

TRAINING TEACHERS AND COACHES TO PREVENT SMOKING

1 **Impact and acceptability of the coach and teacher training within a school-based sport-**
2 **for-health smoking prevention intervention: SmokeFree Sports**

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Abstract

This study evaluated the impact and acceptability of a three hour bespoke training workshop for sports coaches and teachers to subsequently deliver a sport-for-health smoking prevention intervention in primary schools. Questionnaires were completed pre- and post-training by both teachers (n=24) and coaches (n=8), and post-intervention by teachers. Interviews were also conducted with coaches (n=7) and teachers (n=12). Both groups displayed a significant increase in intervention knowledge and delivery self-efficacy from pre- to post-training, which was maintained at post-intervention for teachers. Data suggests that a brief training workshop is acceptable to practitioners and fosters confidence to implement a sport-for-health smoking prevention program.

Key Words: Smoking, Training, Sport-for-health, Intervention, Self-efficacy, Acceptability

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53

54 **Introduction**

55 Despite health promotion efforts, over 207,000 young people in the United Kingdom
56 take up smoking each year (Hopkinson, Lester-George, Ormiston-Smith, Cox & Arnott,
57 2013). Early smoking onset increases the risk of developing smoking-related morbidities in
58 later life, including cancer, heart disease and stroke (Department of Health, 2011). The
59 importance of targeted preventative actions is therefore widely recognized, with school-based
60 interventions viewed as a critical component in preventing smoking uptake (The National
61 Institute for Health and Care Excellence (NICE), 2010).

62 Sport-for-health is a growing field in health promotion, whereby sport is recognized
63 as an educational platform to promote public health messages, as well as positively shaping
64 attitudes (Eime, Payne & Harvey, 2008; Priest, Armstrong, Doyle & Waters, 2008; Almond,
65 Almond & Saunders, 2013; Geidne, Quennerstedt & Eriksson, 2013). In North America,
66 community programs have used sport to deliver tobacco control actions (e.g. Tobacco Free
67 Sports [The US Centres for Disease Control and Prevention, 2007]; Play, Live, Be Tobacco
68 Free [www.playlivebetobaccofree.ca]). Within the school setting, in the UK, SmokeFree
69 Sports (SFS), a multi-component sport-for-health smoking prevention intervention, was
70 targeted at children aged nine to ten years (Trigwell et al., 2014; Trigwell et al., 2015).
71 Implementing sport-for-health programs in schools maximizes the reach of children across
72 social groups, utilizes existing infrastructure and is a natural setting for smoking interventions
73 as the focus on education falls within usual activities (Thomas, McLellan & Perera, 2013).

74 In SFS, sports coaches and primary school teachers (including class teachers, physical
75 education (PE) coordinators, teaching assistants and external sport coaches; termed teachers

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76 hereafter) were recruited to deliver a program of sports activities that aimed to strengthen
77 non-smoking intentions among never smoking children. Although it is recognized that
78 deliverers of smoking education programs should be sufficiently trained (NICE, 2010),
79 research indicates that coaches and teachers may not have the knowledge or skills necessary
80 to deliver sport-for-health programs (Bapat, Jorm & Lawrence, 2009; King, Delfabbro &
81 Griffiths, 2010; Alfrey, Webb & Cale, 2012). Further, a recent survey of initial teacher
82 training providers in England found that only 34% included a smoking education component
83 (Shepherd et al., 2013). Therefore, training was considered key in achieving the aims of SFS.

