

Title: Dissemination and Stakeholder Engagement Practices Among Dissemination & Implementation Scientists: Results from an Online Survey

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Abstract

Introduction: There has been an increasing focus on disseminating research findings, but less about practices specific to disseminating and engaging non-researchers. The present project sought to describe dissemination practices and engagement of stakeholders among dissemination & implementation (D&I) scientists.

Methods: Methods to disseminate to and engage non-research stakeholders were assessed using an online survey sent to a broad, diverse sample of D&I scientists.

Results: Surveys were received from 210 participants. The majority of respondents were from university or research settings in the U.S. (69%) or Canada (13%), representing a mix of clinical (28%) and community settings (34%). 26% had received formal training in D&I. Respondents indicated routinely engaging in a variety of dissemination-related activities, with academic journal publications (88%), conference presentations (86%), and reports to funders (74%) being the most frequent. Journal publication was identified as the most impactful on respondents' careers (94%), but face-to-face meetings with stakeholders were rated as most impactful on practice or policy (40%). Stakeholder involvement in research was common, with clinical and community-based researchers engaging stakeholder groups in broadly similar ways, but with critical differences noted between researchers with greater seniority, those with more D&I training, those based in the US, and those in community vs, clinical research settings.

Conclusions: There have been increases in stakeholder engagement, but few other practices since the 2012 survey, and some differences across subgroups. Methods to engage different stakeholders deserve more in-depth investigation. D&I researchers report substantial misalignment of incentives and behaviors related to dissemination to non-research audiences.

Keywords: implementation science, dissemination, research practices, stakeholder engagement, survey

1 **Background**

2 Dissemination, defined as “an active approach of spreading evidence-based
3 interventions to the target audience via predetermined channels using planned strategies” (2), is
4 the critical process linking research findings to practitioners who can implement them, leading to
5 benefits among the people or communities of interest. Frequently recommended dissemination
6 practices to reach non-research audiences include “Designing for Dissemination” (3, 4), use of
7 multiple channels, development of guides to program implementation, and engagement of
8 multiple types of stakeholders in the development and evaluation of interventions and
9 dissemination plans. The number of publications on dissemination has increased dramatically
10 over the years (5-7) since classic work on diffusion of innovations (8). What is less known is the
11 extent to which there have been increases in the use of evidence based and best practices
12 among dissemination and implementation (D&I) researchers, and if there are differences in
13 dissemination practices across different types of D&I researchers.

14 Differences in preferred sources of information between researchers and practitioners
15 have been documented and researchers are increasingly urged to “go beyond” academic
16 publication and presentations at major professional conferences (3, 9). It is not known more
17 specifically what avenues and strategies researchers, and especially D&I researchers, use to
18 facilitate translation of their findings into practice and policy.

19 There has been a strong encouragement to meaningfully engage patients and
20 community stakeholders in research from PCORI, NIH, and other organizations (10). Two
21 relatively recent developments of interest have been use of social media and stakeholder
22 engagement practices (11, 12). While each of these has existed for decades, most health care
23 and public health researchers have not been early adopters of these approaches, we were
24 interested in what specific engagement strategies D&I researchers use and the extent to which
25 they used them.

26 The use of a variety of dissemination practices to non-research audiences (e.g.,
27 publication, meetings, webinars) has previously been described by Brownson et al. (2013). They
28 surveyed a sample of public health researchers in 2012 concerning their dissemination
29 practices, including which dissemination practices the researchers rated as most impactful, and
30 which were most aligned with incentives for career advancement. This survey provided valuable
31 information, but was seven years ago and we hypothesize that there have been significant
32 increases since then due to trends encouraging dissemination, due in part to the number of
33 newly trained D&I scientists (13-18). Additionally, the 2012 survey did not extensively assess
34 practices such as designing for dissemination or stakeholder engagement, nor did it include
35 clinical researchers or non-U.S. researchers. At that time, few researchers had received formal
36 D&I training. Thus, an updated and expanded assessment of current dissemination practices
37 was warranted.

38 The purposes of this current project were to: 1) conduct a survey conceptually similar to
39 the Brownson et al. 2012 survey by characterizing current practices of research dissemination
40 to non-research audiences among D&I researchers; 2) include a broader sample of D&I
41 scientists; 3) include additional dissemination and stakeholder engagement practices; and 4)
42 investigate potential researcher characteristics associated with greater use of various
43 dissemination strategies.

