SF12v2 Health Scores for African Americans using SAS in a Cluster-randomized Community Trial

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Background: Self-administered health survey short form (SF12v2) is commonly used to assess the health related quality of life (HRQOL) among populations. However, there is lack of data regarding its effectiveness among African Americans (AAs).

Design: Secondary data analysis of a prospective cohort study.

Aim: To assess the quality of life among AAs enrolled in a faith-based diabetes prevention program, Fit Body and Soul (FBAS) compared to a health education (HE) using SAS software.

Methods: Data were collected at three time points; baseline, 12 weeks, and 52 weeks. SASv9.4 was used to score the data. The SF12v2 data calculate two summary component scores, Physical Component Summary Score (PCS) and Mental Health Component Summary Score (MCS) with eight sub-domains. Scores range from 0 to 100, where a zero score indicates the lowest level of health and 100 indicates the highest level of health. Both PCS and MCS combine the 12 items in such a way that they compare to a national norm with a mean score of 50.0 and a standard deviation of 10.

Results: Total of 604 people were enrolled. FBAS included 317(mean age=46.59±10.9) and 287 (mean age=46.39±10.9) were in the HE. General health was reported good or better for 85% of the sample in both groups at baseline. Overall PCS for FBAS was 49 at baseline, 51 at week 12, and 50 at week 52 and for HE was 48 at baseline, 49 at week 12 and 49 at week 52. Overall, MCS for FBAS was 51 at baseline, 53 at week 12, and 52 at week 52 and for HE was 51 at baseline, 52 at week 12 and 51 at week 52.

Conclusion: Quality of life among participants at week 12 was improved from baseline but not maintained at week 52. SAS software was an effective program for scoring the SF12 data. The SF-12v2 appears to be a valid survey tool for the assessment of HRQOL among AAs.

Introduction

- Self-administered health survey short form (SF12v2) is commonly used to assess the health related quality of life (HRQOL) among populations.
- However, there is lack of data regarding its effectiveness among African Americans (AAs).
- The interpretation of SF-36v2™ Health Survey results has been greatly simplified with the norm-based scoring of its health domain scales and component summary measures.
- It is recommended that users base their interpretations on norm-based scores (Mean = 50, *SD* = 10) rather than 0–100 scores.
- General population norms provide a basis for meaningful comparisons across scales.
- Whenever an individual respondent's scale score is below 45, or a group mean scale score is below 47, health status is below the average range.
- Results for the PCS and MCS measures can be compared directly with results for the eight health domain scales when all are standardized on a common metric in relation to population norms.
- The PCS and MCS measures take into account the correlations among the eight health domain scales.
- Norms and scoring algorithms used results based on the SF-36v2™ Health Survey 1998 U.S. general population norms.

(Reference: *SF-36v2™ Health Survey 1998 U.S. general population norms* and to *norm-based scoring (NBS).*

Excerpts from the User's Manual for the SF-36v2 Health Survey, Second Edition, Chapter 7, pages 81-84)

Methods

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Methods: Data were collected at three time points; baseline, 12 weeks, and 52 weeks. SASv9.4 was used to score the data.

The SF12v2 data calculate two summary component scores, Physical Component Summary Score (PCS) and Mental Health Component Summary Score (MCS) with eight sub-domains.

Scores range from 0 to 100, where a zero score indicates the lowest level of health and 100 indicates the highest level of health.

Both PCS and MCS combine the 12 items in such a way that they compare to a national norm with a mean score of 50.0 and a standard deviation of 10.

SAS Code 1- Baseline

```
/*item 1 reverse coding*/
if bsf1=1 then bsf1new=5.0;
if bsf1=2 then bsf1new=4.4;
if bsf1=3 then bsf1new=3.4;
if bsf1=4 then bsf1new=2.0;
if bsf1=5 then bsf1new=1.0;

/*item5*/
if bsf5=1 then bsf5new=5;
if bsf5=2 then bsf5new=4;
if bsf5=3 then bsf5new=3;
if bsf5=4 then bsf5new=2;
if bsf5=5 then bsf5new=1;

/*item61*/
if bsf61=1 then bsf61new=5;
if bsf61=2 then bsf61new=4;
if bsf61=3 then bsf61new=3;
if bsf61=4 then bsf61new=2;
if bsf61=5 then bsf61new=1;
```

```
/*item62*/
if bsf62=1 then bsf62new=5;
if bsf62=2 then bsf62new=4;
if bsf62=3 then bsf62new=3;
if bsf62=4 then bsf62new=2;;
if bsf62=5 then bsf62new=1;

/*scale items aggregated*/
/*baseline*/
Bsfpf =bsf21+bsf22;
Bsfrp =bsf31+bsf32;
Bsfbp =bsf5new;
Bsfgh =bsf1new;
Bsfvt =bsf62new;
Bsfsf =bsf7;
Bsfre =bsf41+bsf42;
Bsfmh =bsf61new+bsf63;

/*scale transformations 0-100*/

Bsfpfts =((bsfpf-2)/4)*100;
Bsfrpts =((bsfrp-2)/8)*100;
Bsfbpts =((bsfbp-1)/4)*100;
Bsfghts =((bsfgh-1)/4)*100;
Bsfvtts =((bsfvt-1)/4)*100;
Bsfsfts =((bsfsf-1)/4)*100;
Bsfrets =((bsfre-2)/8)*100;
Bsfmhts =((bsfmh-2)/8)*100;
```

```
/*z score*/
bpfz=(bsfpfts-81.18122)/29.10558;
brpz=(bsfrpts-80.52856)/27.13526;
bbpz=(bsfbpts-81.74015)/24.53019;
bghz=(bsfghts-72.19795)/23.19041;
bvtz=(bsfvtts-55.59090)/24.84380;
bsfz=(bsfsfts-83.73973)/24.75775;
brez=(bsfrets-86.41051)/22.35543;
bmhz=(bsfmhts-70.18217)/20.50597;

/*norm based z score*/

Bpfnorm =50+(bpfz*10);
Brpnorm =50+(brpz*10);
Bbpnorm =50+(bbpz*10);
Bghnorm =50+(bghz*10);
Bvtnorm  =50+(bvtz*10);
Bsfnorm  =50+(bsfz*10);
Brenorm  =50+(brez*10);
Bmhnorm =50+(bmhz*10);
```