84 In the absence of a pre-existing training course that met the needs of SFS, a bespoke
85 three hour training workshop was developed to train sports coaches and teachers to
86 implement the intervention. The present study aims to evaluate the impact of a SFS workshop
87 on self-efficacy of teachers and sports coaches to deliver SFS. Self-efficacy, defined as "the
88 belief in one's capabilities to organize and execute the courses of action required to manage
89 prospective situations" (Bandura, 1997, p. 168), was considered an important construct for
90 evaluating the impact of the training as individuals are more likely to engage, persist and
91 contribute positively in activities through which they have a high perceived self-efficacy
92 (Marks & Allegrante, 2005; Hilland et al., 2014). A secondary aim of the study was to
93 examine the perceptions of teachers and coaches with regard to whether the training materials
94 and methods were appropriate and acceptable. To date, few studies have evaluated sport-for-
95 health interventions, whilst those that have lacked scientific rigor (Almond et al., 2013; Gray
96 et al., 2013). Findings will be used to improve prospective SFS programs, and may have
97 wider implications for the practice and procedures of training of sport-for-health practitioners
98 to deliver school-based substance use interventions.

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100

101 **Methods**

102 **Design and Procedures**

103 This study forms part of a wider program of research evaluating the process (Trigwell
104 et al., 2015) and impact of SFS (McGee et al., under review), which was implemented
105 between October 2012 and May 2013. The present study utilized a pre-post-test design and
106 mixed-methods to evaluate the bespoke training workshop and materials between October
107 2012 and June 2013. Self-efficacy toward delivery of SFS questionnaires were completed
108 pre- and immediately post-training by teachers and coaches (between October 2012 and
109 February 2013), and again at post-intervention by teachers (June 2013), whilst interviews
110 were conducted after intervention delivery (June 2013).

111

112 **Participants**

113 In September 2012, state primary schools in two local authorities in Merseyside,
114 North-West England (Liverpool, n=104; Knowsley, n=50) were invited to participate in SFS.
115 In total, 43 primary schools agreed to take part (27.9% response rate), comprising 32
116 intervention and 11 control schools. All Year 5 class teachers from intervention schools
117 (n=54) and all SFS sport coaches (n=11), were invited to attend a three hour SFS training
118 workshop. Teachers (n=33: 54.5% female; 62.5% aged 20-39 years) who attended the
119 training had between one and 34 years of teaching experience (mean=9.7 years, SD =7.5).
120 Coaches (n=11; 81.8% male; 72.7% aged 20-39 years) had between two and ten years of
121 coaching experience (mean=3.3 years, SD=1.1). All workshop attendees provided written
122 informed consent to participate in the study, which received ethical approval from the
123 University Ethics Committee [12/SPS/038].

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126 **SmokeFree Sports Intervention**

127 A detailed description of the SFS intervention has been published elsewhere
128 (Foweather et al., 2014; Trigwell et al., 2014). Briefly, SFS aimed to prevent smoking among
129 children aged nine to ten years (Year 5) through a school-based program of physical activity
130 and sport, including sessions delivered by coaches and teachers, and an assembly with a local
131 sports star. Knowledge gained from earlier SFS feasibility studies (Romeo-Velilla et al, 2014;
132 Hilland et al, 2014; Trigwell, McGee, & Foweather, 2012) was instrumental in the evolution
133 of SFS study design.

134

135 **SmokeFree Sports Training Workshop**

136 Following recommendations from NICE (2010), a bespoke SFS training workshop
137 was developed for coaches and teachers to equip them with knowledge surrounding smoking
138 issues, skills to deliver smoke free messages through physical activity (using an interactive,
139 participatory, game-based active learning approach) and confidence to raise and address key
140 issues about smoking with children. The training was comprised of a two-hour classroom-
141 based session (including presentations, group work and opportunities for questions and
142 answers) and a one-hour practical session, both delivered at a local leisure center during
143 school hours.

144 The classroom-based component was delivered by two members of the SFS team and
145 a member of the Liverpool Community Health National Health Service Trust. The training
146 provided details of the project and information about smoking, SFS key messages to promote
147 (i.e. around smoking and health, smoking and sport, the contents of a cigarette and their cost,
148 smoking and social influences, and the benefits of participating in sport) and practical
149 demonstrations on how to achieve this via sport. The practical component was delivered by
150 two multi-skill sport coaches and a dance instructor, and provided coaches and teachers with

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151 the opportunity to observe and practice activities and games. Attendees received SFS training
152 resources, consisting of smoke free pledges for children and a training manual, which
153 included ten 60 minute session plans for delivery.

