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The LifeWindows Information-- Motivation -- Behavioral Skills ART Adherence Questionnaire (LW-IMB-AAQ)

The LW-IMB-AAQ was developed as a measure of barriers to antiretroviral therapy (ART) adherence among HIV+ patients in clinical care, following the constructs identified in the Information--Motivation--Behavioral Skills (IMB) model of adherence (Fisher, Fisher, Amico, & Harman, 2006). The LW-IMB-AAQ was created for use within the LifeWindows adherence intervention software program, a computer-delivered ART adherence intervention that is currently being evaluated in a multi-site randomized clinical trial¹. As such, it is important to note that the LW-IMB-AAQ will undergo continued evaluation and revision over the course of the LifeWindows project.

The LW-IMB-AAQ provides the LifeWindows intervention program with critical information about users' ART adherence-related strengths and weaknesses. The software program then uses that information to determine which specific intervention activities would be most relevant to a user given his or her specific constellation of adherence-related barriers. The user is then offered this targeted set of intervention activities and asked to select an activity that would be most helpful in improving or maintaining his or her ART adherence. Thus, each LW-IMB-AAQ item serves a dual purpose: quantifying information, motivation, and/or behavioral skills strengths and weaknesses, and signaling which specific IMB adherence-related deficits should be addressed in order for adherence to improve or most effectively be maintained.

In developing the LW-IMB-AAQ items, item content was targeted specifically to reflect barriers within the information, motivation, and behavioral skills constructs pertinent to the population involved in the LifeWindows project. It is likely, however, that the barriers reflected in the LW-IMB-AAQ will generalize across many HIV+ populations. Nonetheless, any applications of this measure outside of the LifeWindows project should take into consideration (a) the purpose for which the measure was developed— quantification of IMB based adherence-related deficits so as to direct participants to available intervention activities and (b) the target population for whom it was developed—HIV+ men and women in clinical care. It is also important to note that the measure is not intended for use as a comprehensive or generic measure of the IMB model of adherence constructs. Our preliminary analyses suggest that the LW-IMB-AAQ does provide an overview of adherence related barriers that generally fall within information, motivation, and behavioral skills areas, and can be used as a tool to quickly identify potential adherence related deficits in practical or real-world settings. The measure and its psychometric properties will be evaluated over the course of the LifeWindows project.

The LifeWindows Information-- Motivation -- Behavioral Skills ART Adherence Questionnaire (LW-IMB-AAQ) ITEMS

Note: Each LW-IMB-AAQ item represents a barrier primarily falling within the I (Information), M (Motivation), or B (Behavioral Skills) constructs. When used with the LifeWindows ART adherence intervention software program, a 'critical zone' is superimposed for a range of response options for each item (reflected here as shaded and in red text). Responses within the critical zone are interpreted as signaling the presence of a deficit or potential deficit that then triggers the offering of intervention activities specifically developed to address the barrier reflected in the content of the item.

- I1** I know how each of my current HIV medications is supposed to be taken (for example whether or not my current medications can be taken with food, herbal supplements, or other prescription medications).

I strongly disagree

I somewhat disagree

I neither agree nor disagree

I somewhat agree

I strongly agree

- I2** I know what to do if I miss a dose of any of my HIV medications (for example, whether or not to take the pill(s) later).

I strongly disagree

I somewhat disagree

I neither agree nor disagree

I somewhat agree

I strongly agree

- I3** Skipping a few of my HIV medications from time to time would not really hurt my health.

I strongly disagree

I somewhat disagree

I neither agree nor disagree

I somewhat agree

I strongly agree

- I4** I know what the possible side effects of each of my HIV medications are.

I strongly disagree

I somewhat disagree

I neither agree nor disagree

I somewhat agree

I strongly agree

- I5** As long as I am feeling healthy, missing my HIV medications from time to time is OK.

I strongly disagree

I somewhat disagree

I neither agree nor disagree

I somewhat agree

I strongly agree

- I6** I understand how each of my HIV medications works in my body to fight HIV.

