

## Adopting an evidence-based lifestyle physical activity program: dissemination study design and methods

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### Abstract

There is a scarcity of research studies that have examined academic–commercial partnerships to disseminate evidence-based physical activity programs. Understanding this approach to dissemination is essential because academic–commercial partnerships are increasingly common. Private companies have used dissemination channels and strategies to a degree that academicians have not, and declining resources require academicians to explore these partnerships. This paper describes a retrospective case–control study design including the methods, demographics, organizational decision making, implementation rates, and marketing strategy for Active Living Every Day (ALED), an evidence-based lifestyle physical activity program that has been commercially available since 2001. Evidence-based public health promotion programs rely on organizations and targeted sectors to disseminate these programs although relatively little is known about organizational-level and sector-level influences that lead to their adoption and implementation. Cases ( $n=154$ ) were eligible if they had signed an ALED license agreement with Human Kinetics (HK), publisher of the program's textbooks and facilitator manuals, between 2001 and 2008. Two types of controls were matched (2:2:1) and stratified by sector and region. Active controls (control 1;  $n=319$ ) were organizations that contacted HK to consider adopting ALED. Passive controls (control 2;  $n=328$ ) were organizations that received unsolicited marketing materials and did not initiate contact with HK. We used Diffusion of Innovations Theory constructs as the basis for developing the survey of cases and controls. Using the multi-method strategy recommended by Dillman, a total of  $n=801$  cases and controls were surveyed. Most organizations were from the fitness sector followed by medical, non-governmental, governmental, educational, worksite, and other sectors with significantly higher response rates from government, educational, and medical sectors compared with fitness and other sectors, ( $p=0.02$ ). More cases reported being involved in the decision to adopt ALED ( $p<0.0001$ ). Data indicate that a low percentage of controls had ever heard of ALED despite repeated marketing and offering other types of physical activity programs and services. Finally, slightly

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### Implications

**Practice:** Implications for practitioners are to increase knowledge of evidence-based programs that may be useful to their organization mission and constituents, and to provide input to commercial entities that are marketing evidence-based programs on key factors that impact adoption and implementation.

**Policy:** Implications for policy makers are to provide funding for further studies of dissemination to better understand commercial–academic partnerships that are increasingly promulgated to expand the reach of prevention programs to improve health.

**Research:** Implications for researchers includes developing for dissemination by clearly identifying the target audience for marketing purposes to improve reach and adoption, and providing tools for implementers on strategies to improve the frequency of use of the evidence-based program.

over half of the adopters reported they had actually implemented the ALED program. Dissemination research requires new perspectives and designs to produce valid insights about the results of dissemination efforts. This study design, survey methods and theoretically based questions can serve as a useful model for other evidence-based public health interventions that are marketed by commercial publishers to better understand key issues related to adoption and implementation of evidence-based programs.

### Keywords

Evidence-based, Diffusion theory, Organization, Sector, Physical activity, Lifestyle physical activity

The last two decades have seen tremendous growth in the number of evidence-based programs for public health and clinical practice, but few

studies have examined the process of disseminating those programs to stimulate adoption across sectors of organizations. Sector-based marketing is a standard of practice in industries that market products and services to organizational decision makers. Academicians, however, have little experience in sector-based dissemination strategies for reaching and affecting organizational decision makers [1, 2]. Increasingly, dissemination strategies are called for as objects of study and measurement because of the promise they hold for achieving broad reach through their communication to many potential adopters [3–5]. While the number of studies about dissemination is increasing for innovations in public health [6] and clinical practice [7–9], few studies have examined academic–commercial partnerships as a means to propel evidence-based programs broadly to the attention of organizational decision makers, particularly related to evidence-based physical activity programs [2, 10]. Marketing perspectives and approaches have been advocated by behavioral and health communication scientists to disseminate evidence-based programs to achieve a broader societal impact [11, 12]. However, these approaches present challenges for researchers. The partnerships must exist in order to be studied. The commercial company must supply data about their marketing efforts so that researchers can understand how organizational decision makers learn about evidence-based programs, what sorts of follow-up takes place between marketing representatives and potential adopters, and the degree of post-purchase support provided by the commercial company on behalf of the academic product.

