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Development of Measures of Organizational Leadership for Health Promotion

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This study describes the development and psychometric evaluation of four scales measuring leadership for health promotion at an organizational level in the baseline survey ($n = 144$) of the Alberta Heart Health Project. Content validity was established through a series of focus groups and expert opinion appraisals, pilot testing of a draft based on capacity assessment instruments developed by other provinces involved in the Canadian Heart Health Initiative, and the literature. Psychometric analyses provided empirical evidence of the construct validity and reliability of the organizational leadership scales. Principal component analysis verified the unidimensionality of the leadership scales of (a) Practices for Organizational Learning, (b) Wellness Planning, (c) Workplace Climate, and (d) Organization Member Development. Scale alpha coefficients ranged between .79 and .91 thus establishing good to high scale internal consistencies. These measures can be used by both researchers and practitioners for the assessment of organizational leadership for health promotion and heart health promotion.

Keywords: *leadership; scale development; heart health; health organizations; capacity assessment*

Cardiovascular disease (CVD) is recognized as a leading cause of morbidity and mortality in the developed world (World Health Organization, 2002). For example, within the province of Alberta, Canada, CVD is the most frequent cause of mortality with more than 50% of the population shown to be at elevated risk due to the presence of one or more major risk factors (Alberta Health, 1997). To address this extensive health issue, international and national experts have advocated that health-promoting changes at the socio-environmental level of society (i.e., beyond individual lifestyle) are key to sustainable actions that effectively reduce CVD morbidity and mortality (Pearson et al., 1998; Pipe, 1995). Moreover, action at the local level is viewed as paramount to develop and sustain community norms that support healthy behaviors and discourage unhealthy ones over the lifespan (Hancock, 1993; Minkler, 1998). As a key feature of the restructured Canadian health system since the mid-1990s, local regional health authorities (RHAs) in Alberta

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Readers may contact the corresponding author for a copy of the Leadership Scales.

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have been vested with accountability for population health promotion (HP). Capacity is required to promote and support complex HP actions that reduce and prevent the current burden of CVD-related health issues.

Capacity for (Heart) HP

Hawe, Noort, King, and Jordens (1997) have described capacity for HP as:

the *value added* to a system so that it can sustain any particular health promotion and disease prevention program, and so it has developed a set of critical skills and is willing to initiate additional health promotion and disease prevention programs. (p. 32)

Hawe and colleagues' value-added notion can thus be specified as the creation/strengthening of the dimensions of infrastructure and the will to act on heart health promotion (HHP) thereby "creating generic capacity to tackle health issues" (1997, p. 33).

Over the course of 5 years and in the context of health settings as learning organizations, the Alberta Heart Health Project: Dissemination Phase (AHHP) is exploring the process of building capacity for HP within the 17 regional health authorities of Alberta (Smith et al., 2001). The current study develops measures of leadership for HP at the organizational level of analysis within the baseline capacity assessment of RHAs.

The project incorporates conceptualizations, articulated by the international heart health movement through the 1998 Singapore Declaration,* about strategies and opportunities for creation of capacity for HP action in relation to heart health and other public health issues (Pearson et al., 1998). A key overarching theme in the declaration is the delineation of infrastructure and the will to act as the two pivotal components of capacity. Moreover, the AHHP has reconceptualized the work of the declaration to include leadership as a key catalyzing force of capacity building for HP within the learning organization approach (Argyris & Schon, 1978; Senge, 1990; Simon, 1969; see Figure 1). Thus, the Alberta Model depicts leadership as the basis upon which the development of capacity rests. Consistent with the Singapore Declaration, will and infrastructure are the pillars of capacity. The spiral in the model depicts Rogers's (1995) stages of diffusion of innovations within organizations, shown as a nonlinear progression of learning for organizational change. The ultimate outcome of capacity building is increased HP actions. Leadership is therefore conceptualized as a foundational dimension to drive organizational learning and change for development of its will to act and creation of an infrastructure for HP action.

Defining Organizational Leadership for HP

There are recommendations to expand the conceptualization of leadership beyond the individual leader-follower relationship and small group levels of analyses (Gronn, 1999; Villa, Howell, Dorfman, & Daniel, 2003; Walman & Yammarino, 1999; Yukl, 1999; Zaccaro & Horn, 2003). In one rare study on leadership and HP in organizations as a whole, Witte (1993) found that management style (i.e., democratic vs. authoritarian) in

*Issued on the occasion of the Third International Conference on Heart Health held in Singapore, this declaration has had a clear influence on the conceptualization and operationalization of capacity for health promotion in most Canadian heart health projects (O'Loughlin et al., 2001).