I strongly disagree

I somewhat disagree

I neither agree nor disagree

I somewhat agree

I strongly agree

I7 If I don't take my HIV medications as prescribed, these kinds of medications may not work for me in the future.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I strongly disagree	I somewhat disagree	I neither agree nor disagree	I somewhat agree	I strongly agree

I8 I believe that if I take my HIV medications as prescribed, I will live longer.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I strongly disagree	I somewhat disagree	I neither agree nor disagree	I somewhat agree	I strongly agree

I9 I know how my HIV medications interact with alcohol and street drugs.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I strongly disagree	I somewhat disagree	I neither agree nor disagree	I somewhat agree	I strongly agree

M1 I am worried that other people might realize that I am HIV+ if they see me taking my HIV medications.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I strongly disagree	I somewhat disagree	I neither agree nor disagree	I somewhat agree	I strongly agree

M2 I get frustrated taking my HIV medications because I have to plan my life around them.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I strongly disagree	I somewhat disagree	I neither agree nor disagree	I somewhat agree	I strongly agree

M3 I don't like taking my HIV medications because they remind me that I am HIV+.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I strongly disagree	I somewhat disagree	I neither agree nor disagree	I somewhat agree	I strongly agree

M4 I feel that my healthcare provider takes my needs into account when making recommendations about which HIV medications to take.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I strongly disagree	I somewhat disagree	I neither agree nor disagree	I somewhat agree	I strongly agree

M5 Most people who are important to me who know I'm HIV positive support me in taking my HIV medications.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I strongly disagree	I somewhat disagree	I neither agree nor disagree	I somewhat agree	I strongly Agree	No one that I care about knows I am positive

M6 My healthcare provider doesn't give me enough support when it comes to taking my

medications as prescribed.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I strongly disagree	I somewhat disagree	I neither agree nor disagree	I somewhat agree	I strongly agree

M7 It frustrates me to think that I will have to take these HIV medications every day for the rest of my life.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I strongly disagree	I somewhat disagree	I neither agree nor disagree	I somewhat agree	I strongly agree

M8 I am worried that the HIV medications I have been prescribed will hurt my health.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I strongly disagree	I somewhat disagree	I neither agree nor disagree	I somewhat agree	I strongly agree

M9 It upsets me that the HIV medications I have been prescribed can affect the way I look.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I strongly disagree	I somewhat disagree	I neither agree nor disagree	I somewhat agree	I strongly agree

M10 It upsets me that the HIV medications I have been prescribed can cause side effects.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I strongly disagree	I somewhat disagree	I neither agree nor disagree	I somewhat agree	I strongly agree

B1 There are times when it is hard for me to take my HIV medications when I drink alcohol or use street drugs.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I strongly disagree	I somewhat disagree	I neither agree nor disagree	I somewhat agree	I strongly agree	I don't drink alcohol or use street drugs

B2 How hard or easy is it for you to stay informed about HIV treatment?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Very hard	Hard	Sometimes hard, sometimes easy	Easy	Very easy

B3 How hard or easy is it for you to get the support you need from others for taking your HIV medications (for example, from friends, family, doctor, or pharmacist)?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Very hard	Hard	Sometimes hard, sometimes easy	Easy	Very easy

B4 How hard or easy is it for you to get your HIV medication refills on time?

Very hard

Hard

Sometimes hard,
sometimes easy

Easy

Very easy

B5 How hard or easy is it for you to take your HIV medications when you are wrapped up in what you are doing?

Very hard

Hard

Sometimes hard,
sometimes easy

Easy

Very easy

B6 How hard or easy is it for you to manage the side effects of your HIV medications?

Very hard

Hard

Sometimes hard,
sometimes easy

Easy

Very easy

B7 How hard or easy is it for you to remember to take your HIV medications?

Very hard

Hard

Sometimes hard,
sometimes easy

Easy

Very easy

B8 How hard or easy is it for you to take your HIV medications because the pills are hard to swallow, taste bad, or make you sick to your stomach?

Very hard

Hard

Sometimes hard,
sometimes easy

Easy

Very easy

B9 How hard or easy is it for you to make your HIV medications part of your daily life?