44

45 **Methods**

46 **Survey development.** The survey was developed by beginning with the Brownson et al. and
47 Tabak et al. surveys (1, 19). We adopted and, in many cases, modified questions and/or
48 response options in this survey to address 2018 priorities, evolution of the field, and a greater
49 number of dissemination practices. We also added several items related to investigator
50 characteristics and stakeholder engagement practices. The primary domains assessed included
51 dissemination practices; impressions of the impact and importance of different practices for a)

52 impact and b) promotion; stakeholder engagement practices; and respondent characteristics.

53 Due to the different and expanded sample, we also needed to modify several items (e.g., to

54 address medical as well as public health researches; Canadian and other researchers in

55 addition to U.S. researchers). Initial drafts of the survey were iteratively developed and refined

56 by team members, reviewed by original 2012 researchers, and reactions from members of key

57 target audiences. We also deleted several items to keep the survey to a reasonable length. A

58 copy of the survey, which is publicly available for others to use, is presented in Appendix A.

59 **Sampling frame.** Participants were recruited to take part in an online survey assessing self-

60 reported practices related to dissemination of findings to non-research audiences, as well as

61 methods by which respondents engage stakeholders in research to enhance translation.

62 Potential survey respondents were identified by having productivity or recent training related to

63 D&I science. Participants were recruited through a variety of organizations, lists, and avenues

64 (see Table 1). As described later, it was not possible to determine a denominator of scientists

65 invited or an accurate return rate because: a) several organizations did not allow us access to

66 mailing lists or to send individual e-mails so we did not know the number of invitations sent, b)

67 the number of incorrect e-mails, or c) the degree of overlap among the different sampling

68 sources. We expect that the latter was very large due to the number of scientists who may well

69 have been funded by D&I funders, published in *Implementation Science*, and been trained in

70 D&I research. The survey was powered through Qualtrics online survey software.

71

72 **Survey implementation.** Surveys were distributed through Qualtrics (when individual e-mail

73 addresses were available) or through electronic listservs as appropriate. Listserv distributions

74 were conducted by managers of those listservs rather than by our study personnel due to

75 confidentiality requirements. Potential participants for whom we had individual e-mail addresses

76 received up to three reminder emails at one-week intervals from April-May 2018. Responses

77 were collected anonymously and respondents did not receive any incentive for participation.

78 The project was approved by the local Institutional Review Board, including a waiver of written
79 consent.

80 **Analyses.** Primary analyses followed an *a priori* analytic plan, consisting primarily of descriptive
81 statistics, percentages, frequencies, and narrative comparisons. In instances when the analytic
82 plan called for subgroup comparisons, independent samples T-test, chi squares, and chi square
83 likelihood ratio tests were used as appropriate. Finally, logistic regression analyses were
84 performed to evaluate independent contributions of several potential respondent characteristic
85 predictors of use of high levels of stakeholder engagement. A priori predictions were that: 1) the
86 2018 sample would report greater use of dissemination practices in addition to the usual
87 publications and presentation strategies than the 2012 sample; 2) those receiving formal D&I
88 research training would engage in more dissemination practices and more stakeholder
89 engagement activities than those not; and 2) that Canadian researchers would make greater
90 use of stakeholder engagement practices than U.S. researchers. The majority of remaining
91 analyses were descriptive and exploratory in nature.

92

93 **Results**

94 **Respondents.** Surveys were received from 210 total participants, 68% (148) employed by U.S.-
95 based universities, conducting research in a number of contexts and with a variety of training
96 and professional experiences (Table 2). While we were able to determine that no single
97 individual completed the survey more than once, we were unable to calculate a response rate
98 due to 1) the unknown denominator information for listservs, and 2) an unknown quantity of
99 individuals who were likely in two or more of our target groups.

100 As seen in Table 2, the majority of respondents were from university or research settings
101 in the U.S. (69%) or Canada (13%). They were from a mix of clinical (28%) and community
102 settings (34%). The majority were from behavioral health (35%) or public health disciplines

103 (34%); 26% had received formal training in D&I and there was a wide distribution in years since
104 highest academic degree.