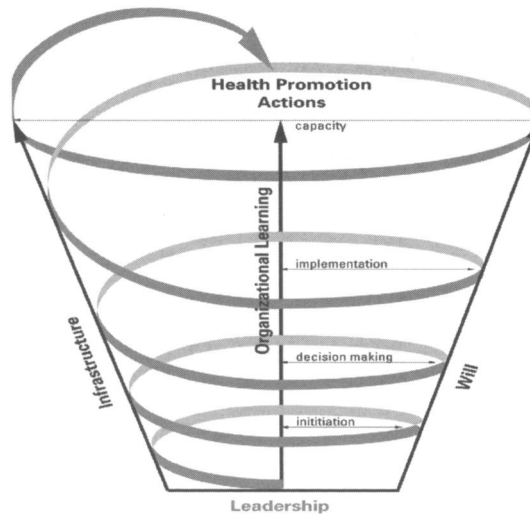


Figure 1. Model of capacity building for health promotion within the context of a learning organization.

SOURCE: Smith et al. (2001). Reprinted with permission from the International Union for Health Promotion and Education.

these private sector settings ($n = 48$) was related to the prevalence of HP programs and future plans for HP. That is, those that were assessed to have overall democratic management styles tended to plan and implement more worksite HP programs than those organizations assessed as a whole to be more authoritarian.

These recent conceptualizations thus shift the focus on investigating leadership from a preoccupation with the meso/micro level of the leader-follower interface to a broader macro focus on the organization as a whole and its interpersonal processes that influence actions for organizational goal achievement (Day, 2001; Nirenberg, 2001; Osborn, Hunt, & Jauch, 2002; Yukl, 1998; Yukl & Van Fleet, 1992). Such leadership processes therefore enable, catalyze, or facilitate organizational actions rather than command them given the complexity of modern organizations and the impracticality of the controlling approach in such contexts (Marion & Uhl-Bien, 2001).

In this study, the emphasis is on leadership as multiple processes that influence and shape organizational actions for HP/HHP. Rather than innate traits of an individual or merely a position in the organizational hierarchy, leadership is conceived as a pervasive function enacted by many members across the organization. Specifically, building on the work of Hawe et al. (1997), Nirenberg (2001), and Yukl and Van Fleet (1992), organizational leadership for HP/HHP is defined as a multidimensional process in which members, across multiple levels, exert influence on:

1. the development of HHP objectives and action strategies for the improvement of community health,

2. the implementation of action strategies to achieve community heart health objectives,
3. organizational practices that strengthen group involvement and commitment to ongoing HP efforts, and
4. the development of a learning culture that sustains up-to-date HP actions and effective community interaction by the organization.

In the above definition of leadership, statements 1 and 2 reflect processes to enhance involvement on the specific issue of heart health. Building on Hawe and colleagues' work (1997; Hawe, King, Noort, Jordens, & Lloyd, 2000), statements 3 and 4 reflect an organization's opportunities to enhance its ongoing capacity to tackle other HP issues via the learning experienced in addressing a specific issue (i.e., HHP).

In summary, the dynamic and complex literature on leadership underscores its importance to organizational life. Leadership for HP and its relationship to RHA action on heart health issues are areas where advancement of knowledge could make valuable contributions to improving the health of the population. However, limited research exists with respect to its study at the organization-wide level, and the examination of leadership is even more limited with respect to HP in health care contexts. The purpose of the current study, therefore, is to develop psychometrically robust measures of leadership for HP at the organizational level for use in the examination of the Alberta regional health authority capacity for HP/HHP actions.

METHOD

Instrument

In addition to the above definition of leadership (see *Defining Organizational Leadership for HP*) as multidimensional processes linking members across different levels in the influence of HP/HHP goals, objectives, and their attainment, two leadership scales were developed. These scales measured (a) practices that strengthen organizational involvement in the development and implementation of HP objectives and strategies and (b) practices that develop an organizational learning culture to sustain such involvement in HP. The variables selected for inclusion in these leadership scales were based on those used in other provincial heart health research efforts (i.e., Nova Scotia, Ontario, Saskatchewan, and British Columbia) and the literature (Hawe et al., 2000) thereby supporting an association between leadership and organizational capacity for HP.