We used concepts from Diffusion of Innovations Theory (DIT) [13] to shape our study questions and hypotheses concerning the efforts of a commercial company, Human Kinetics, Inc. (HK) to market Active Living Every Day (ALED) [14–16]. HK was marketing the ALED program prior to the start of the current study, and their marketing efforts were not informed by DIT theory or approaches. However, DIT is an appropriate theory to develop a survey and frame an analysis of HK's marketing efforts. *Diffusion* is the process by which an innovation is communicated over time among the members of a social system [13]. Change agencies, including private companies, seek to disseminate innovative products or services to potential adopters in social systems in the hope that their efforts will precipitate a diffusion effect among potential adopters that include characteristics of awareness, inquiry, trial, adoption, implementation, and sustained use. Change agencies, like HK, disseminate information about innovations; in response, potential adopters talk and observe each others' responses to the innovation in order to decide how they should respond by adopting, rejecting, ignoring, or taking a wait-and-see attitude toward the innovation. So dissemination is not necessarily a more active or purposive form of diffusion; it is the logical ante-

cedent to the diffusion response among potential adopters as they decide what to do when stimulated by an offer from a change agency such as a company, a federal agency, a private foundation, or other source or sponsor of innovations [17].

In the physical activity area of health behavior change, there have been some studies of individual level influences, most notably focusing on self-efficacy [18, 19], and investigations of environmental influences [20–24]. However, sector-level and organizational influences have not been well studied [25, 26]. The lack of such studies represents a major gap in our knowledge of the factors within and among organizations about the decision-making and social influence processes leading to adoption of an evidence-based program. Thus an important first step is to develop models for the study of the academic–commercial partnership, and to provide the fundamental descriptive information about the adoption and implementation process by organizations in a variety of sectors which are the real-world objects of commercial marketing activities. For example, how do organizations learn of evidence-based programs? What persuades them to adopt, evidence of program effectiveness or imitative pressures from the actions of sector competitors? What is the decision-making process for adopting or not adopting a lifestyle physical activity program like ALED? How does this program fit with other programs and services offered by adopting organizations, particularly in more traditional sectors like the fitness sector? The workings of complex organizations such as colleges or public health agencies, and the social and peer influences across organizations such as health clubs may be important contributors to the fate of an evidence-based physical activity program [12].

Active Living Every Day is an ideal evidence-based physical activity program to study dissemination. It represented an important and early innovation in the promotion of physical activity as one of the first tests of a behaviorally based lifestyle physical activity program aimed at increasing moderate to vigorous physical activity in sedentary adults [27]. It was a shift from an “Exercise Training-Physical Fitness” paradigm, where one goes to a special place at a special time often in special clothes, to a “Physical Activity Health” paradigm, where the object is increased moderate activity levels throughout the course of a day [28]. Efficacy was established in a randomized trial [15, 29, 30]. A subsequent Robert Wood Johnson Foundation (RWJF) translational trial, Active for Life, showed effectiveness of ALED in community settings [16, 31].

A commercial publisher, HK markets the ALED program materials to organizations representing a variety of sectors, including fitness centers, work-sites, schools and universities, and departments of public health allowing for comparisons of sectors. Using diverse marketing approaches, the commercial dissemination efforts by HK provided an

opportunity to examine organizational and sector-level influences on program adoption and implementation. Investigators on this study were able to establish an academic–commercial partnership with HK to obtain contacts of both adopters and non-adopters of the ALED program.

This paper describes the retrospective research design used to study the commercial dissemination of ALED, particularly the organizational and sector factors that may have influenced the adoption and implementation according to DIT. Descriptions of study methods include the derivation of the study sample using data made available through an agreement with HK, descriptions of sectors, and matching of cases with controls. Data of response rates by sector, including demographics for cases and controls are reported. In addition, fundamental descriptive data for both cases and controls are presented about organizational decision making for adoption and about other types of physical activity programs and services. For controls only, data is provided on knowledge of ALED and how directors learned of it through a variety of active marketing efforts and passive word of mouth. Finally, for cases only, data on implementation of the ALED program is provided. Future papers will describe results of the hypothesis testing based on Diffusion of Innovations Theory, factors that influenced organizational decision making related to adoption of ALED, and adaptations made to the program and the extent to which ALED has been sustained.

## METHOD

### Background of the study: case–control study design and randomization

Active Living Every Day has been disseminated by HK since 2001 and is distributed as an individual workbook with online resources for participants [14]. An online and webinar facilitator training process provides preparation to adopting organizations for program delivery. Organizations from the U.S.A., Canada, U.K., and Australia have become providers of ALED.

A case–control design was implemented due to the retrospective nature of the information to classify the organizations. Cases were defined as U.S. organizations that had signed a license agreement for ALED with HK between 2001 and 2008. Organizations of the original program developers and all organizations that served in the RWJF translational study were not included in the sample since they received additional technical support, resources, and evaluation [31–33]. A total of 186 organizations were identified as cases (i.e., adopters) by HK's ALED program staff that provided contact information for most of these organizations. Klein Buendel (KB) research staff verified and/or updated email addresses for organizational directors. Some organizations were no longer in business, and others

would not provide email addresses or declined to participate in an online survey, leaving a total of 154 (83%) cases. The flow chart of all cases and controls is shown in Fig. 1.