154 Workshops were delivered between October 2012 and February 2013. All sports
155 coaches and at least one teacher from each participating school was required to attend.
156 Teachers completed the training by November 2012; sports coaches received the training
157 prior to delivering SFS in schools. On completion of the training, SFS coaches were required
158 to deliver five coaching sessions (multi-skill, dance or football) during school hours at each
159 intervention school between October 2012 and April 2013. Teachers were asked to feedback
160 information to colleagues and incentivized, with SFS branded equipment (50 sports cones
161 and 20 bibs), to independently deliver and evaluate a minimum of five session plans over the
162 intervention period.

163

164 **Measures**

165 **Self-efficacy questionnaire.** To assess the impact of the training on coaches' and
166 teachers' self-efficacy to deliver SFS, a questionnaire modified from Lane, Hall, and Lane's
167 (2002) measure of self-efficacy, was utilized. The questionnaire included 15 questions (five
168 knowledge and 10 delivery items) with scoring completed on a 'Likert' scale with 0
169 indicating '*no confidence at all*' and 4 '*very confident*' (see Table 1 for exemplar questions).
170 The question stem 'how confident are you in your ability to [insert competency] was utilized
171 (Lane et al., 2002) and is consistent with previous research (Bandura, 1997). Questions were
172 developed following consultation with expert practitioners, experienced in coaching,
173 behavior change and substance use. Questions surrounded the knowledge and skills required
174 to deliver smoke free messages and were aligned with the learning outcomes from the
175 training. Items were piloted within previous research (Hilland et al., 2014) and with three

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176 community sport coaches, with amendments made where necessary to aid content and face
177 validity. Questionnaires were completed by 24 teachers (12 males) at three time-points (pre-
178 and immediately post-training, and post eight-month intervention). Eight (6 males) of the 11
179 coaches who attended the training completed questionnaires in full at pre- and immediately
180 post-training. The questionnaire took participants approximately 10 minutes to complete.

181

182 **Table 1. Examples of domain-specific coach self-efficacy items**

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Domain	Item
Knowledge	How confident are you in your knowledge of the short and long term health risks of smoking?
Knowledge	How confident are you in your knowledge of the effects of nicotine on the body?
Delivery	How confident are you in your ability to communicate the short and long term health risks of smoking to children and young people?
Delivery	How confident are you in your ability to communicate the effects of nicotine on the body to children and young people?

184

185 **Semi-structured interviews.** Using purposive sampling techniques, 12 teachers (65%
186 female; 85.7% aged 20–39 years,) and seven coaches (86% male; 60% aged 20-39 years)
187 were interviewed to explore teachers' and coaches' perceptions of the impact of the training
188 workshop on their knowledge and delivery self-efficacy to implement SFS, as well as the
189 appropriateness and acceptability of training methods and materials. Interviews formed part
190 of a wider process and impact evaluation of SFS (McGee et al., under review; Trigwell et al.,
191 2015). All interviews were audio recorded and lasted between 30 and 60 minutes.

192

193 **Data Analysis**

194 For self-efficacy data, descriptive statistics were generated and data were checked for
195 normality. For analysis, self-efficacy questions were grouped into three summary variables, (i)

196 total self-efficacy score (15 items, $\alpha=0.9$); (ii) knowledge (5 items, $\alpha=0.7$); and (iii) delivery
197 (10 items, $\alpha=0.9$). As data were non-parametric, Friedman tests were conducted to determine
198 differences in teachers' self-efficacy across the three time points, with Wilcoxon Signed
199 Rank Tests applied for post-hoc comparisons (using Bonferroni adjustments) and to analyze
200 coaches' data.

