Evaluation of implementation and effects of a health-promoting sports club intervention using a mixed-method design: PROSCeSS protocol

Benjamin Tezier, Francis Guillemin, Anne Vuillemin, Stacey Johnson, Fabienne Lemonnier, Florence Rostan, Aurélie Van Hoye

ABSTRACT
Public authorities and academics have advocated for applying health promotion (HP) interventions in sports clubs poorly understand and apply this approach. Moreover, methods used to evaluate these interventions do not inform their implementation process, limiting the generation effectiveness proofs. This study aims at evaluating the implementation process and effectiveness of an HP intervention in sports clubs (PROmotion de la Santé dans les Clubs de Sport; PROSCeSS), based on the health-promoting sports club (HPSC) model. A type 3 hybrid design, using a multiphase mixed-method: QUAN→QUAL→QUAN+QUAL (quaq)→QUAL (qual-qual), will be used. Phase A will be a pre–post–quantitative study with one HP officer, five managers and five coaches from 30 sports clubs exploring the effects of the PROSCeSS intervention on HP perceptions and health literacy. Phase B will be focus groups with participants from HP initiatives that the 30 sports clubs will have previously put in place to detect changes in health. Phase C will explain the results of phases A and B by choice of strategies and adherence to standardised steps, measured through semistructured interviews and implementation data collection. Phase D will cross-reference the semistructured interviews, the sports club characteristics questionnaire and the implementation data collection to study the relationships between the context and the implementation process. This protocol will identify ‘what works’, ‘for whom’, in ‘what context’ in terms of HPSC and clarify which intervention components are more effective at improving HP. This evaluation design will help to develop appropriate approaches to evaluate HP interventions.

WHAT IS ALREADY KNOWN ON THIS TOPIC
Sports clubs are a setting that can contribute to promoting health. Several health promotion (HP) interventions have been identified. Still, they often target specific health behaviours without giving clubs the choice of HP initiatives and without acting on the different levels and health determinants. Developing interventions based on a theoretical model could facilitate a social–ecological approach to health and evaluate the implementation processes. The effectiveness could facilitate the development of adapted interventions.

WHAT THIS STUDY ADDS
This study presents an HP intervention conducted in sports clubs based on a theoretical and an intervention framework. This protocol evaluates an HP intervention’s effectiveness and conditions using a validated tool, mixed methods and hybrid design.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY
This study represents a step in developing more generalisable HP interventions and implementation strategies for sports clubs.

INTRODUCTION
To improve health, public authorities and academics have been advocating for many years for a setting-based approach, considering that settings are ‘social places or contexts in which people engage in daily activities where environmental, organisational and personal factors interact to affect health and well-being’.1 This approach is based on a socioecological approach,2 which considers that it does not depend only on individual behaviours but factors in part influence it at different levels (ie, individual, interpersonal, institutional, community and public policy), which interact with each other and affect health. Many settings, like schools or cities,3 have successfully implemented setting-based health promotion (HP) interventions. Recently, sports clubs have been recognised as non-traditional settings that can contribute to promoting health.4 Beyond attracting a large population (12% of Europeans from diverse socioeconomic backgrounds),5 their voluntary and non-lucrative nature plays an important role in mediating information and values6 and confers a strong educational potential.4 In addition, sports
participation and the context in which it takes place can be associated with numerous physical, mental and social health benefits.\textsuperscript{4, 7, 8} Some sports clubs are seizing this potential and developing HP-related activities, such as sport for all\textsuperscript{9} or smoke-free environments.\textsuperscript{10} Different studies have also highlighted that not all sports contexts are health friendly, such as sports cafeterias that offer ‘unhealthy’ products,\textsuperscript{11} sponsors related to alcohol or sugary drinks.\textsuperscript{12} Thus, the potential of sports clubs to promote health is not inherent and depends on their ability to develop and act on health determinants within the sports club.

Since the recognition of the potential of the sports club to promote health, a growing number of HP interventions have been identified.\textsuperscript{13, 14} Although they have generated health benefits, a literature review revealed that most interventions poorly apply the setting-based approach and are not based on a theoretical model, limiting their effects, scope, transferability and sustainability.\textsuperscript{13} These interventions mainly targeted sports participants rather than the whole club (club, managers, coaches). They were focused on specific health behaviours (eg, nutrition, alcohol, smoking, social inclusion) rather than on the different health determinants in this setting\textsuperscript{15}: organisational (policies, decision-making process, orientations), environmental (material and infrastructure), social (values, norms and climate) and economic (human, material and financial resources). Additionally, evaluation methods for these interventions remain limited because no validated HP measurement tool has been used. Very few longitudinal designs have been realised,\textsuperscript{15} limiting the understanding of their effectiveness and transferability. Similar results were found by another literature review,\textsuperscript{14} identifying only three controlled studies worldwide evaluating HP interventions in sports clubs, which targeted single health behaviour and were not grounded in a theoretical model.