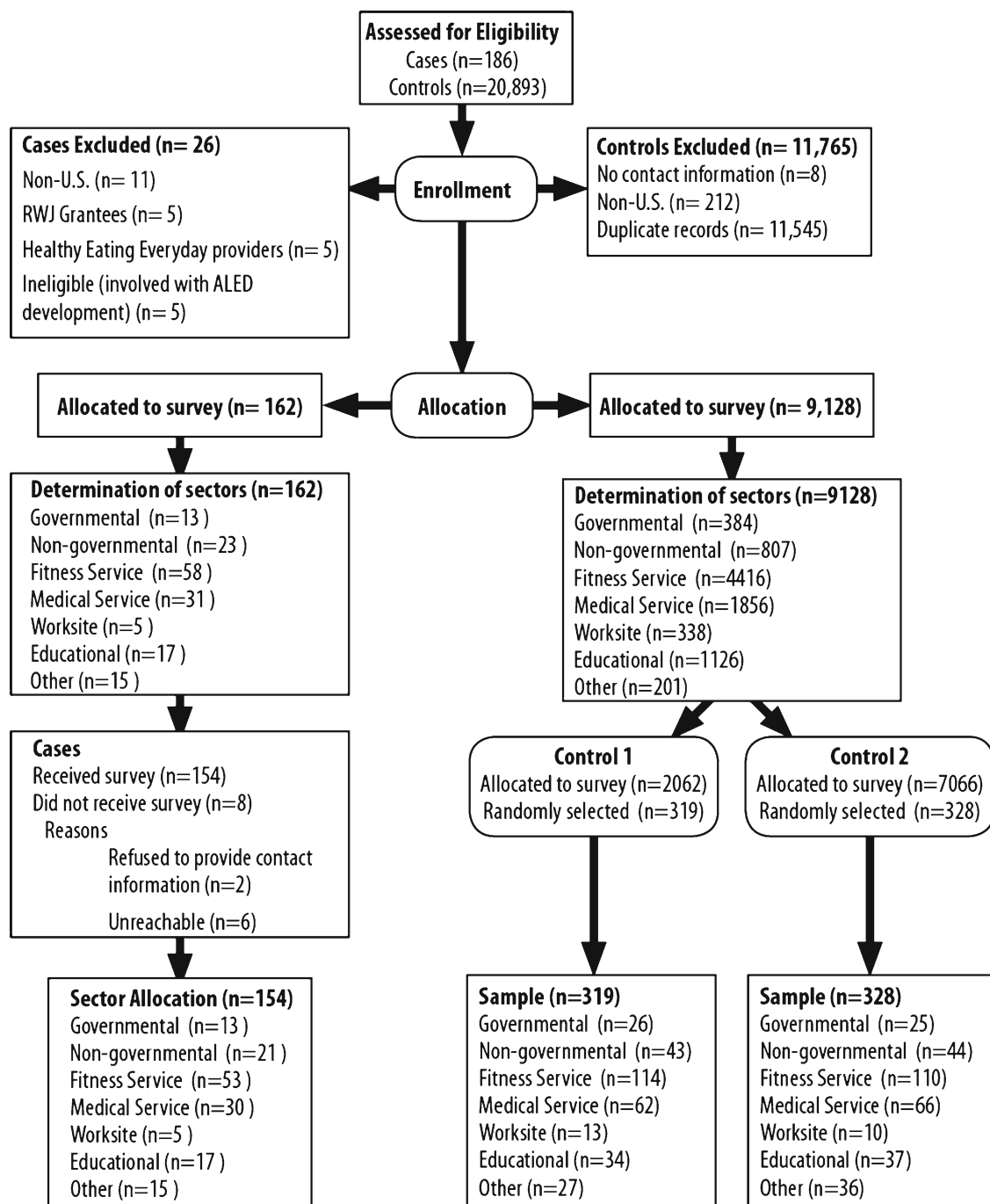
Two types of controls were identified: organizations that had contact with HK and expressed an interest in potentially adopting the ALED program (control 1) and those who only received marketing materials from HK and had no additional contact with HK (control 2). A total of 20,823 controls were identified from HK's sales and marketing databases, Goldmine and Sales-Net. KB staff eliminated all duplicate organizations to develop a final list of controls ( $n=9,128$ ) of which 2,062 with a listed contact person were determined to be control 1 organizations and 7,066, were control 2 organizations.

