Stages of Physical Activity in the Alberta Population

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In Canada, the descriptive epidemiology of physical activity has traditionally been conducted by means of representative population-based survey research.¹⁻³ Information available from these surveys provides important benchmarks for the examination of lifestyle behaviours in the general population and aids the development and evaluation of health promotion strategies aimed at increasing the activity levels of specific populations. Typically, however, the assessment of physical activity in population-based research has lacked a theoretical approach. Citing disappointment with static models of behaviour, a number of researchers in the area of health psychology^{4,5} and exercise adherence⁶ have argued for a 'dynamic' approach to the study of behaviour and behaviour change.

The transtheoretical model of behaviour change^{7,8} is one approach to obtaining a dynamic view of the processes underlying behavioural change at the individual level. The model, initially developed from research on the cessation of negative behaviours such as smoking,⁹ alcohol,¹⁰ substance abuse,¹¹ and weight management,¹² has recently gained widespread acceptance in the study of the acquisition of behaviours such as the adoption of a physically active lifestyle.¹³⁻²¹ The model proposes that individuals in the process of

attempting to change their behaviour, move in a fluid and dynamic manner through a number of different levels or 'stages.'¹¹

The current paper presents an algorithmic approach, grounded in a theory currently prevalent in the study of behaviour and behavioural change, to the assessment of physical activity in a population-based sample. The paper presents the 'stages' of physical activity behaviour for the Alberta population for 1995 and 1997.

METHOD

The data for this study were collected by the research team at the Alberta Centre for Well-Being as part of regular and repeated surveillance of activity levels in the provincial population. Questions were incorporated in the 1995 and 1997 Alberta Surveys²² conducted by the Population Research Laboratory at the University of Alberta in Edmonton, Alberta, Canada. The populations sampled included all persons, aged 18 years and over, who were living in a dwelling unit in Alberta that could be reached by direct dialing at the time of each survey. The response rates for the entire sample were 73% in 1995 and 62% in 1997. The total sample size was 1,240 individuals in 1995 and 1,206 in 1997.

Physical activity assessment

For the purposes of this paper, physical activity was operationalized as activity done in the respondent's leisure time, three or more times per week, for 20 minutes or more each time and at a level that causes accelerated breathing but at which talking is still possible. Although this definition is identical to that used in previous research describing the activity levels of

Canadians,¹⁻³ it should be noted that the selected criterion is more stringent than has been recently promoted in the active living community. As such it will allow for indirect comparison to previous Canadian research but will classify people as being less active than would a more liberal operationalization of the definition.

Measures

Based on participant responses, individuals were categorized as being in one of five stages (precontemplation, contemplation, action, maintenance or relapse). Although preparation is a stage often included in the transtheoretical model, it was not categorized in this study due to the difficulty of succinctly assessing by means of telephone interview the wide range of behaviours potentially categorizing preparatory behaviour. In addition to the five stages, information was gathered that enabled classification of individuals in relapse into either relapse-precontemplation, or relapse-contemplation. The response classifications are depicted in algorithm form in Figure 1.

Concurrent validity

A measure of concurrent validity for the staging algorithm was obtained in the 1995 survey by the simultaneous application of the physical activity measures from the 1991 General Social Survey³ (GSS). The GSS questions were temporally removed from the staging questions in the body of the survey to reduce proximal response bias. A significant correlation ($\rho=0.611$, $p<0.01$) between ranked stages of physical activity and the GSS activity classifications provided a measure of concurrent validity for the algorithmic approach to the staging of physical activity.

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TABLE I
Percentage of Alberta Population in Selected Stages of Physical Activity Behaviour ($\pm 95\%$ Confidence Interval)