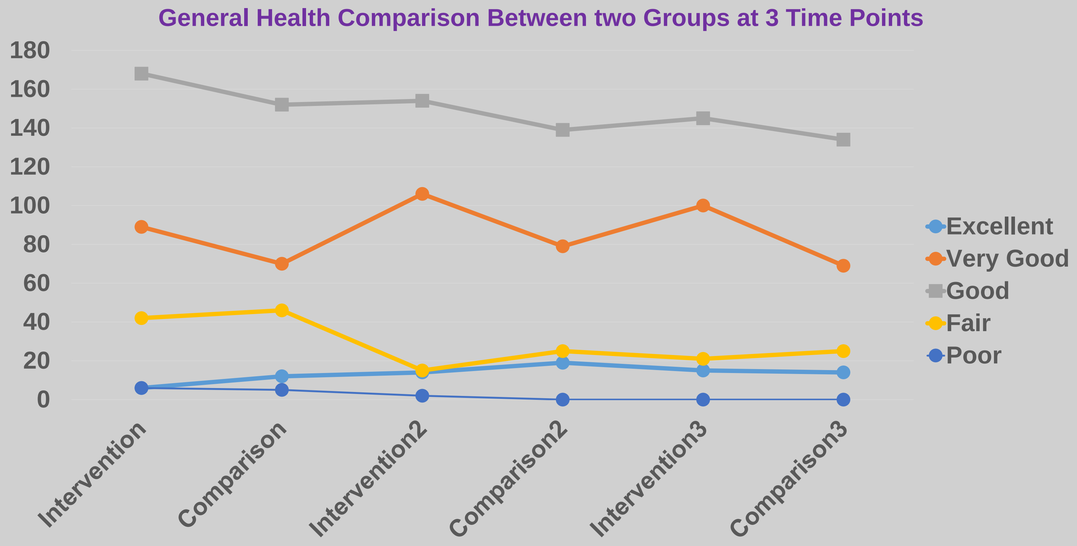
SAS Code 2- Baseline

```
/*aggregate  scale score PCS and MCS*/

bpcs=( bpfz *.42402)+ (brpz*.35119)+(bbpz*.31754)+( bghz*.24954)+( bvtz*.02877)+ (bsfz*-.00753)+ (brez*-.19206)+( bmhz*-.22069);

bmcs= ( bpfz *-.22999)+ (brpz*-.12329)+(bbpz*-.09731)+( bghz*-.01571)+( bvtz*.23534)+ (bsfz*.26876)+ (brez*.43407)+( bmhz*.48581);


/*Transformed PCS and MCS*/

bpcsts=50+(bpcs*10);
bmcsts=50+(bmcs*10);
```

Results 1

Table 1: General Health of the FBAS participants at baseline, week 12, and week 52- intervention and comparison arms using SF 12v2. Frequencies and percentages from 20 churches (n=604; 0-100 score range)

Characteristics	Baseline				Week 12				Week 52			
	Intervention		Comparison		Intervention		Comparison		Intervention		Comparison	
	N	%	N	%	N	%	N	%	N	%	N	%
Participants	317	52.48	287	47.52	291	52.62	262	47.38	283	53.90	242	46.10
General Health												
Excellent	6	1.89	12	4.18	14	4.81	19	7.25	15	5.30	14	5.79
Very Good	89	28.08	70	24.39	106	36.43	79	30.15	100	35.34	69	28.51
Good	168	53	152	52.96	154	52.92	139	53.05	145	51.24	134	55.37
Fair	42	13.25	46	16.03	15	5.15	25	9.54	21	7.42	25	10.33
Poor	6	1.89	5	1.74	2	0.69	0		2	0.71	0	



Results 3

Table 3: Characteristics of the FBAS participants for intervention (n=317) and comparison (n=287) using SF 12v2 Norm based scoring. Comparison of baseline, week 12, and week 52 mean values