Both cases and controls were stratified into one of four geographic regions, Northeast, South, Midwest, and West using the taxonomy developed by the Centers for Disease Control and Prevention (CDC) and into seven business sectors defined in a Delphi process by KB project staff and investigators [34]. Sectors included: (1) governmental organizations, (2) non-governmental organizations, (3) fitness, (4) medical service, (5) worksite, (6) educational, and (7) other (see Fig. 2).

The project biostatistician performed a matched stratified randomization, matching control selection to cases based on regions and sectors. Each case was matched with two controls of each type. Email addresses for organizational directors were also searched and collected by KB staff for both types of controls following randomization. The project was reviewed by Western Institutional Review Board and received approval in November 2006.

### Case–control survey

The case–control survey was designed to collect organizational demographics and descriptive data about the services and programs offered by the organizations, the number of times organizations had offered the ALED program, and source of funding for offering ALED. In addition, survey questions were developed based on DIT constructs for adoption and implementation including organization factors of: (1) monitoring professional communications, i.e., professional associations and contacts; (2) innovation attributes, i.e., simplicity of implementation, compatibility with organizational mission, norms, and existing programs; and (3) the decision-making process, i.e., group or individual [13]. Sector-level questions assessed: (1) sector integration, i.e., communication with others in the same sector; (2) sector leadership, i.e., importance of what other organizations think; and (3) sector norms for lifestyle physical activity, i.e., services and programs offered that include lifestyle and traditional exercise [13]. Questions were the same for cases and controls, although the case survey



**Fig 1 |** This figure shows the number of cases and each control assessed for eligibility and reasons for exclusion from the final survey. It also depicts the number of cases and controls allocated to each sector

included additional implementation questions on the use of the ALED program and the controls were asked additional questions about marketing by HK.

Two rounds of cognitive interviews were conducted with individuals ( $n=8$ ) in organizations that had either offered the ALED program or received marketing materials to pretest the survey. On average, the initial draft of the survey took 18 to 25 min to complete and feedback was used to clarify questions, reorganize question order, and revise instructions. A final round of cognitive interviews resulted in only minor corrections to the survey.

A combination of online, telephone, and mail interview methods were used to deliver the survey from July 2008 to May 2009 [35]. Invitations were mailed to the senior-most directors of the organizations following verification of their email address. Invitations described the purpose, sponsorship, and confidentiality of the survey (i.e., responses would not be shared with HK), and provided a URL to the survey. The online survey was managed by Inquisite™ survey software running on a secure web server at the lead research organization. Directors who did not respond were contacted by a profes-

### ALED Sectors and Sector Descriptions

- 1. Governmental** – non-profit government organizations that offer physical activity and other types of programming at low cost/no cost to a variety of populations in the community. These include both state and local government agencies. Examples are public health departments, area councils on aging, community recreation centers, and park and recreation departments.
- 2. Non-governmental** – non-profit organizations that offer physical activity and other types of programming to members of a community. These organizations can charge a fee. Examples are YMCAs and churches.
- 3. Fitness service** – organizations that have a primary focus of fitness and sports. These are for-profit organizations or individuals that offer fitness training services. Examples are organizations like Bally's, 24 Hour Fitness and personal trainers who might work with individual clients.
- 4. Medical service** – organizations that provide any type of medical care to clients. These provide medical care through primary or secondary medical clinics, hospitals or nursing homes. Examples are doctors' offices, physical and mental health clinics and rehabilitation services.
- 5. Worksite** – non-health/medical organizations that offer wellness type programs or services to their employees. These can include large, medium and small businesses that could offer wellness services to employees.
- 6. Educational** – public or private schools or universities that provide instructional services to children and adults. These can include elementary, high school and colleges, trade and technical schools.
- 7. Other** – all organizations that do not fit into one of the six sectors listed above. Most were private wellness consultants and a small number were military organizations.

Fig 2 | This figure provides the definition for each sector surveyed

sional telephone interviewer to complete the survey, using computer-aided telephone interview software. Directors who still did not respond were sent a copy of the survey by mail, using procedures recommended by Dillman [35] that included periodic reminders. Finally, persistent non-responders were sent a copy of the survey by Fed Ex to convey increased importance of the study. All directors who completed the survey and who agreed to receive an incentive were mailed a \$50 gift card.

## RESULTS

### Participating organizations and response rates

The total number of participating organizations completing the survey was 801, with 154 cases, 319 control 1, and 328 control 2. The overall response rate for all sectors was 58%. Cases and controls were distributed primarily over the South (32%;  $n=255$ ), Midwest (30%;  $n=244$ ), and Northeast (25%;  $n=200$ ) with fewer cases in the West (13%;  $n=102$ ).