105

106 **Perceived Impact on Career and Practice/Policy.** When prompted to respond with their level
107 of agreement with the statement “It is an obligation of researchers to disseminate their research
108 to those who need to learn about it and make use of the findings”, 56% of current respondents
109 indicated that they strongly agree, compared to 51% in 2012. This difference was not
110 statistically significant. When asked “how often do you involve stakeholders”, Brownson’s survey
111 highlighted stakeholder engagement frequency at the project level, with 34% of participants
112 saying they always or usually involved stakeholders, 49% sometimes or rarely, and 17% never.
113 Individuals in our sample reported upon the frequency with which they typically engage non-
114 research stakeholders *within* projects, with 55% of respondents indicating that they did so four
115 or more times, 34% two to three times, 4% once, and 7% reported zero contacts with
116 stakeholders.

117 **Reported Dissemination Activities.** Respondents indicated routinely engaging in a variety of
118 dissemination-related activities, with academic journals and conferences (88% in our survey vs.
119 86% in 2012 respectively), and reports to funders (74%, not included in 2012 survey) being the
120 most frequent. Among these activities, publication in academic journals was identified as the
121 most impactful on respondents’ careers (94%), while face-to-face meetings with stakeholders
122 are seen as most impactful on practice or policy (40%: Table 3).

123

124 **Stakeholder engagement.** We asked several new questions related to stakeholder
125 engagement in the 2018 survey. Stakeholder involvement in the research process was
126 frequently reported, with clinical and community-based researchers engaging patients in similar
127 ways (see Table 3) including focus groups and advisory committees. In terms of practitioner
128 engagement, however, there were marked differences noted in that clinical researchers were

129 more likely to include practitioners on user panels (47.5% vs. 24.4%, $p < .01$), as formal team
130 members (62.7% vs. 45.5%, $p < .05$), and in interpreting data (59.3% vs. 38.2%, $p < .05$), but
131 less likely than community researchers to use them in focus groups (43.9% vs. 10.5%, $p < .01$).

132 With respect to training, respondents who had more D&I training (defined as either a
133 university course or fellowship) reported utilizing stakeholders differently than those with less
134 (including workshops, other shorter trainings, or no formal D&I training). Those with more
135 training were more likely to report using stakeholders in focus groups (including direct
136 practitioners, organizational decision-makers, and policymakers). Similarly, those with more
137 training were more likely to engage policymakers at all, being more likely to report engaging
138 policymakers in focus groups, on advisory committees, as formal team members, and to help
139 interpret data (Table 3).

140 Compared to their counterparts in the United States, university-based researchers in
141 Canada reported engaging patients/consumers and direct practitioners in generally similar
142 ways. However, Canadian researchers reported engaging organizational and policy-level
143 stakeholders much more extensively than scientists in the U.S., with rate differences of greater
144 than 25% observed between the two groups in terms of engagement of policymakers in focus
145 groups (11.5 to 46%, $p < .05$), on advisory committees (33.1 to 61%, $p < .05$), on user panels (3.4
146 to 29%, $p < .05$), and as formal team members (8.8 to 43%, $p < .05$) (Table 4).

147 In response to a question regarding stage(s) within the research process during which
148 stakeholders are involved, participants indicated that 28% involve them during the proposal
149 phase (vs. 27% in Brownson et al.), 28% (vs. 14% in 2011) in data gathering and analysis, and
150 47% (vs. 24%) in final reporting. Additional questions asked only in the present survey found
151 that: 18% involved stakeholders across all research phases, 18% did not typically involve non-
152 researchers, and 51% did so after publication for the purpose of supporting dissemination.

153

154 **Multivariable Analyses.** Finally, logistic regression analyses were conducted to evaluate the
155 relative contributions of different respondent characteristics to deeper or more comprehensive
156 engagement of stakeholders. These analyses indicated that research venue, nationality, amount
157 of D&I training, and seniority (assessed continuously as years since the respondent completed
158 their graduate training) did not significant relate to routinely engaging patients, direct
159 practitioners, or organizational decisionmakers in more than one way. None of these
160 characteristics, significantly associated with an increased likelihood of engaging more than two
161 stakeholder groups or routinely using more than the median number of total stakeholder
162 engagement strategies (8).