SF-12v2 Scale	Baseline			Week 12			Week 52		
Intervention (n= 317)	N	Mean±SD	95% CI	N	Mean±SD	95% CI	N	Mean±SD	95% CI
Physical Functioning (PF)	309	50.77±9.30	49.73-51.81	291	51.77±8.23	50.82-52.72	283	51.73±8.86	50.69-52.77
Role Physical (RP)	309	50.90±8.58	49.94-51.86	290	51.81±8.09	50.87-52.74	281	50.90±9.19	49.82-51.98
Bodily Pain (BP)	311	49.81±10.39	48.65-50.97	291	50.33±9.68	49.22-51.45	283	50.10±10.06	48.92-51.27
General Health (GH)	311	45.62±9.06	44.61-46.63	291	48.54±7.66	47.66-49.43	283	48.16±8.19	47.20-49.12
Vitality (VT)	311	51.37±9.14	50.35-52.39	290	53.75±8.28	52.80-54.71	283	52.30±9.44	51.20-53.41
Social Functioning (SF)	311	51.73±7.94	50.84-52.62	290	53.02±7.42	52.16-53.87	283	51.57±8.69	50.56-52.59
Role Emotional (RE)	310	50.99±8.14	50.08-51.90	291	51.24±9.03	50.20-52.28	282	50.55±9.59	49.42-51.67
Mental Health (MH)	311	52.82±8.37	51.89-53.75	290	53.95±8.16	53.00-54.89	282	53.80±8.06	52.85-54.74
Physical Component Summary (PCS)	308	48.75±8.92	47.75-49.75	289	50.09±7.78	49.19-50.99	279	49.74±8.49	48.74-50.74
Mental Component Summary (MCS)	308	52.43±8.38	51.49-53.37	289	53.49±8.19	52.54-54.44	279	52.67±8.30	51.69-53.64
Comparison (n= 287)	N	Mean±SD	95% CI	N	Mean±SD	95% CI	N	Mean±SD	95% CI
Physical Functioning (PF)	285	50.98±8.34	50.01-51.95	261	50.90±8.42	49.88-51.93	243	50.77±9.44	49.58-51.97
Role Physical (RP)	285	50.37±8.72	49.35-51.39	261	51.17±8.91	50.09-52.26	242	51.01±8.71	49.90-52.11
Bodily Pain (BP)	286	50.50±9.24	4942-51.57	262	50.91±9.78	49.72-52.10	243	49.89±10.72	48.55-51.24
General Health (GH)	285	45.22±9.47	44.12-46.33	262	47.80±8.32	46.79-48.81	242	47.25±8.24	46.21-48.30
Vitality (VT)	286	51.30±9.37	50.21-52.39	262	53.28±8.24	52.28-54.28	243	51.93±8.51	50.86-53.01
Social Functioning (SF)	286	52.01±8.18	51.06-52.96	262	52.91±7.87	51.95-53.86	243	51.12±8.86	50.00-52.24
Role Emotional (RE)	285	49.86±9.83	48.71-51.01	261	50.55±9.31	49.52-51.69	241	50.16±9.57	48.95-51.38
Mental Health (MH)	286	52.61±8.90	51.57-53.64	262	53.44±8.53	52.41-54.48	243	53.10±8.05	52.08-54.12
Physical Component Summary (PCS)	282	49.14±7.73	48.23-50.04	260	49.75±8.08	48.76-50.74	239	49.23±9.34	48.04-50.42
Mental Component Summary (MCS)	282	51.80±9.18	50.72-52.87	260	53.02±8.20	52.02-54.02	239	52.12±9.26	50.94-53.30

Results 4

Table 4: SF 12v2 Physical Component score (PCS) comparison for age group above 45

Age	PCS						
	National	FBAS					
	General US population	Baseline		Week 12		Week 52	
		Intervention	Comparison	Intervention	Comparison	Intervention	Comparison
45 – 54/108	50	49	52	51	53	50	53
55 – 64/87	47	47	48	48	49	48	48

Table 5: SF 12v2 Mental Component score (MCS) comparison for age group above 45

Age	MCS						
	National	FBAS					
	General US population	Baseline		Week 12		Week 52	
		Intervention	Comparison	Intervention	Comparison	Intervention	Comparison
45 – 54/115	50	53	52	55	53	54	53
55 – 64/66	47	54	55	54	55	53	54

Results 5

- **Total of 604 people were enrolled. FBAS included 317(mean age=46.59±10.9) and 287 (mean age=46.39±10.9) were in the HE.**
- **General health was reported good or better for 85% of the sample in both groups at baseline.**
- **Overall PCS for FBAS was 49 at baseline, 51 at week 12, and 50 at week 52 and for HE was 48 at baseline, 49 at week 12 and 49 at week 52.**
- **Overall, MCS for FBAS was 51 at baseline, 53 at week 12, and 52 at week 52 and for HE was 51 at baseline, 52 at week 12 and 51 at week 52.**

Conclusion

- **Quality of life among participants at week 12 was improved from baseline, but not maintained at week 52.**
- **SAS software was an effective program for scoring the SF12 data.**
- **The SF-12v2 appears to be a valid survey tool for the assessment of HRQOL among African Americans.**

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