Sector distribution for participating cases and controls in order of frequency was 35% ( $n=277$ ) fitness, 20% ( $n=158$ ) medical, 13% ( $n=108$ ) non-governmental, 11% ( $n=88$ ) educational, 8% ( $n=64$ ) governmental, 10% ( $n=78$ ) other, and 3% ( $n=28$ ) worksite. Response rates exceeded 50% in all sectors except "other" (Table 1). A multiple logistic regression analysis assessing response rates found significant differences for sector,  $\chi^2$  ( $DF=6$ ,  $N=801$ )=15.11,  $p=0.02$ . Post hoc contrasts showed higher response rates in: (1) government versus fitness  $\chi^2$  ( $DF=1$ ,  $N=801$ )=5.84,  $p=0.02$ ; (2) government

versus other sectors,  $\chi^2$  ( $DF=1$ ,  $N=801$ )=5.14,  $p=0.02$ ; (3) medical versus fitness,  $\chi^2$  ( $DF=1$ ,  $N=801$ )=3.86,  $p<0.05$ ; (4) educational versus fitness,  $\chi^2$  ( $DF=1$ ,  $N=801$ )=6.91,  $p=0.01$ ; and (5) educational versus other,  $\chi^2$  ( $DF=1$ ,  $N=801$ )=4.43,  $p=0.04$  using unadjusted  $p$  values.

Surveys were obtained primarily via the online survey system ( $n=321$ ; 70%). Telephone interviewers obtained responses from an additional 76 (16%). Another 42 organizations (9%) responded by mailed surveys and 19 more organizations (4%) completed the survey online after they were contacted and sent the mail survey. Finally, three organizations (<1%) completed the survey as sent by Fed Ex.

### Demographic and decision making by cases and controls

Table 2 shows the organizational characteristics of responding organizations and demographics of the responding directors who were mostly college-educated, middle-aged females.

Close to one third of cases and controls (29.5%;  $n=136$ ) reported they were involved in the decision to adopt or not adopt ALED ( $n=136$ ). Involvement in the decision-making process by directors at case organizations ( $n=86$ ) was significantly higher than control 1 ( $n=36$ ) and control 2 ( $n=18$ );  $\chi^2$  ( $DF=2$ ,  $N=186$ )=15.12,  $p<0.001$ . A total of 184 cases and controls had knowledge of the decision-making process though they may not have been directly involved in the adoption decision. Whether the decision to adopt was a group or individual, decision was equally split overall for the decision-making process (50%;  $n=$

**Table 1** | Number of surveys, responses, and response rate by sector and group

Sector	Group	Completed surveys	Total surveys	Response rate (%)
Governmental	Cases	12	13	92.3
	Control 1	15	26	57.7
	Control 2	17	25	68.0
	Overall	44	64	68.8
Non-governmental	Cases	12	21	57.1
	Control 1	26	43	60.5
	Control 2	23	44	52.3
	Overall	61	108	56.5
Fitness service	Cases	30	53	56.6
	Control 1	52	114	45.6
	Control 2	57	110	51.8
	Overall	139	277	50.2
Medical service	Cases	19	30	63.3
	Control 1	42	62	67.7
	Control 2	37	66	56.1
	Overall	98	158	62.0
Worksite	Cases	2	5	40.0
	Control 1	8	13	61.5
	Control 2	9	10	90.0
	Overall	19	28	67.9
Educational	Cases	14	17	82.4
	Control 1	25	34	73.5
	Control 2	23	37	62.2
	Overall	62	88	70.5
Other	Cases	8	15	53.3
	Control 1	17	27	63.0
	Control 2	13	36	36.1
	Overall	38	78	48.7
All sectors	Cases	97	154	63.0
	Control 1	185	319	58.0
	Control 2	179	328	54.6
	Overall	461	801	57.6

**Table 2** | Profile of responding organizations and directors

Characteristic	Case n=97	Control 1 n=185	Control 2 n=179	Total n=461
<i>Organizations</i>				
Number of employees (M±SD)	534±752	489±721	460±645	488±699
Number of departments (M±SD)	28±66	26±57	23±51	25±57
Number of sites (M±SD)	12±46	9±21	11±42	10±36
<i>Directors</i>				
Gender (% female)	79.4	71.9	68.7	72.2
Age (years) (M±SD)	45±9.8	47±10.9	48±11.7	47±11.0
Years in position (M±SD)	6.2±5.2	7.6±5.8	7.8±6.8	7.4±6.8
Education (%)				
Less than college	7.22	12.43	10.06	10.41
College graduate and postgraduate	92.78	87.57	89.94	89.59
Race (%)				
American Indian/Alaska Native	0.0	2.7	0.6	1.3
Asian	0.0	1.1	1.1	0.9
Black/African American	8.2	2.7	6.1	5.2
Native Hawaiian/Pacific Islander	0.0	0.6	0.6	0.4
White	91.8	91.3	90.5	91.1
More than one race	0.0	1.6	1.1	1.1
Ethnicity (%)				
Hispanic/Latino	1.0	2.2	2.2	2.0
Not Hispanic/Latino	99.0	97.8	97.8	98.0