Instrument Development

A 2-day think tank was held with Canadian Heart Health Initiative (CHHI) researchers from the provinces of Saskatchewan, British Columbia, Ontario, and Nova Scotia with the purpose of discussing experiences with the shared assessment tools from each provincial project. From this, a table was constructed listing the different components of leadership and the specific items found within each component. This assisted the identification of constructs to be measured along with establishing content validity. Some items and response choices were modified to meet AHHP research needs. All leadership items were compiled into a questionnaire addressing organizational capacity. The capacity survey

required the individual respondents to reflect on the organization as a whole and its capacity to do HHP.

The instrument was then subjected to a focus test with HP professionals ($n = 5$; including faculty and staff from national and provincial health agencies) to further establish and verify content validity of the measures. Focus group participants initially completed the questionnaire and were asked to identify any expressions or items that appeared unclear. Subsequent modifications were made to the instruments.

A pilot version of the questionnaire was then drafted and tested with three HP-based organizations from Alberta ($n = 16$). The organizations represented local-, provincial-, and national-level organizations but did not include the target group of the study proper. The pilot test aimed at identifying any questionnaire item ambiguities and verifying the clarity of the questions. The instrument was also reviewed by 37 key individuals from the CHHI to verify the content validity of the leadership for HP dimensions.

Instrument for the Study Proper

Based on the above face and content validity testing, the final questionnaire was designed to elicit the perceived magnitude of organizational leadership for HP in RHAs. It contained 33 items designed to measure the current level of organization-wide practices: to strengthen organizational involvement in HP (one scale, 27 items) and for organizational learning (one scale, 6 items). This second scale is based on Hawe and colleagues' (2000) 11-item Capacity for Organizational Learning Checklist,* modified for AHHP research purposes. Five-point Likert-type scales were used to operationalize all items.

Participants

In collaboration with the site AHHP coordinator in each RHA, a convenience sample of 158 representatives from three organizational levels across all 17 RHAs in the province of Alberta was identified to complete the final instrument. With a response rate of 91% ($n = 144$), they included board members ($n = 30$), senior/middle management ($n = 58$), and service providers ($n = 56$). Each respondent completed an individual assessment of perceived organizational leadership for HP/HHP. The respondents, in the majority, were females (85%) ranging in age from 40 to 49 years ($M = 3.2$, $SD = 0.88$) and had worked an average of 4.5 years ($SD = 4.4$) in their current position.

Analysis: Assessment of Construct Validity

Scales were developed using the following procedures. Global scales were established a priori based on the literature and those previously field tested in other provincial research efforts of the CHHI. Scale structures were then tested using factorial analytical techniques (Tabachnick & Fidell, 1996). Principal component analysis (PCA) was used to confirm the unidimensionality of theoretically predetermined scales and/or to reduce the large number of variables into more parsimonious and manageable components. Of the two original scales, one was confirmed and one was reduced to three subscales

*The Capacity for Organizational Learning Checklist was developed as an indicator of health promotion capability in organizations. It was tested for face validity, interrater reliability, and internal consistency with a sample of health promotion practitioners in 130 health promotion projects across New South Wales, Australia (Hawe, King, Noort, Jordens, & Lloyd, 2000).

based on a combined analysis of all 33 items. The Statistical Package for Social Science version 10.0 (SPSS) was used for all calculations.

Each respondent was required to have answered at least two thirds of the items pertaining to a particular scale to be included in the PCA (Plotnikoff, 1994). Ten cases were identified as borderline or not meeting this standard; however, on further PCA analysis, the difference between inclusion and removal of these cases was negligible. Because of the small sample size, these cases were retained, and any missing data were replaced with the individual variable mean (Tabachnick & Fidell, 1996).