Theoretical conceptualisation is key to transforming knowledge into practice or maximising the effects and duration of interventions.\textsuperscript{16} Due to the complexity of the socioecological approach and its application to specific settings, this need for theoretical conceptualisation is particularly important to implement and make interventions effective and for their evaluation.\textsuperscript{17} The health-promoting sports club (HPSC) model and intervention framework,\textsuperscript{1, 15} based on the setting-based approach,\textsuperscript{1} have recently been developed to meet this need. The model and framework are based on the HPSC concept,\textsuperscript{4} on evidence-driven guidelines\textsuperscript{13} and incorporating the needs, knowledge and experiences of sports club stakeholders.\textsuperscript{18} The framework provides 69 intervention components and 13 strategies (table 1), acting on the health determinants and at different levels of the sports club: individual (sport participants’ personal characteristics and behaviours), microlevel (coaches’ activities to guide, alter or support sports participants’ actions), meso level (activities of sports club managers), macro level (overall HP policies and orientation of sports club activities), sports federations and second-line services (eg, government, public health departments).

The PROSCeSS intervention

The PROmotion de la Santé dans les ClubS de Sport in French (PROSCeSS) intervention is theoretically grounded in the HPSC model\textsuperscript{15} and was developed through coconstruction work.\textsuperscript{19} The objective of the intervention is to enable the sports club to adopt an HP approach using multideterminant and multilevel strategies, which have proven effective.\textsuperscript{20} The intervention is implemented through an eight-step process, lasting 15 months (see figure 1 and table 2 for details), targeting enhanced HP knowledge, developing individual and collective empowerment and generating organisational and environmental changes. The intervention steps are standardised in terms of dose and content. Still, sports clubs have the flexibility to choose their HP objectives and two HP initiatives to develop by applying the 13 strategies and 69 intervention components from the HPSC model, which best meet their specific goals and needs. A dedicated project team member will coach each club to carry out the intervention steps.

Objective

This study aims to investigate the implementation process and evaluate preliminary evidence of the effectiveness of the PROSCeSS intervention in improving the HP and the health of sports club actors.

Hypothesis and research questions

The hypothesis and research questions are presented in phase form to differentiate the methods and analyses used but do not represent the chronology of the study.

Phase A: the PROSCeSS intervention will increase HP perceptions and health literacy of the HP officer, managers and coaches in 30 different sports clubs.

The use of qualitative and mixed-methods will question the following issues:

Phase B: How will sports participants adopt the PROSCeSS intervention, and how will it impact their physical, mental and social health?

Phase C: How will adherence (dose and intensity) to implementation and the number and type of strategies used to influence changes in the HP perceptions and health literacy of HP officers, managers and coaches as well as in participant health?

Phase D: How do the different contexts of 30 sports clubs influence the implementation of the intervention, including the choice of strategies, the initiatives that were undertaken and the transferability of the PROSCeSS intervention?

METHODS AND ANALYSIS

Design

The proposed intervention is a complex intervention,\textsuperscript{21} with expected effects at several levels (individual, micro, meso and macro) and multiple target populations
### Table 1 Strategies and intervention components of the HPSC intervention framework (Van Hoye et al., 2021)