92 for both group and individual decision making for cases and controls). Group decision making (as opposed to individual) did not differ among cases and the two controls (56.3%, 42.6%, and 44.1%,  $\chi^2$  ( $DF=2$ ,  $N=184$ )=3.16,  $p=0.21$ ).

Most organizational directors said they offered other physical activity programs besides ALED (91% ( $n=87$ ) of cases; 90% ( $n=165$ ) of control 1; 93% ( $n=165$ ) of control 2). Both cases and controls had mostly created their own classes (77% cases; 82% control 1; 75% control 2). Tables 3 and 4 show what other types of other physical activity programs and services are being offered by cases and controls and by the fitness sectors compared with all other sectors. Fitness sectors were compared to other sectors because the mission of this sector differs from other sectors, and because it represented the largest sector compared with all others.

#### Marketing of ALED to controls 1 and 2

Despite not adopting ALED, 31% ( $n=55$ ) of directors at control 1 organizations reported that they had heard of ALED compared with 19% ( $n=34$ ) of those at control 2 organizations. Controls reported learning of ALED through a variety of different marketing efforts by HK, most commonly in catalogs, direct mail for HK training conferences, conference presentations and trade show displays, articles in newspaper and trade magazines, or direct contact through organizational contacts or program repre-

sentatives (Table 5). A higher percentage of directors at control 1 organizations appeared to consider adopting ALED (64%,  $n=35$  considered or seriously considered) compared with at control 2 organizations (47%,  $n=16$ ), but the difference was not significant ( $\chi^2$  ( $DF=1$ ,  $N=89$ )=2.36,  $p=0.12$ ).

#### Implementation of the ALED program by cases

Among cases, 54% ( $n=52$ ) reported they had ever offered ALED. There was a steady increase in the number of organizations that offered ALED from 2001 to 2006 (6% in 2001, 11% in 2003 and 2004, 20% in 2005, and 32% in 2006), with a possible decline in 2007 (20%). The average number of classes offered per year per organization was two (range=1 to 10) and the average number of participants in each class was eight. Most classes were paid for by participant fees (57%), while others were paid by an employer (34%), grant (23%), or other sources of money (11%).

Cases that offered ALED between 2001 and 2006 cited the most common barriers to implementation were difficulty in recruiting participants (83%,  $n=29$ ) and the 20-week duration of the program (60%,  $n=21$ ). For a smaller percentage of cases, the staff time required to implement the program (31%,  $n=11$ ), budget (17%,  $n=6$ ), time and travel required to train facilitators (17%,  $n=6$ ), cost of materials (17%,  $n=6$ ), having sufficient computers (6%,  $n=2$ ), and reading level of materials ( $n=3$ ,  $n=1$ ) were reported as

**Table 3** | Physical activity programs offered

Physical activity programs	Fitness sector		All other sectors		Total number
	Cases	Control 1 and 2	Cases	Control 1 and 2	
	Number offered (%)				
10,000-step pedometer program <sup>a,b</sup>	5 (20.0)	34 (35.1)	32 (51.6)	66 (28.3)	137 (32.9)
Arthritis Foundation Exercise Program (Arthritis Foundation) <sup>b</sup>	7 (28.0)	23 (23.7)	15 (24.2)	65 (27.9)	110 (26.4)
America on the Move (America on the Move Foundation) <sup>b</sup>	4 (16.0)	14 (14.4)	15 (24.2)	52 (22.3)	85 (20.4)
Other physical activity programs	6 (24.0)	17 (17.5)	19 (30.7)	39 (16.7)	81 (19.4)
Silver Sneakers (Healthways)	5 (20.0)	16 (16.5)	9 (14.5)	37 (15.9)	67 (16.1)
YMCA 12-week personal fitness program (YMCA)	3 (12.0)	5 (5.2)	11 (17.7)	35 (15.0)	54 (13.0)
Choose to Move (AHA) <sup>b</sup>	1 (4.0)	2 (2.1)	6 (9.7)	32 (13.7)	41 (9.8)
Get Active America (IHRSA)	6 (24.0)	19 (19.6)	1 (1.6)	10 (4.3)	36 (8.6)
START (AHA)	0 (0.0)	5 (5.2)	3 (4.8)	17 (7.3)	25 (6.0)
Get Fit on Route 66 (AARP)	2 (8.0)	1 (1.0)	3 (4.8)	19 (8.2)	25 (6.0)
Active Choices (Stanford Health Promotion Resource Center) <sup>b</sup>	2 (8.0)	3 (3.1)	0 (0.0)	13 (5.6)	18 (4.3)
EnhanceFitness Choices (Senior Services Seattle Washington)	0 (0.0)	1 (1.0)	2 (3.2)	8 (3.4)	11 (2.6)
Step Up to Better Health (AARP)	0 (0.0)	1 (1.0)	0 (0.0)	7 (3.0)	8 (1.9)
Lift Off (UCLA School of Public Health) <sup>b</sup>	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.4)	1 (0.2)