Very hard

Hard

Sometimes hard,
sometimes easy

Easy

Very easy

B10 How hard or easy is it for you to take your HIV medications when your usual routine changes (for example, when you travel or when you go out with your friends)?

Very hard

Hard

Sometimes hard,
sometimes easy

Easy

Very easy

B11 How hard or easy is it for you to take your HIV medications when you do not feel good emotionally (for example, when you are depressed, sad, angry, or stressed out)?

Very hard

Hard

Sometimes hard,
sometimes easy

Easy

Very easy

B12 How hard or easy is it for you to take your HIV medications when you feel good physically and don't have any symptoms of your HIV disease?

Very hard

Hard

Sometimes hard,
sometimes easy

Easy

Very easy

B13 How hard or easy is it for you to take your HIV medications when you do NOT feel good physically?

Very hard

Hard

Sometimes hard,
sometimes easy

Easy

Very easy

B14 How hard or easy is it for you to talk to your health care provider about your HIV medications?

Very hard

Hard

Sometimes hard,
sometimes easy

Easy

Very easy

SCORING LW-IMB-AAQ

IMPORTANT NOTE

The scoring suggestions provided here are based on our preliminary work with the LW-IMB-AAQ. It must be emphasized that the measure is under continued evaluation in the LifeWindows project¹ and may be revised during the course of this multi-site randomized clinical trial. We provide suggestions for scale and sub-scale scoring, but strongly encourage all research utilizing this measure to carefully explore item covariances, scale structure, reliability, and validity when computing scale or sub-scale scores for their specific study populations.

NOT APPLICABLE RESPONSE OPTIONS

Prior to scoring the LW-IMB-AAQ, M5 and B1's "not applicable" options must be reviewed. Depending on your sample, an M5 response of "No one that I care about knows I am positive" may represent a potential barrier (e.g., within the target population HIV disclosure to friends/family is common and nondisclosure could impede medication adherence) or may not indicate a potential problem (e.g., in the target population disclosure is uncommon and privacy regarding HIV status is the 'cultural norm'). Thus, based on the specific sample targeted, M5's n/a response might be appropriated rescored as 'strongly disagree' or 'strongly agree'. When such determinations are not possible, an alternative strategy is to use average scores for motivation and allow this item to be missing for those who responded n/a. For B1, participants may indicate n/a because they do not use drugs or alcohol. In practice, not applicable responses for B1 may represent the absence of a barrier and may be reset to the "strongly disagree" category without consequence.

USE OF EACH INDIVIDUAL ITEM'S CRITICAL ZONES

Responses within the critical region indicate information, motivation, and/or behavioral skills deficits in the content captured by the individual item. Each item can be used individually as an indicator for the need for remediation of the deficit specified by the item. This strategy can have clinical utility, but it should be noted that because of high inter-item consistency in some of the subscales, multicollinearity will pose problems in statistical models that attempt to include certain sets of items as independent variables. Researchers should carefully evaluate that potential when assessing models that use individual LW-IMB-AAQ items. Additionally, while the adherence-related deficits represented in the LW-IMB-AAQ are likely to be applicable across diverse populations, the critical zones developed for the current measure was based on targeted elicitation work with the population involved in the LifeWindows project. Thus, it would be prudent for researchers to closely evaluate the extent to which the current measure's critical zones are appropriate for other specific study populations.

CREATING SUBSCALES

Item sets can be used to quantify information, motivation, and behavioral skills strengths, or alternatively, weaknesses in regard the ART adherence. It is important to note that the resulting subscales are not intended to provide full representation of the IMB model of adherence, but do provide a brief measure of the level of informational, motivational, and behavioral skills deficits in the targeted population. The scoring strategies presented are based on our preliminary review of the LW-IMB-AAQ and primarily utilize a total score strategy (add responses across all items in subscale), although, as previously mentioned, an average score strategy could be instead (divide the summed responses by the number of valid items for each participant). Because the measure is under continued evaluation in the LifeWindows project, the measure and scoring suggestions and strategies may change over the course of the multi-site randomized clinical trial.