163

164 **Discussion**

165 With the increasing focus on disseminating research to practice (20) and a rapidly
166 changing landscape of dissemination strategies, it is helpful to periodically assess what
167 strategies D&I scientists are using to communicate evidence to practitioners and policy makers.
168 This report updated and expanded the survey conducted in 2012 by Brownson and colleagues,
169 but also sampled a broader range of D&I researchers (clinicians and Canadian D&I (KT)
170 scientists), in addition to the public health researchers included in the 2012 sample, and
171 provided greater depth on the evolving area of stakeholder engagement. D&I scientists
172 reported engaging in varied dissemination activities, some but not all of which have increased,
173 since the 2012 survey of public health researchers.

174 Comparisons were made on results on items that were identical or very similar to those
175 reported in Brownson et al.'s earlier survey of public health researchers. Specifically,
176 respondents in both samples reported using a variety of strategies to disseminate their work, but
177 most frequently used traditional methods of publications in scientific journals and presentations
178 at scientific meetings. This method is likely to influence the work of fellow researchers, who
179 consistently report learning about emerging science in these venues (21, 22), but often neglects

180 the seminars, professional association meetings, and electronic newsletters that local and state-
181 level practitioners are more apt to use in their efforts to stay up-to-date (23). The ongoing
182 predominance of these modes of dissemination today, despite recognition that these are not the
183 most effective way to reach and engage practitioners, is likely due to the reward system of
184 academic institutions. The general sentiment that dissemination of findings to non-research
185 partners is a core responsibility of those engaged in academic pursuits appears to be shared
186 between the two samples, despite several differences in the characteristics of the two samples.

187 Researchers in the 2018 sample still reported similar misalignment of incentives and
188 behaviors related to dissemination of findings, as documented in the 2012 survey. One
189 indication of the importance of reward structures can be seen in the details of the types and
190 level of stakeholder engagement reported in the two samples. While the general rate of
191 engaging stakeholders in research did not differ between the present survey and that reported
192 by Brownson, the specific methods and depth of research engagement of stakeholders differed
193 significantly between the two samples.

194 Even though both survey samples engaged stakeholders in similar ways, the stages at
195 which stakeholders informed the research process differed. This was most apparent in the
196 current sample, where 55% of respondents report that they typically engage stakeholders at
197 least four times over the course of a project, whereas only 34% in Brownson's survey reported
198 that they typically involved stakeholders at all. We hypothesize that this increase may be due in
199 part to the intervening impact of PCORI and other patient-centered funders requiring and
200 stakeholder engagement for funding, although specific qualitative work is needed to understand
201 these differences in greater detail.

202 **Differences across Respondent Types.** Researchers in clinical and community settings, as
203 well as those with more D&I training versus less, engage practitioners differently. Those with
204 more D&I training were more likely to use a variety of stakeholder groups in a number of
205 different ways. This was most evident as the stakeholder group engaged moved up the

206 organizational or contextual scale: those with more D&I training were more likely to engage
207 organizational and policy-level decision makers. In the latter case, there appears to be an
208 important distinction in that these researchers appeared more likely to engage higher-level
209 stakeholders at all, but were less likely to engage them in multiple ways. Future research and
210 training should emphasize longitudinal involvement of higher-level stakeholders, including in
211 varied roles.

212 Canadian researchers reported greater engagement, especially with policy makers.
213 Those trained longer ago did not illustrate an appreciably different pattern of stakeholder
214 engagement than those who completed their training more recently. Future analyses with higher
215 power to detect subgroup differences should focus on hypothesized differences between these
216 groups.

217 **Limitations and Future Directions.** Although informative, this study has several limitations.
218 These include the inability to determine a return rate given the unknown overlap among
219 recruitment sources and the unknown number of researchers receiving invitations from listserv
220 managers. Although we made concerted efforts to obtain representation from additional groups
221 beyond those sampled in the 2012 survey, the limited number of respondents (and consequent
222 insufficient statistical power to detect differences) in some categories such as Canadian
223 researchers limit conclusions. Despite efforts to include a reasonable sample size of VA
224 researchers, we were unable to obtain a sufficient number of VA researchers to conduct
225 subgroup analyses.