For all programs the  $n=417$

YMCA Young Men's Christian Association; AARP American Association of Retired Persons; AHA American Heart Association; IHRSA International Health and Racquet Sport Association

<sup>a</sup> 10,000-step pedometer programs include all programs that have used step counters to increase physical activity

<sup>b</sup> Programs for which there is evidence of efficacy and/or effectiveness

**Table 4** | Physical activity services offered

Physical activity services	Fitness sector		All other sectors		Total number
	Cases	Control 1 and 2	Cases	Control 1 and 2	
	Number offered (%)				
Group fitness classes	19 (76.0)	81 (83.5)	49 (79.0)	196 (84.1)	345 (82.7)
Exercise machines	20 (80.0)	80 (82.5)	42 (67.7)	191 (82.0)	333 (79.9)
Wellness or lifestyle coaching	14 (56.0)	60 (61.9)	42 (67.7)	150 (64.4)	266 (63.8)
Personal training sessions	16 (64.0)	75 (77.3)	32 (51.6)	141 (60.5)	264 (63.3)
Recreational classes	9 (36.0)	47 (48.5)	31 (50.0)	143 (61.4)	230 (55.2)
Other services	4 (16.0)	16 (16.5)	9 (14.5)	32 (13.7)	61 (14.6)
Sport skill classes	10 (40.0)	40 (41.2)	19 (30.7)	104 (44.6)	173 (41.5)

barriers. Materials written only in English were not reported to be a problem.

Directors at 32% ( $n=31$ ) of organizations said their organization would offer ALED in the future. Directors at an additional 52% ( $n=50$ ) didn't know if they would offer it again and 16% ( $n=16$ ) reported they would not. Most organizations planning to offer ALED again said they would try to attract other groups of people to the program (55%;  $n=17$ ) or try to offer it in a different location (39%;  $n=12$ ).

## DISCUSSION

This paper describes the research design, methods, and descriptive data for the dissemination of a commercially marketed, evidence-based physical activity program, ALED. The study design is unique because it is the result of a commercial-academic partnership using data from both the publisher to provide organizational contacts and DIT constructs to design a retrospective survey. Academic research and commercial partnership have been advocated as a way to more widely disseminate evidence-based programs [11, 12]. This study begins to address a gap in knowledge of these dissemination efforts, and provides early evidence for how well such partnerships can work. The study design also may serve as a useful model for studies of other evidence-based physical activity or public health interventions that are marketed by commercial publishers.

Examination of organizational and sector-level factors is generally not considered in studies of dissemination, yet they are likely to play as important a role in dissemination as individual and environmental factors [25, 26]. For instance, descriptive data showed cases and controls were, on average, fairly large organizations with approximately 500 employees at several different sites and this may be an important moderator of the decision to adopt.

For adoption of ALED, there was no difference between cases and controls on organizational characteristics, but a significant difference was found in the decision-making process. Directors at case organizations were more involved in the decision making than at control organizations. One possible explanation is that turnover of the survey respondents was different between cases and controls; although this may not be plausible since tenure was equivalent between cases and controls. One plausible explanation is awareness of the program. Data on marketing the ALED program found that three quarters of directors at control organizations had never heard of the ALED program despite most of them offering many other physical activity programs and services. Marketing of any type of product or innovation usually takes multiple contacts to even create awareness of the product. DIT points out that use of an innovation like ALED is not likely an immediate act but rather the result of a process that happens over time and typically

**Table 5** | Source of information about the ALED program

Where did you hear of the ALED program?	Number <sup>a</sup>	Percent
Human Kinetics catalog	43	48.31
Internet search	16	17.98
Direct mail	15	16.85
Conference presentation	13	14.61
Newspaper or trade magazine article	11	12.36
Conference trade show display	11	12.36
Contact from an Active Living representative	11	12.36
Other	11	12.36
Recommendation from a colleague	6	6.74
I, or someone in my organization, contacted Human Kinetics for information	5	5.62

<sup>a</sup> Only control organizations who said they heard of the ALED program received this question,  $n=89$



requires reinforcement [13]. Perhaps HK never successfully reached the organization or a staff member with decision-making responsibility. Either way, the “decision” not to adopt the program seemed to have occurred passively because organizational directors were unaware of the program.

