliability of the scale. Care must be taken to reach the best descriptions of each of the activities. Once the translation has been finalised, the questions need to be asked exactly as stated on the translated questionnaire. The interview needs to be carried out in a manner that makes the interviewee feel comfortable and able to answer freely without prejudice to the rehabilitation process. It is essential that the interviewer does not answer for the interviewee. For all these reasons, adequate training of the interviewers in how to use the scale is absolutely essential.

Based on our findings we conclude that the Hausa translation of SALSAs has a good reliability in Nigeria provided the interviewers are well trained.

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