201 All interview recordings were transcribed verbatim for analysis, imported into NVivo
202 version 10 and subjected to thematic analysis (Marshall & Rossman, 2006). This process
203 involved assigning broad thematic codes, pre-defined from topics covered in the interview
204 schedule, including the perceived impact of the training on deliverers, the acceptability of the
205 training and manual, and recommendations for improvement. Subsequently, broad codes
206 were collapsed into higher and lower order themes and descriptive and interpretive
207 summaries were written based on recursive engagement with the data. To aid the credibility
208 and trustworthiness of the results, analyses and interpretations of the data were discussed and
209 checked within the research team and amendments were made. The use of a mixed methods
210 approach allowed for the conformability of data through the process of triangulation (Shenton,
211 2004).

212

213 Results

214

215 Impact of the training workshop on self-efficacy toward delivering the SmokeFree

216 Sports intervention

217 **Quantitative findings.** Descriptive statistics for total, knowledge and delivery self-
218 efficacy are displayed in Table 2. Overall, for teachers, data revealed a significant effect for
219 time, across total ($X^2(2, N=24) = 36.549, P < 0.001$), knowledge ($X^2(2, N=24) = 38.188, P <$
220 0.001), and delivery ($X^2(2, N=24) = 36.462, P < 0.001$) self-efficacy. Between pre- and post-

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221 training, there was a significant increase in total ($Z=-4.202, P< 0.001$), knowledge ($Z=-4.132,$
 222 $P< 0.001$) and delivery ($Z=-4.205, P< 0.001$) self-efficacy. Similarly, between pre-training
 223 and post-intervention, significant increases in total ($Z=-4.289, P< 0.001$), knowledge ($Z=-$
 224 $4.298, P< 0.001$) and delivery ($Z=-4.296, P< 0.001$) self-efficacy were found. No differences
 225 were observed in self-efficacy scores between post-training and post-intervention (total, $Z=-$
 226 $.581, P=0.561$; knowledge, $Z= -1.691, P=0.091$; delivery, $Z= -.075, P= 0.94$). For coaches,
 227 data revealed a significant effect for time, with total ($Z=-2.032, P< 0.05$), knowledge ($Z=-$
 228 $2.032, P< 0.05$) and delivery ($Z=-2.041, P< 0.05$) self-efficacy increasing from pre- to post-
 229 training.

230 **Qualitative findings.** During the interviews, coaches and teachers articulated that the
 231 training had increased their knowledge and awareness surrounding smoking prevalence,
 232 reasons for smoking uptake among children and its impact on health.

233 *“It gave me more of an awareness of some of the issues surrounding smoking*
 234 *and some of the reasons young people were starting smoking.”* (Teacher 1)

235 *“When we done the training we were learning about the different effects that*
 236 *smoking has on your body and it was pretty educating for me because I hadn’t really*
 237 *done that much about smoking and what effects it has on your body.”* (Coach 4)

238

239 **Table 2. Descriptive statistics for total, knowledge and delivery self-efficacy at all-time**
 240 **points for teachers and coaches**

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	Teachers (N = 24); Md (IQR)			Coaches (N = 8); Md (IQR)	
	Pre-training	Post-training	Post- Intervention	Pre-training	Post-training
Total	38 (30, 43)	54 (49, 59)	55 (52, 58)	42 (37, 48)	59 (55, 60)
Knowledge	12 (10, 14)	19 (17, 20)	19 (17, 20)	14 (12, 16)	20 (18, 20)
Delivery	25 (20, 29)	37 (32, 40)	36 (34, 38)	29 (25, 32)	39 (38, 40)

242

243 In addition, teachers and coaches discussed how the training improved self-efficacy in
244 the delivery of SFS; this was particularly apparent with teachers as the training also provided
245 them with more ideas for delivering sessions:

246 *“It gave me more ideas because PE is not my strong point...so it was nice to*
247 *see the PE activities and how you could get that smoke-free message in.”* (Teacher 2)