Next, Bartlett's test of sphericity and the Kaiser-Meyer Olkin (KMO) test of sampling adequacy were performed and confirmed the appropriateness of conducting PCA with this sample (Norusis, 1993; Tabachnick & Fidell, 1996). As a general rule, factor analytic techniques require a minimum of 5 to 10 cases for every variable tested. However, Bartlett's test of sphericity is considered strongly predictive of sampling adequacy when the number of variables per case is four or five, as was the situation in this sample (Tabachnick & Fidell, 1996). With all scales attaining a significance level of $p < .001$, this test rejected the hypothesis that the correlation matrix is an identity, and thus, the sample is at an adequate level to perform PCA. Finally, the KMO test revealed a value of .92 for the set of variables—well above the .50 considered satisfactory to explain the correlations between variables (Norusis, 1993). Therefore, the KMO test of sampling adequacy provided additional evidence for the appropriateness of conducting PCA with this sample (Tabachnick & Fidell, 1996).

PCA with Kaiser normalization employing both orthogonal and oblique rotations were then performed on the extracted components (Tabachnick & Fidell, 1996). Based on a combined analysis of all items from both original leadership scales, the interitem correlation matrix provided evidence of numerous correlations higher than the .30 item suppression level. An item was considered to belong to a given component if its correlation was .40 or higher and differences in cross-loadings on opposing factors were .20 or greater (Plotnikoff, 1994). In some instances, cross-loading differences less than .20 were accepted if the item contributed important content validity to the subscale (Plotnikoff, 1994). Two iterations of PCAs were conducted to trim items using the above parameters. Eigenvalues (> 1.0) and scree test results (where eigenvalues begin to level off) were also examined to establish the number of constructs. Based on analysis of the final solution, the appropriate number of components were conserved and interpreted.

Cronbach's alpha testing was used to estimate the internal consistency of each of the leadership scales. After PCA and reliability analyses, scales were created and named. This final solution was determined by examination of item content congruency as well as PCA and reliability test results (Tabachnick & Fidell, 1996). Last, bivariate correlation testing of the new scales using Pearson's correlation coefficient was performed to further establish the unidimensionality of each scale.

RESULTS

The final solution yielded four scales with a total of 18 items to measure organizational leadership for HP. The results are displayed in Table 1, which lists the respective items for each scale with its percentage variance and eigenvalue as well as the cross-loadings and alpha if an item deleted for all 18 items. Two items with less than a .20 loading difference on opposing components were retained so as to not sacrifice important content validity: We examine the potential effect of our programs and policies on different population

Table 1. Scales for Organizational Leadership for Health Promotion, Pattern for Final Items: Loadings After Varimax Rotation (Alpha If Item Deleted)

Items (18)	Scales			
	Component 1 Practices for Organizational Learning ($\alpha = .91$)	Component 2 Wellness Planning ($\alpha = .86$)	Component 3 Workplace Milieu ($\alpha = .79$)	Component 4 Organizational Member Development ($\alpha = .80$)
Component 1 (6 items)				
The organization:				
Has mutual adjustments between departments	.81 (.89)			
Engages in interorganizational learning	.75 (.89)	.32		
Rewards people for a variety of innovative and broad activities	.69 (.90)	.38		
Has open information systems	.69 (.89)			
Has participative policy making	.69 (.89)		.37	
Has a learning culture and climate	.68 (.89)	.34		
Component 2 (6 items)				
It is easy to get timely information about issues, activities, and processes that affect how we do our work				
Vision is continually updated based on changes in the environment		.77 (.84)		
Policies, programs, and budgets reflect the values and principles of the wellness model		.66 (.86)		
We have well-understood expectations and strategies for how we communicate internally and externally	.32	.65 (.84)		
We devote adequate time to long-range planning	.34	.65 (.83)		
We examine the potential effect of programs and policies on different population groups	.37	.62 (.83)		
	.46	.61 (.83)		

(continued)

Table 1 (continued)

	Scales			
	Component 1 Practices for Organizational Learning ($\alpha = .91$)	Component 2 Wellness Planning ($\alpha = .86$)	Component 3 Workplace Milieu ($\alpha = .79$)	Component 4 Organizational Member Development ($\alpha = .80$)
Items (18)				
Component 3 (3 items)				
People care about one another			.78 (.69)	
Honesty and trustworthiness characterize our relationships		.50	.65 (.74)	
We are encouraged to critically reflect on our work	.33		.64 (.73)	
Component 4 (3 items)				
Have professional development policies				.83 (.79)
Professional development efforts sufficient to meet our needs				.81 (.66)
Opportunities are provided for individuals to develop personally and professionally			.39	.68 (.74)
<i>n</i>	129	118	127	129
Maximum % of total variance	23.0	19.5	13.0	12.9 = 68.4%
Eigenvalue	4.14	3.51	2.35	2.33