226 The 2012 and 2018 sampling frames were purposively different and only a minority of
227 the items directly replicated those on the 2012 survey. Other items were slight modifications
228 and included additional dissemination response options that did not exist or were not applicable
229 in 2012. As in any survey, our data are limited to respondents self-reported behavior and there
230 may have been social demand characteristics to report, for example, greater levels of
231 stakeholder engagement than are actually implemented. Despite these limitations, this study

232 provided an important update on dissemination practices to non-research audiences and
233 addressed a number of new questions such as the impact of D&I training on dissemination
234 practices and assessment of the level and “depth” of stakeholder engagement practices.

235 Future directions include replication with larger samples and qualitative and mixed
236 methods approaches to help understand some of the findings in greater depth. Gathering of
237 data from a broader audience of scientists might yield more divergent use of stakeholder
238 engagement and dissemination practices, theoretically yielding significant multivariable
239 predictors of what makes a “high-quality disseminator”. Another question is how these and
240 related findings (24) could buttress arguments for greater alignment between effective
241 dissemination activities and academic incentives. This mis-alignment has persisted since the
242 initial conference on dissemination and implementation (3), perpetuating a general
243 heterogeneity of any dissemination efforts other than through traditional academic media.
244 Finally, experimental comparisons of the actual effectiveness of different dissemination
245 strategies on different outcomes (e.g., implementation of guidelines vs. policy change vs. de-
246 implementation) are also indicated.

247 **Conclusions**

248 Despite limited incentives for dissemination to non-research audiences, D&I researchers
249 engage in a variety of strategies. There has been increased use of some, but not all strategies
250 since 2012, and greater in depth and multi-level stakeholder engagement. Greater
251 understanding of which dissemination strategies are most effective for what purposes and how
252 to increase and sustain effective strategies is important to facilitate more rapid and complete
253 translation of research to practice.

254

255 **List of Abbreviations**

256 D&I- Dissemination and Implementation

257 NIH – National Institutes of Health

258 PCORI – Patient-Centered Outcomes Research Institute
259 CIHR KT- Canadian Institutes of Health Research Knowledge Translation
260 IRI -Implementation Research Institute.
261 MT-DIRC – Mentored Training for Dissemination and Implementation Research in Cancer
262 CDC- Centers for Disease Control and Prevention
263 VA QUERI – Veterans Association Quality Enhancement Research Initiative
264 KT Canada – Knowledge Translation Canada
265 NCI D&I – National Cancer Institute Dissemination and Implementation
266 TIDRH – Training Institute for Dissemination and Implementation Research in Health
267 Regional PH Org- Regional public health organization

268

269 **Declarations**

270 Ethics Approval & Consent to Participate: All activities described herein received prior approval
271 from the Colorado Multiple Institutional Review Board (COMIRB).

272 Consent for Publication: The authors consent to the full and unabridged publication of all
273 manuscript and supplementary files.

274 Availability of Data and Materials: The survey used in this study is included in this published
275 article. The datasets used and/or analyzed during the current study are available on Zotero.

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287 analyses. All authors reviewed, edited, and approved the final manuscript.

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Sample Description	Time Frame Included	Approximate N invited
Corresponding authors in <i>Implementation Science</i>	January 2015-December 2017	225
PCORI grantees with D&I foci	2015- 2017	111
CIHR KT grantees	2015-2017	55
IRI fellows	2011-2017	63
MT-DIRC fellows	2014-2017	55
CDC Prevention Resource Center leaders	2017	47
VA QUERI listserv	April 2018	Unknown
KT Canada listserv	May 2018	Unknown
NCI D&I listserv	April 2018	Unknown
TIDRH listserv	April 2018	313

291 *Sample n's do not account for likely overlap between sources

292

Domain	Category	n(valid %)
Work venue	University or Research Org (U.S.)	148(68.8)
	University or Research Org (Canada)	28(13.0)
	University or Research Org (other)	14(6.5)
	Private nonprofit	6(2.8)
	NIH, CIHR, CDC, National or Regional PH Org	2(0.8)
	VA (from "other")	11 (4.0)
	Other	1 (0.5)
Primary Research Setting	Clinical (In- or Outpatient)	59(27.7)
	Community	73(34.3)
	Health Department	4(1.9)
	Health Delivery Systems	42 (19.7)
	Policy	4(1.9)
	Academic	21(9.9)
	Other	10(4.7)
Training	<4 years out	22(10.9)