248

249 **Acceptability of the training workshop and manual**

250 Teachers and coaches viewed the training and manual positively using terms such as
251 ‘enjoyment’ and ‘interesting’. Whilst teachers and coaches generally valued the importance
252 of the theoretical component of the training, the practical element was considered useful in
253 demonstrating how to deliver smoke free messages via sporting activities:

254 *“Seeing some of the games in action and how they panned out, how they*
255 *worked when we were practicing them as adults, then you get an idea of a few of the*
256 *potential pitfalls.”* (Teacher 11)

257 In relation to the manual, both coaches and teachers articulated that it aided their
258 delivery of sessions, praising the clarity of instructions and simplicity of session plans.

259 *“The manual, I thought was really useful, it breaks down [the activities] really*
260 *simply with clear explanations.”* (Teacher 15)

261 *“[I would use the manual to] educate myself to make sure what I was saying*
262 *to the kids was the right message and correct, making sure what I was saying some of*
263 *the facts and figures definitely.”* (Coach 3)

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268 **Recommendations to improve the training and manual**

269 In relation to the practical element of the training, some teachers and coaches felt
270 more time to practice delivery would have been beneficial, especially since teachers often felt
271 less confident and/or skilled to deliver physical activity sessions. For example:

272 *“I think we could have done a bit more dance - I don’t think that was covered*
273 *as much I wanted to but it’s not my strong point.”* (Teacher 4)

274 For the theory session, two teachers felt this section could have been condensed, with
275 one teacher stating:

276 *“That was probably an hour or an hour and a half, but you could have cut*
277 *that down to 10 minutes because the rest could have been put in a leaflet.”* (Teacher
278 13)

279 Coaches raised concerns surrounding smoking-related issues raised by children during
280 sessions and felt that the training and manual would benefit from including further
281 information or guidance on how to address such issues.

282 *“... some of the children were asking different questions and you are thinking*
283 *on the spot and you have to answer this question the best way you can, so if maybe*
284 *you get a page in it of awkward questions that children have asked before.”* (Coach 6)

285 It was also suggested by coaches and teachers that the usability of the SFS training
286 manual could also be improved through the inclusion of additional diagrams of the session
287 plans and/or a DVD of activities.

288 *“The drawings the diagrams are really good so more of them maybe for other*
289 *activities, just so when I’m flicking through it’s just easier to set up.”* (Teacher 10)

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Discussion

The present study used a mixed-methods approach to evaluate the impact and acceptability of a bespoke training workshop designed to upskill teachers and coaches to deliver SFS, a school-based sport-for-health smoking prevention intervention. Quantitative data showed that both teachers’ and coaches’ self-efficacy to deliver SFS increased from pre- to post-training across all domains (total, knowledge and delivery), and for teachers, these efficacy gains were maintained at post-intervention. Qualitative data corroborated these findings and, moreover, revealed the training and materials were acceptable. This study adds to the limited evidence base surrounding sport-for-health interventions and suggests a brief three hour training workshop is sufficient to train practitioners (i.e. teachers and sports coaches) to deliver sport-for-health interventions in primary schools.

Quantitative and qualitative data suggested that coaches’ and teachers’ self-efficacy (knowledge and delivery) toward implementing SFS increased following the training. These findings concur with previous research conducted in similar populations. For example, elementary school teachers felt better prepared to deliver tobacco use prevention curricula following in-service training (Kealey, Peterson, Gaul, & Dinh, 2000). Similarly, teachers who received training prior to delivering an active program promoting lifestyle education in school had an increased awareness of healthy eating and physical activity among their pupils (Sahota et al., 2001). With regards to coaches, two studies (Bapat et al., 2009; Pierce et al., 2010) reported positive training effects to enhance sports coaches’ knowledge, confidence and capacity to recognize and respond to mental illness, whilst another (Glang, Koester, Beaver, Clay & McLaughlin, 2010) offered brief online training to sports coaches and reported improved confidence in sports concussion management and prevention, relative to controls. In the present study, causality of self-efficacy increases cannot be directly attributed to the training due to the lack of a comparison group. However, participants completed the