		Precontemplation	Contemplation	Action	Maintenance	Relapse (Precontemplation)	Relapse (Contemplation)
Total Sample	1995	20.0 (± 2.2)	10.3 (± 1.7)	7.8 (± 1.5)	44.0 (± 2.8)	1.6 (± 0.7)	16.2 (± 2.1)
	1997	17.2 (± 2.1)	10.2 (± 1.7)	6.4 (± 1.4)	48.5 (± 2.8)	2.7 (± 0.9)	14.9 (± 2.0)
Gender							
Male	1995	18.6 (± 3.1)	8.8 (± 2.3)	6.0 (± 1.9)	46.2 (± 4.0)	2.0 (± 1.1)	18.1 (± 3.1)
	1997	16.6 (± 3.0)	8.3 (± 2.2)	5.5 (± 1.8)	51.2 (± 4.0)	3.4 (± 1.5)	15.0 (± 2.9)
Female	1995	22.3 (± 3.3)	11.5 (± 2.5)	8.7 (± 2.2)	42.1 (± 3.9)	1.3 (± 0.9)	14.2 (± 2.7)
	1997	17.8 (± 3.0)	12.0 (± 2.6)	7.4 (± 2.1)	45.9 (± 4.0)	2.1 (± 1.1)	14.8 (± 2.8)
Age Group (years)							
<30	1995	8.4 (± 3.3)	5.3 (± 2.6)	10.2 (± 3.6)	55.8 (± 5.9)	1.6 (± 1.5)	18.7 (± 4.6)
	1997	8.3 (± 3.3)	10.6 (± 3.6)	7.0 (± 3.0)	53.3 (± 5.9)	2.6 (± 1.9)	18.2 (± 4.6)
30-39	1995	16.1 (± 3.9)	12.4 (± 3.5)	6.0 (± 2.5)	46.4 (± 5.3)	1.5 (± 1.3)	17.5 (± 4.0)
	1997	14.8 (± 3.8)	8.7 (± 3.0)	7.5 (± 2.8)	50.2 (± 5.4)	3.6 (± 2.6)	15.2 (± 3.9)
40-54	1995	22.9 (± 4.6)	10.4 (± 3.3)	7.5 (± 2.9)	39.6 (± 5.3)	1.7 (± 1.4)	17.8 (± 4.2)
	1997	22.0 (± 4.5)	14.0 (± 3.8)	6.0 (± 2.6)	39.0 (± 5.3)	3.8 (± 2.1)	15.1 (± 3.9)
55+	1995	34.2 (± 5.5)	11.8 (± 3.7)	6.1 (± 2.8)	35.3 (± 5.5)	2.6 (± 1.8)	10.0 (± 3.5)
	1997	24.0 (± 4.2)	6.9 (± 2.5)	5.3 (± 2.2)	51.9 (± 4.9)	0.6 (± 0.8)	11.3 (± 3.1)
Annual Household Income							
<\$26K	1995	26.9 (± 5.0)	9.2 (± 3.3)	6.9 (± 2.9)	42.9 (± 5.6)	1.0 (± 1.1)	13.2 (± 3.8)
	1997	24.0 (± 6.3)	13.1 (± 5.0)	6.9 (± 3.8)	38.7 (± 7.2)	4.5 (± 3.1)	12.9 (± 5.0)
\$26-\$45K	1995	22.0 (± 4.8)	14.0 (± 4.0)	10.2 (± 3.5)	41.1 (± 5.7)	0.3 (± 0.6)	12.3 (± 3.8)
	1997	16.3 (± 4.7)	10.2 (± 3.8)	5.3 (± 2.8)	52.0 (± 6.3)	1.7 (± 1.6)	14.5 (± 4.4)
\$45-\$70K	1995	18.6 (± 4.9)	11.6 (± 4.0)	5.6 (± 2.9)	40.2 (± 6.1)	3.5 (± 2.3)	20.5 (± 5.0)
	1997	15.8 (± 4.7)	8.2 (± 3.6)	7.9 (± 3.5)	48.6 (± 6.5)	1.8 (± 1.7)	17.8 (± 5.0)
>\$70K	1995	15.6 (± 3.6)	7.2 (± 2.5)	6.8 (± 2.5)	49.5 (± 4.9)	2.6 (± 1.6)	18.3 (± 3.8)
	1997	11.3 (± 3.6)	10.5 (± 3.5)	5.8 (± 2.7)	52.8 (± 5.7)	4.3 (± 2.3)	15.3 (± 4.1)

RESULTS

Using the algorithm as the basis for classification, individuals were initially placed into one of six mutually exclusive stages of physical activity. Subsequent breakdowns of the total sample were made by gender, age, and income groupings. For age and income groups, the total sample was divided into rough quartiles to allow sufficient sample size for comparison. For the total sample and each subsequent sub-sample, 95% confidence intervals were calculated (Table I).

In summary, 52% of Albertans reported being regularly active to the predefined level in 1995 and 55% in 1997. These numbers include those Albertans who had maintained an active lifestyle for at least the six-month period prior to the survey (Maintenance), and the portion of the population who had initiated this level of physical activity within the six-month period preceding the study (Action). Consequently, slightly over 48% of the provincial population were not active to the predefined level in 1995 and 45% in 1997. This includes those classified as Precontemplators, and those identified as

being in the Contemplation stage. Overall 18% of the total sample were classified as being in relapse in 1995 and 20% in 1997. In each sub-sample of the population, it should be noted that the majority of individuals in relapse were contemplating the re-initiation of regular physical activity involvement.

Knowledge regarding the behavioural status of select population segments is a key step in the development of program planning in health promotion.²² The results of the present paper can be utilized to segment the population for purposes of social marketing of physical activity²³ or as the behavioural and environmental diagnosis of the population in the implementation of the PRECEDE/PROCEDE model.²⁴ Regular and repeated surveillance of the population must be continually carried out to provide information regarding the overall effectiveness of any promotional efforts currently in use to increase activity at the level of the population. Use of theoretically based information, such as that presented here, provides direction to individuals involved in the monitoring and promotion of physical activity.

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Figure 1. Algorithm for the staging of physical activity behaviour.