Table 2. Scale Statistics for Organizational Leadership for Health Promotion: Averaged Component Scores ($n = 144$)

	Component 1 (C1) $n = 129$	Component 2 (C2) $n = 118$	Component 3 (C3) $n = 127$	Component 4 (C4) $n = 129$
Intercorrelations				
C1: Practices for Organizational Learning	—			
C2: Wellness Planning	.75*	—		
C3: Workplace Milieu	.68*	.67*	—	
C4: Organizational Member Development	.54*	.50*	.55*	—
Mean	2.85	2.78	3.33	3.06
SD	0.81	0.77	0.77	0.82
Number of items	6	6	3	3
Reliability (α)	.91	.86	.79	.80

* $p < .01$.

groups in Component 2, Wellness Planning, and honesty and trustworthiness characterize our relationships in Component 3, Workplace Milieu. The varimax rotation loadings for the four leadership scales ranged from .61 to .83 and together accounted for 68.4% of the variance. (The initial unrotated analysis and scree test results also yielded a similar four-factor structure with respective eigenvalues of 8.90, 1.51, 1.22, and 1.10 for Components 1-4.) Internal consistency of these scales as measured by Cronbach's alpha ranged between .79 and .91.

Pearson correlation coefficient testing of the scales revealed a bivariate component score correlation range of .50 to .75, significant at the .01 level (2-tailed). Table 2 displays these component score intercorrelations together with scale statistics for each leadership component including its mean, standard deviation, number of items, and alpha.

In summary, PCA extracted four components from the two original leadership scales (33 items), which measured (a) the current level of practices characteristic of organizational involvement in HP and (b) the current level of practices for organizational learning. Of these two original scales, the latter was confirmed, and the former was reduced to three subscales. The resultant four components (18 items), thought to reflect underlying processes of organizational leadership for HP, were examined for content and interpreted as (a) Practices for Organizational Learning, (b) Wellness Planning, (c) Workplace Milieu, and (d) Organization Member Development.

DISCUSSION

This study developed measures of organizational leadership for HP and tested their construct validity in the baseline AHHP Organizational Survey of the 17 RHAs in Alberta, Canada. Analyses indicate the organizational leadership scales have good content and construct validity, which can be attributed to the strength of the face and content validity processes undertaken by other Canadian provincial heart health initiatives such as Saskatchewan, Ontario, and Nova Scotia. Furthermore, PCA results supported the

unidimensionality of the scales with good to high internal consistency (Oppenheim, 1992). Most of the Pearson's correlation coefficients for the majority of the components reflected moderate, positive relationships thus further supporting the distinctness of the scales. One coefficient above the upper limit (i.e., .70; Tabachnick & Fidell, 1996), however, was accepted given the developmental nature of these measures thereby preserving scale content validity at the expense of scale collinearity (Tabachnick & Fidell, 1996). This study contributes to the literature in that few instruments (Hawe et al., 2000) of this type have published psychometric data in this area.

From a theoretical perspective, these four leadership components relate to Day's (2001) conceptualizations on leadership, which propose that complex organizations require both individual leader development as well as collective leadership development linked to a broader organizational strategy. That is, within the adoption of a strategic focus on addressing widespread heart health-related morbidity and mortality in Alberta's RHAs, the components of Practices for Organizational Learning (Component 1), Wellness Planning (Component 2), Workplace Milieu (Component 3), and Organization Member Development (Component 4) can contribute to creating organizational conditions that foster HP actions on this organizational imperative. Specifically, items in each of Components 1, 2, and 3 relate to interpersonal processes that foster organizational learning, planning for wellness, and a workplace climate that supports positive relations and reflective practice, whereas Component 4 addresses individual development at both a personal and professional level. All of these can be used to test relationships with RHA action on population heart health. Moreover, measurement of these four components could thus assist in the testing of theoretical suppositions related to leader and leadership development in complex organizations such as RHAs. The four components can also be linked to Yukl and Van Fleet's (1992) notion of leadership as a process of influencing organizational members to action on organizational goals. That is, with a focus on HP/HHP, interventions related to building capacity for leadership in health care contexts could be tested in terms of specific processes (i.e., these four components) and actions on stated HP/HHP goals.