Data on sectors showed that the fitness industry comprised the largest sector to which HK marketed ALED. This might be expected since it is one of HK's primary markets for its products. However there were fewer responses to the survey from fitness organizations. A lower response rate from the fitness industry may have arisen because ALED did not match the sector norm for lifestyle physical activity compared with governmental, medical, and educational sectors. Fitness services incorporate structured exercise such as group fitness classes and exercise machines more than lifestyle physical activity programs of any type, although this also was true for all other sectors. This study showed low adoption of most types of lifestyle physical activity programs compared with more traditional approaches, regardless of sector type.

Cases that adopted the program did not always implement it, despite signing a license agreement and undergoing training to facilitate the program. Even organizations that implemented ALED offered only a small number of classes over the 7-year dissemination period. Implementers most often cited recruitment of participants and the length of the program (20 weeks) as barriers. Low implementation is especially discouraging because HK provided a number of program supports including comprehensive facilitator training, guidebook support website, and optional online training on administrative issues such as budgeting and marketing. In addition, HK maintains a program office and employs staff that provides technical assistance to providers. Still, respondents struggled with the administrative issues like recruitment of participants rather than class management issues. Additional support efforts may be needed to address enrollment of participants and the length of the program.

This study has a number of limitations. Most notably, it is retrospective and uses a database of organizations that was not created through random sampling of organizations within sectors. The retrospective survey relies on the memory of individuals who may or may not have been involved with the decision making at the time ALED was considered by the organization. Organizational directors seemed to be the most logical person to survey based on advice from HK and its ALED program office staff. Furthermore, it is possible that organizational directors forwarded the survey link to an administrative assistant to complete; however, we believe this was a rare occurrence based on survey compensation records indicating compensation went to the individuals surveyed.

Another limitation was the overall survey response rate of 57.6%, despite using multi-method

procedures described by Dillman [35]. The time lag between HK's marketing contacts, use of the ALED program by cases, and the survey may have depressed interest in the topic. In general, translational studies will face these types of challenges given the long time often devoted to distributing a program. Also, response rates to surveys appear to be trending downward according to a review that noted much lower response rates in 2000 compared with 1986, i.e., 24% to 64%, respectively. Authors attribute this lower response rate to the growth in the number of surveys and the increasing number of unsolicited emails that are received in the workplace and this remains an issue in the decade that followed the publication of this study [36]. Finally, there are limitations with respect to collection of data using a mixed mode data collection. The design principles recommended by Dillman [35] was used to reduce measurement differences due to survey method and while this may have led to some error in results it also likely yielded a higher response rate than if we had used any single method of data collection.

#### Implications

These results have implications for researchers who want to consider working with commercial publishers for the dissemination, diffusion, implementation, and sustainability of evidence-based physical activity programs. Commercial publishers are accustomed to marketing behavior change programs by distributing and supporting the sale of books, multimedia kits, and in some cases, training. They also have experience in advertising and audience segmentation that are essential for generating interest, offering product, and getting to adoption (a purchase decision). This may have not been done well enough in the present case, and more targeted marketing efforts to government, educational, and medical sectors may yield higher adoption rates. However, adoption appears to have been less of a problem than was implementation. To further implementation, researchers may be uniquely positioned to help publishers select markets and support and facilitate program implementation from their past experiences during the original production and evaluation of a program such as ALED. In addition, implementation strategies should receive greater emphasis when designing interventions for dissemination and practitioners should not hesitate to provide feedback to researchers and commercial publishers to ask for additional assistance when implementation issues arise.

#### Conclusions

The results presented here on adoption and implementation of organization and sector factors suggest a need for better understanding of how to more effectively work with commercial publishers to more accurately target and reach high-probability adopt-

ers who will also be well suited for implementing the innovations. Most of the organizations in the sample, cases as well as controls, offered other types of physical activity programs and services and it appears that traditional exercise models still predominate. Distributors of evidence-based programs need a better understanding of what models and programs are being used by individuals, and the organizations to which they are being marketed. Future research also needs to yield a better understanding of how to create awareness of evidence-based programs and motivate their adoption and which strategies and support will ensure successful implementation.

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