	5-9 years out	64(31.7)
	10-14 years out	40(19.8)
	15-19 years out	33(16.3)
	20< years out	43(21.3)
	Behavioral Health	96(34.7)
	Medicine	33(11.9)
	Public Health	94(33.9)
	Health Services Research	69(24.9)
Support	CDC Prevention Research Centers Affiliate	14
	NIH or CIHR Funding	90
	PCORI Funding	25
	Other Funding	85
Experience	Have Worked in Setting Where Their Research Would be Implemented	144(67.9)

293

	<i>Typically used</i>	<i>Most impact on career trajectory</i>	<i>Most impact on practice/policy</i>
Academic journals	88	94	16
Reports to funders	74	0	6
Press releases	33	0	4
Newsletters	36	0	1
Policy briefs	21	0	8
Social media	42	0	3
Academic conferences	86	3	5
Seminars/workshops	51	1	9
Face to face meetings with stakeholders	55	0	40
Media interviews	22	0	1
Webinars/videos	30	0	0

294

Stakeholder type and method		Venue		D&I Training		Nationality		Yrs Since Training	
		<i>Clinical</i> <i>n = 59</i>	<i>Commun</i> <i>n = 123</i>	<i>More#</i> <i>n = 73</i>	<i>Less</i> <i>n = 49</i>	<i>U.S.</i> <i>n = 148</i>	<i>Can</i> <i>n = 28</i>	<i>0-10</i> <i>n = 97</i>	<i>≥10</i> <i>n = 104</i>
Patients/ Consumers	Focus Groups	61.0	56.1	60.3	55.1	61.5	50	48.5	62.5*
	Advisory Committees	59.3	61.0	61.6	53.1	57.4	75	55.7	58.7
	User Panels	33.9	27.6	28.8	20.4	30.4	32	23.7	34.6
	Team Members	32.2	34.1	34.2	16.3*	27.7	61	28.9	31.7
	Interpret Data	32.2	27.6	35.6	20.4	28.4	40	26.8	30.8

	Disseminate	47.5	38.2	41.1	36.7	36.5	57	37.1	41.3
	<i>Total ≥ 2</i>	68	61	64	51	62	75	57	64
Direct Practitioners	Focus Groups	10.5	43.9*	60.3	42.9*	50.7	57	45.4	48.1
	Advisory Committees	66.1	56.9	63.3	44.9*	59.5	68	56.7	57.7
	User Panels	47.5	24.4*	32.9	24.5	30.4	43	27.8	30.8
	Team Members	62.7	45.5*	50.7	51.0	27.7	61	47.4	50.0
	Interpret Data	59.3	38.2*	52.1	40.8	28.4	39	46.4	40.4
	Disseminate	62.7	48.0	53.4	59.2	36.5	57	52.6	51.9
	<i>Total ≥ 2</i>	80	64 *	71	61	70	75	65	68
Organizational Decision-Makers	Focus Groups	32.2	36.6	45.2	26.5*	35.1	50	37.1	27.9
	Advisory Committees	62.7	51.2	60.3	44.9	54.1	71	54.6	55.8
	User Panels	16.9	12.2	15.1	8.2	14.2	21	12.4	12.5
	Team Members	25.4	31.7	30.1	24.5	25.7	39	34.0	26.0
	Interpret Data	25.4	30.9	38.4	24.5	29.1	43	36.1	23.1*
	Disseminate	50.8	58.5	57.5	49.0	54.7	75	58.8	55.8
	<i>Total ≥ 2</i>	56	58	59	51	57	79*	62	55
Policymakers***	Focus Groups	15.3	16.3	17.8	4.1*	11.5	46	18.6	10.6
	Advisory Committees	35.6	39.8	42.5	20.4*	33.1	61	43.3	32.7
	User Panels	5.1	6.5	8.2	0.0	3.4	29	7.2	3.8
	Team Members	10.2	15.4	19.2	0.0*	8.8	43	9.3	5.8
	Interpret Data	18.6	13.8	21.9	2.0*	12.8	36	15.5	15.4
	Disseminate	37.3	47.2	47.9	32.7	39.2	71	17.5	8.7
	<i>Total ≥ 2</i>	29	34	40	14*	28	64*	38	29
n varied from 122-182 across items, *= $p < .05$ (Fishers' exact), #For the purpose of this analysis, the amount of training in Dissemination & Implementation Science was defined as More= university course or fellowship, while Less= workshop, single-day training, or lecture									

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