<table>
<thead>
<tr>
<th>Strategies</th>
<th>Intervention components</th>
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</thead>
</table>
| **COMMUNICATION:** Develop and implement communication to raise awareness of the actions taken to promote health within the sports club | COM1: Develop a communication plan  
COM2: Communicate with one message, a slogan (clear, explicit and visible)  
COM3: Ensure internal club communication  
COM4: Ensure the club communicates with the external environment  
COM5: Ensure the club communicates with all partners  
COM6: Communicate the benefits of health promotion activities |
| **DYNAMIC:** Create strategies to improve all stakeholders’ sense of belonging to the club and consider the individual and their environment (socio-ecological approach) to define the most relevant health promotion goals | DYN1: Take the feeling of belonging to the club into account when defining the goals  
DYN2: Consider interactions between the individual and their environment, while defining health promotion goals |
| **EDUCATION:** Support the sports club, management and coaches by varying the type of education they receive and take into account differences in the sports’ participants they coach | EDU1: Support the managers and coaches to actively engage in gaining knowledge and skills to promote health  
EDU2: Tailor the support to the managers and coaches individually in relation to the sports’ participants they coach (mentoring, courses, online tools)  
EDU3: Encourage the managers and coaches to support each other to promote health  
EDU4: Propose a variety of ways for the sports clubs to raise awareness about health promotion  
EDU5: Create tools and training courses to support health promotion in sports clubs |
| **EXPERIENCE:** Identify past club experiences, organisational readiness and the reasons and quality of the club’s commitment to promote health | EXP1: Identify previous club experiences to promote health  
EXP2: Identify the organisational readiness to promote health  
EXP3: Identify reasons for commitment to promote health  
EXP4: Identify the degree of commitment to promote health  
EXP5: Rely on existing, evidence-based health promotion tools  
EXP6: Rely on a diagnosis to assess needs and expectations to implement health promotion actions  
EXP7: Rely on other clubs’ experiences when developing health promotion actions |
| **GOALS:** Write down the sports club’s health promotion goals, using positive messages, adapted to sports language, culture and the placement of health promotion within the club, considering the social inequalities of health | GLS1: Define the goals of health promotion  
GLS2: Health promotion goals are formally written and documented  
GLS3: Write goals in a positive sporting language based on the club’s culture  
GLS4: Consider inclusivity (eg, how people experience health differently) when defining the goals |
| **FEASIBILITY:** Regularly review the capacity of the sports club to achieve its health promotion goals | FEAS1: Regularly review the financial resources being used  
FEAS2: Regularly review the human resources being used  
FEAS3: Regularly review the club’s capacity to undertake the actions required to achieve the goals  
FEAS4: Regularly review the time dedicated to achieving the goals |
| **MOBILISATION:** Mobilise people to manage the development of health promotion | MOB1: Mobilise sports champions to support the development of health promotion within your club  
MOB2: Mobilise experts in health promotion  
MOB3: Identify and mobilise one or several internal health promotion representatives  
MOB4: Mobilise parents (and other family members) to support health promotion actions  
MOB5: Mobilise local decision-makers and elected officials to promote health within the sports clubs  
MOB6: Advocate with sports federations to support the clubs on health promotion actions |
| **MONITORING:** Monitor health promotion activities in daily practice using a ‘small steps’ philosophy and review any changes | MON1: Review small improvements towards achieving health promotion goals  
MON2: Review all the health promotion activities undertaken in the club  
MON3: Review the short-term effects of the actions (changes within one sports season)  
MON4: Review the long-term effects of the actions (changes beyond one sports season)  
MON5: Review the health promotion policies of the sports clubs |
| **MOTIVATION:** Understand what motivates coaches to implement health promotion and empower them in this undertaking | MOT1: Foster positive interpersonal relationships  
MOT2: Take coaches’ skills to manage situations into account  
MOT3: Take coaches’ motivation for coaching and their future expectations into account  
MOT4: Strengthen coaches’ autonomy to promote health  
MOT5: Strengthen coaches’ sense of ownership of the club |
| **PARTICIPATIVE APPROACH:** Value a ‘participative approach’ to promote health throughout the club and beyond | PAP1: Identify and call attention to health promotion actions of individuals  
PAP2: Identify and call attention to coaches’ health promotion actions  
PAP3: Identify and call attention to management health promotion actions  
PAP4: Identify and call attention to every health promotion action  
PAP5: Include the managers, coaches and sports participants in the decision-making process  
PAP6: Involve parents (and other family members and friends) in health promotion efforts |
| **PARTNERS:** Partner with other organisations to create a common culture and collaborative process to promote health | PART1: Identify partners for health promotion (clubs, agencies, regional authorities, health professionals)  
PART2: Define how to collaborate with existing and future partners (define roles, share experiences, contract terms, evaluation of results, equal partner power)  
PART3: Create a common culture with existing and future partners (trust, recognition, shared time) |
(managers, coaches and sports participants). Therefore, a flexible evaluation model, with a better understanding of the contexts in which effects unfold, is needed. To this end, a hybrid effectiveness-implementation design allows for an evaluation that creates reliable and transferable data by considering the complexity of HP interventions and their contexts. Among hybrid designs with a focus on evaluating the effectiveness and implementation, the hybrid type 3 design is recommended when effectiveness outcomes are highly dependent on the quality of implementation and when interventions are ‘tailor-made’ with choices of multiple implementation strategies. It seeks to test the acceptability, adoption, fidelity and sustainability of the intervention or strategies to determine implementation outcomes (eg, which strategies are used in which settings, with what intensities, by whom, and in what ways) and then measures the effects of the intervention on the target population by incorporating the level of intervention strategy adoption.