The organizational leadership for HP components also relate to Marion and Uhl-Bein's (2001) supposition on the basis of complexity theory that emergent structures (i.e., innovations) in and between systems are produced by a combination of microdynamic and macrodynamic forces. That is, these four components can be seen as part of microdynamic forces in and between organizations such as RHAs in which interactions between individuals in various parts of their systems and subsystems lead to bottom-up innovations (i.e., emergent structures) on heart health. Furthermore, via the development of organizational practices suggested by the four leadership components, executive-level leadership, as described by these authors, can be seen as enabling RHA organizational conditions that support such emergent structures (i.e., heart health innovations) to evolve. Based on this premise, member leaders developed in such conditions at various levels will be enabled to create innovations that address additional key public health issues through networks developed across RHAs via tools such as the AHHP. The leadership scales are therefore potentially useful for the evaluation of organizational leadership for HP by health service practitioners, administrators, and board members who aim to increase organizational capacity to do HP. The leadership scales can also be used in conjunction with the scales of Will to Act and Infrastructure (Anderson et al., 2004) to test theoretical models of organizational HP, as presented in the Alberta model (Smith et al., 2001).

There are also a number of limitations and suggested directions for future research that must be considered. First, the leadership for HP components is derived from a specific

data set with a modest sample size ($n = 144$) and therefore may not be generalizable across all contexts (Ebbesen, Heath, Naylor, & Anderson, 2004). Additional analyses are required to examine instrument stability over other larger and dissimilar samples. Second, there may be artifacts related to the method of PCA with multicollinearity issues arising in subsequent use of quantitative analyses such as regression techniques. Several authors suggest that consistent results using various methods of extraction and rotation reduce the problem of method artifact (Harris, 1975; Nunnally, 1978). Thus, again, additional testing of the data set as well as additional samples with other factorial analytic techniques are advised to replicate our findings. This strategy could be incorporated into test-retest and parallel-forms testing of the stability of the instrument (Streiner & Norman, 1995). Third, the survey approach to assessment of leadership at the organizational level limits score results to measurement of respondent perceptions and may also be limited by respondent ability to assess leadership at the organization-wide rather than dyadic leadership level. This query could be further illuminated by research approaches that compare the relationship of respondent ratings on RHA organizational leadership for HP with respondent ratings of their immediate supervisor. Discriminant validity testing could also be addressed via use of a social desirability scale given the possibility that respondents may answer in a socially desirable manner to protect their organization.

Finally, the complex and intricate environments of health care settings are difficult to assess from a purely quantitative perspective. Combined quantitative and qualitative research approaches are recommended to comprehensively examine organizational leadership for HP. Drawing from the strengths of each method to assist the utilization of the other can enable a more robust evaluation of the construct (Sieber, 1973). Furthermore, current recommendations encourage a combined-methods focus on critical issues in the measurement of capacity for HP (Ebbesen et al., 2004; Joffres et al., 2004). Synergistic research perspectives are vital to advance knowledge on organizational leadership for HP through ongoing construct and criterion-related validity testing of these new measures together with in-depth qualitative exploration of associated contextual nuances.

With prudent consideration of the above issues, the developed measures may be used to identify influencing factors related to leadership for HP in RHA organizations and to support design of promising interventions in building capacity for HHP actions. For example, tracking a specific leadership development focus on HP outcome evaluation skills could help strengthen an organization's ability to assess the impact of HHP programs on community health and thus contribute to effective refinement of such HHP interventions. The scales may therefore be useful to both HP education researchers and practitioners to (a) examine and develop leadership for HP at different levels within organizations and (b) track changes in organizational leadership for HP over time in relation to impacts on community health. Last, researchers can use the leadership measures to test suppositions, for example, with respect to the dimensions of will and infrastructure and RHA capacity for HP/HHP actions as per the Alberta model.

In conclusion, the development of these organizational leadership measures is an important step in the design of capacity assessment instruments and enables evaluation of key relationships in developing health sector capacity for HP. Health practitioners can use these scales to establish priorities for their own leadership development for HP. Administrators and board members can use them to set and evaluate organizational priorities on building leadership capacity for effective community HP interventions. Evidence related to organizational leadership for HP and such capacity building can ultimately assist health care practitioners, administrators, and board members to address serious population health issues such as CVD-related morbidity and mortality.

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