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318 self-efficacy questionnaire before and immediately after the training, thus providing some
319 level of reassurance that efficacy gains reported represented true training effects. These
320 positive training effects could be explained in accordance with Bandura's (1997) sources of
321 self-efficacy. Participants suggested that the practical component of the training provided
322 opportunities for gaining mastery experiences of SFS activities. This could have been of
323 particular importance for the primary school teachers due to their lack of confidence and
324 perceived inability in terms of delivering PE (Morgan & Bourke, 2008). In addition, both
325 coaches and teachers noted the importance of observing others (modelling) delivering
326 intervention activities in the development of their own self efficacy. Nevertheless, the
327 mechanisms for learning effects warrant further study.

328 The training and manual were considered acceptable to both teachers and coaches,
329 whilst recommendations for future delivery were given. The pedagogical approaches were
330 well received by participants, and utilized the types of delivery formats (e.g. lectures, group
331 work, manuals, practical demonstrations) commonly incorporated within health related
332 teacher training (Shepherd et al., 2013). Notably, the use of practical sessions prepared
333 teachers and coaches effectively for the delivery of SFS and concurs with previous work
334 (Evans, & Evans, 2007; Fenton, 2008; Nelson, Cushion & Potrac, 2013; Rossato &
335 Brackenride, 2009; Taylor, Prain & Rosengren, 2008).

336 Recommendations to improve the training included having more time to rehearse
337 delivery, to condense the classroom-based theory session, and to discuss potential issues that
338 children may raise about smoking during sessions. A minority of teachers suggested that the
339 theoretical session was unnecessary. This finding may reflect that teachers had more
340 knowledge of health topics than sports coaches, and therefore have different learning
341 requirements. However, it should be noted that previous research suggests that trained
342 teachers are more likely to continue to implement smoking prevention curriculum than

343 untrained teachers who only received program materials (McCormick, Steckler & McLeroy,
344 1995). Future programs may wish to conduct a needs assessment to inform training design.
345 With regards to the manual, suggestions were made to include additional visual learning
346 resources, indicating that program support materials should be regularly reviewed and
347 updated.

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349 **Strengths and Limitations**

350 A major strength of this study is the use of mixed methods, as the qualitative data
351 illuminated and added depth to the quantitative findings. Further, the study was the first
352 sport-for-health intervention to explore the efficacy of training both coaches and teachers as
353 intervention deliverers. There are, however, a number of study limitations. Firstly, a lack of
354 comparison group means that causality attributed to the training workshop cannot be
355 confirmed. Secondly, the sample size of coaches was small and represented a limited range of
356 sports, whilst both the teachers and coaches were recruited from a single deprived local
357 authority in the North-West of England, limiting the generalizability of findings. Thirdly,
358 whilst the self-efficacy questionnaire items were created in accordance with guidelines
359 (Bandura, 2006) and in a manner consistent with the development of similar scales (Norcross,
360 Johnson, Bovbjerg, Koester & Hoffman, 2015), reliability checks were limited to internal
361 consistency. Test-retest reliability checks were not considered appropriate as self-efficacy
362 beliefs may not show a high degree of temporal stability (Bandura, 1997). Finally, although
363 coaches and teachers were encouraged to respond honestly, the possibility of socially
364 desirable and therefore biased responses cannot be ruled out.

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Conclusion

Sport-for-health programs should provide practitioners with adequate training which includes the rationale and benefits of the program components and how to deliver the program optimally, alongside the provision of appropriate resources and support materials (Finch & Donaldson, 2009). This study has shown the value, acceptability and utility of a brief training workshop for increasing teachers’ and coaches’ self-efficacy towards delivery of SFS, a novel sport-for-health smoking prevention intervention. However, research is needed to determine whether teacher and coach efficacy beliefs translate into effective implementation of SFS.

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The authors have no conflict of interests to declare.

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