INFORMATION

Scoring strategies suggested here create a scale that reflects strengths in ART adherence Information.

TOTAL SCORE:

After reverse scoring I3 and I5, sum across all items to create a total score.

ACCURACY SCORE:

Score only “Strongly Agree” to a value of 1 for all I items except I3 and I5. Set other for response values for those items to 0.

Score only “Strongly Disagree” to a value of 1 for items I3 and I5. Set other response values for those items are scored 0.

Sum across all items for a ‘total correct’ score. Our current research demonstrates an internal consistency for this scale that is expectedly low (.59), as information about diverse aspects of one’s ART regimen is not anticipated to be inter-related. According to our preliminary analyses, this accuracy score is best represented as a summed total score. Alternative strategies may include expanding the range of response options that would reflect a “correct” response (e.g., expand from Strongly Agree only to include both Agree and Strongly Agree). These alternative strategies are also under evaluation in our on-going LifeWindows project.

MOTIVATION

SCORING SUBSCALES:

Items designated with an M are used to quantify the motivation construct and to activate a potential motivationally based intervention in the LifeWindows program. Following the IMB Model of Adherence (Fisher et al., 2006), adherence-related motivation is comprised of personal and social motivation to adhere to one’s regimen. **Personal motivation** is represented as attitudes and beliefs about ART medications and one’s adherence to their specific ART regimen across situations and over time. Attitudes/beliefs about ART medications themselves are represented by items M9, M10, and M8, which represent the perceived consequences of these medications. Attitudes/beliefs about adherence are represented by items M1, M2, M3, and M7, each of which speak to the burden of adherence and its impact on daily life. **Social Motivation** is represented primarily by item M5. Additionally, items reflecting patient-provider relationship and collaboration (e.g., M4 and reverse score of M6) may represent another component of social motivation.

Preliminary data gathered from the LifeWindows project demonstrated an internal item-consistency of .70 for attitudes/beliefs regarding the burden of adherence (M9, M10, and M8) and .75 for attitudes/beliefs about the negative effects of ART medications (M1, M2, M3, and M7).

We are currently reviewing the most appropriate combination of the social motivation items. Preliminary results suggest a viable combination is summing M4 and M5 and representing social motivation as a single indicator item (sum of M4 and M5) or, alternatively, a strategy using M5 only as an indicator of social motivation has produced promising results.

Other M labeled items may be appropriately considered and combined depending on the target sample. Given the dual purpose of each M item (measuring constructs and flagging a need for intervention), it is likely that some items will perform better in one versus the other function and thus final analyses of the scale may not include all of the M items presented in the LW-IMB-AAQ.

TOTAL MOTIVATION SCORE:

If collapsing across all subscales and creating a total motivation score, where larger values reflect larger amounts of motivation towards adherence, items reflecting deficiencies (M1, M2, M3, M6, M7, M8, M9, M10) should be reverse scored prior to summing.

BEHAVIORAL SKILLS

TOTAL SCORE:

All B labeled items except B1 can be summed to represent a total behavioral skills score. Our preliminary work with LifeWindows project data suggests an internal consistency of .90 between these items. B1 appears to behave differently and does not share significant variability with the other behavioral skills items. B1 may be more valuable as an indicator of a barrier and need for intervention, but may also prove to be useful in explaining adherence for individuals who specifically use alcohol or drugs.

REFERENCES

Fisher, J.D., Fisher, W.A., Amico, K.R., & Harman, J.J. (2006). An information-motivation-behavioral skills model of adherence to antiretroviral therapy. *Health Psychology, 25*, 462-473.

¹ **THE LIFEWINDOWS PROJECT: Changing ART Adherence Behavior**

PI: JD. Fisher

CO-PIs: KR. Amico, DH. Cornman, WA. Fisher

Intervention and Measures Development Team Members: KR. Amico, W. Barta, DH.

Cornman, R. Ferrer, JD. Fisher, WA. Fisher, A. LeMieux, D. Portnoy, W. Norton, C. Redding, P.

Shuper, Z. Strickler, C. Trayling

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