**Table 1 Continued**

<table>
<thead>
<tr>
<th>Strategies</th>
<th>Intervention components</th>
</tr>
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</table>
| **PLANNING:** Create an implementation plan to achieve the written health promotion goals | **PLAN1:** Include the core goals in the plan  
**PLAN2:** Include the target population in the implementation plan  
**PLAN3:** Include the funding sources in the implementation plan  
**PLAN4:** Include the responsible persons in the implementation plan  
**PLAN5:** Include key steps in the implementation plan  
**PLAN6:** Encourage sustainable health promotion actions  
**PLAN7:** Base future plans and policies on current health promotion actions  
**PLAN8:** Plan future actions based on the evaluation of current actions |
| **RESOURCES:** Identify, develop or review financial, human, material and capacity building resources available to invest in health promotion | **RES1:** Review available financial resources (subsidies, sponsors) to invest in health promotion  
**RES2:** Review available human resources (dedicated volunteer time, staff turnover) to invest in health promotion  
**RES3:** Review current skills and knowledge available to promote health  
**RES4:** Identify and mobilise tools for health promotion development within sports clubs  
**RES5:** Identify the funding that can be used for health promotion actions  
**RES6:** Establish a national resource site for health promotion within sports clubs  
**RES7:** Establish a national spokesperson for health promotion within sports clubs  
**RES8:** Create and host a regional and local network of health promotion mentors within sports clubs (share practices) |

HPSC, health-promoting sports club.

**Figure 1** PROSCeSS intervention and data collection. HPSC, health-promoting sports club; PROSCeSS, PROmotion de la Santé dans les ClubS de Spor.
### Table 2 Course and content of the PROSCeSS intervention

<table>
<thead>
<tr>
<th>Steps</th>
<th>Activity</th>
<th>Time period</th>
<th>Duration of the meeting</th>
<th>Purpose of the activity</th>
<th>People present (except the dedicated member of the project team)</th>
<th>Tools used</th>
</tr>
</thead>
</table>
| 1. Engagement meeting | Meeting for:  
► The presentation of the main lines of HP in the sports club  
► The presentation of the intervention (objectives and process)  
► The recruitment of a health promotion officer and signature of the commitment charter | April–May | 30 min–1 hour | The HP officer is identified and has signed the charter of commitment, he/she has understood the main purpose of what HP is in the sports club and the steps of the intervention that will allow him/her to develop initiatives in the club | A person from the sport club who has HP knowledge and developed activities | Presentation material (computer)  
Infographic of the intervention's progress  
Commitment charter |
| 2. Training | Training around HP in the sports club, testimonies of health-promoting sports clubs, detailed presentation of the steps and strategies of the intervention and time for questions and answers | Last week of May | 4 hours | The HP officers in each club understand what HP is in the sports club, what forms it can take, how to implement it, and what are the steps and content of the intervention that will enable their implementation | The HP officer from each sports club, sports clubs implementing HP initiatives and members of the project team (the PROSCeSS team) | Presentation material (computer)  
Various elements around the organisation of a face-to-face training (room, buffet, etc.), distance or even hybrid training |
| 3. Evaluation of needs and initiatives planning | Meeting(s) to:  
► Carry out a diagnosis of the context, needs, resources, experiences, skills and objectives of the sports club to promote health  
► Set 2 HP initiatives  
► Select from 69 intervention components and 13 strategies to meet HP initiatives and specific characteristics of the sports club  
► Plan initiatives over the sports season | It is possible that this step takes place over two meetings: May–July | 2–4 hours | Plan 2 HP initiatives (eg, adapted sport sessions, healthy cafeterias, homework help in connection with psychosocial skills deployed in the practice of sport, waste collection and awareness of sustainable development, injury prevention) and identify relevant intervention components and strategies (based on the diagnosis) to meet the club’s character and implement HP initiatives | The HP officer | Diagnostic tool  
Tool for setting objectives and strategies |
| 4. Project presentation meeting with club managers and coaches | Presentation meeting and discussion of the two initiatives and objectives that have been developed and strategies, which have been identified with the coaches and managers of the sports club | August–September | 1 hour | Initiate a common reflection with managers and coaches of the sports club and have their support for the intervention | The HP officer, managers and coaches of the sports club | Presentation material (computer)  
Document summarising summarising the planned HP objectives and initiatives as well as the identified strategies and intervention components |
| 5. Interclub event | Convivial event at the beginning of each sports club HP project in the form of a conference and a moment of free exchanges, which brings together all the HP officers from the different sports clubs, the project team and potential partners | October | 3 hours | Discuss the initiatives and objectives of HP of each sports club, the strategies that seem to be the most relevant, generate ideas, create collaborations and create a feeling of belonging to a network (PROSCeSS network). | The HP officer and the coaches and managers of the club who have decided to support him, members of the project team and potential partners (city stakeholders, HP professionals, etc.) | Presentation material (computer)  
Various elements around the organisation of an event (rooms, meals, etc.) |

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<th>Tools used</th>
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<tr>
<td>6. Implementation and follow-up of the initiatives</td>
<td>The HP officer and the managers and coaches who support him while</td>
<td>September to June</td>
<td>Implement the initiatives and strategies of HP and ensure their smooth running</td>
<td>The HP officer and the managers and coaches of the club support him</td>
<td>► Tools to keep contact between the HP officer and the dedicated member of the project team</td>
<td>► Various tools that have been developed</td>
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<td>implementing HP initiatives and objectives and ensure follow-up</td>
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<td>7. Club review meeting</td>
<td>Presentation of HP initiatives to managers, coaches and members of the</td>
<td>May</td>
<td>1 hour</td>
<td>Present the results of the HP initiatives to strengthen their place within the club,</td>
<td>The HP officer, managers and coaches of the sports club</td>
<td>► Presentation material (computer)</td>
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<td>sports club</td>
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<td></td>
<td>encourage reflection around these initiatives to strengthen them or develop new</td>
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<td>► Document that summarise the achievement of objectives and the results of HP initiatives</td>
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<td></td>
<td></td>
<td>initiatives</td>
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<tr>
<td>8. Interclub event at the end of season</td>
<td>Convivial event for the end of each sports club HP project in the form of</td>
<td>June</td>
<td>3 hours</td>
<td>Allow each club to present the results of their HP initiatives, to talk about the</td>
<td>The HP officer and the managers and coaches of the club who support him, members of</td>
<td>► Presentation material (computer)</td>
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<td></td>
<td>a conference and a moment of free exchanges, which brings together all</td>
<td></td>
<td></td>
<td>barriers and facilitators encountered, the orientations to develop or strengthen</td>
<td>the project team, potential partners (members of the town hall, health promotion</td>
<td>► Various elements around the organisation of an event (rooms, meals, etc.)</td>
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<td></td>
<td>the HP officers of the sports clubs, the project team and potential</td>
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<td>partnerships and to develop the network (PROSCeSS network)</td>
<td>professionals, etc.) and future sports clubs who may wish to be included</td>
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<tr>
<td></td>
<td>partners</td>
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HPSC, health-promoting sports club; PROSCeSS, PROMotion de la Santé dans les ClubS de Spor.
This protocol presents how a hybrid type 3 design can be used to investigate the implementation process and evaluate the effectiveness of the PROSCeSS intervention and describes its mixed-method multiphase research: QUAN→QUAL→QUAN+QUAL(qual)→QUAL(qua +qual) (see figure 1 and table 3 for detail).

Sample and recruitment

The study is based on the concept of a cluster, represented by sports clubs allowing observation of whether the intervention has a greater effect on one subgroup over another. Inclusion criteria for sports clubs are to be affiliated with a sports federation belonging to the French National Olympic Committee. The type of sport (individual/collective and gender participation rates) will be the primary selection criterion. To ensure diversity, secondary selection criteria include location (rural/urban), club size (less than 100, between 100 and 1000, more than 1000 members) and resources (eg, number of employees, number of volunteers, ownership of infrastructure or not and availability of an HP officer). The lack of previous longitudinal studies measuring HP perceptions hampers the ability to calculate the sample size. Moreover, the voluntary nature of the PROSCeSS intervention reinforces the call to select sports clubs based on their commitment to organisational change through HP.

To consider different French contexts, two cities were identified to carry out this intervention: Nancy and Nice. Fifteen sports clubs per city will be recruited to analyse the diversity of projects and contexts related to clubs in different regions of France. A dropout rate of 20% is expected, resulting in the probable loss of 6 sports clubs during the intervention. An email describing the intervention and objectives will be sent to all eligible sports clubs in these cities. The sports clubs that respond positively and have identified an HP officer will be recruited. Sports clubs that have not identified an HP officer, who have not signed the commitment charter and who will complete one of the stages late (see figure 1), will be excluded from the study.

Ethical approval

The intervention, design, methods and consent procedure were approved by the Université de Lorraine ethics committee and follow the principles of General Data Protection Regulation (number 2021/66) and the French ethical regulations. The use of data is in accordance with the European and national laws and regulations of Regulation (EU) 2016/679 regarding personal data, free movement of such data and the European Code of Conduct for Research Integrity as well as national ethics regulations. Before taking part in the study, participants will be provided information about the study, objectives, implications for taking part and data management. Signed informed consent will be obtained by the research team from each participant and their parent/guardian if they are under 18 years old before completing the questionnaires. Participants will have the right to withdraw from the study at any time without consequences and will be informed of how they can access the data (request to the research team). In addition, anonymised key findings will be presented to sports clubs to show potential changes.

Phase A: the PROSCeSS intervention will increase HP perceptions and health literacy of the HP officer, managers and coaches in each sports club

This phase is designed as a pre-post-quantitative study.

Sample

Each club will be asked to identify an HP officer at the beginning of the intervention, which will be included in the data collection. This person will then responsible for identifying at least five managers and five coaches during the project presentation meeting in the club (step 4) to be included in the study. A total of 30 HP officers, 150 managers and 150 coaches will be recruited.

Measurement

A four-part prequestionnaire will be collected from the HP officer of each club: 1—sports club characteristics, 2—characteristics of respondent’s role in the club, 3—HP perceptions and 4—health literacy. A three-part prequestionnaire will be collected from coaches and managers of each club: (2—information on the role in the club, 3—HP perception and 4—health literacy). The postquestionnaires for HP officers, managers and coaches are only composed of items regarding HP perceptions and health literacy.

1. Characteristics of the sports clubs include the number of licensees, employees, training slots or financial resources (see online supplemental annexe 1).
2. Characteristic of the respondent’s role includes the number of hours in the club, being a volunteer or paid employee (see online supplemental annexe 2).
3. The validated French version of the e-PROSCeSS questionnaire25 will be used to measure managers’ and coaches’ HP perceptions. The questionnaire is composed of three different scales: the macrolevel includes items to measure the global HP orientation of the sports club, the mesolevel measures the HP guidance of managers towards coaches and the microlevel measures HP actions from coaches to the participants of their sport. Each scale categorises items into one of four health determinants: economic (eg, My sports club allocates resources to HP actions (eg, communications, administrative support, staff time)); environmental (eg, My sports club has safe infrastructures (eg, locker rooms, practice fields, other spaces)); organisational (eg, My sports club has defined the roles, responsibilities and expectations while working with partners to promote health); social (eg, My sports club encourages the ‘everyone plays’ ideology). Each item is rated on a 6-point Likert scale: Strongly disagree; Disagree; Slightly disagree; Slightly agree; Agree; Strongly agree and the possibility to answer: I do not know.

**Table 3** Description of the mixed method pre- post- hybrid type 3 design

<table>
<thead>
<tr>
<th>Phases</th>
<th>Hypothesis and research questions</th>
<th>Design</th>
<th>Data collection</th>
<th>Data analysis</th>
<th>Expected results</th>
<th>Data integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase A</td>
<td>The PROScEeSS intervention will increase HP perceptions and health literacy of the HP officer, 5 managers and five coaches in each sport club</td>
<td>Pre-post quantitative study</td>
<td>Questionnaires of HP perceptions, health literacy and information about the role in the sport club (online supplemental annex 2)</td>
<td>Descriptive, multivariate, multilevel analysis using R software</td>
<td>▶ Effects of intervention implementation on HP perceptions and health literacy among sports club HP officers, managers and coaches</td>
<td>▶ Information of the health determinants and club levels which are impacted the most when implementing HP</td>
</tr>
<tr>
<td>Phase B</td>
<td>How will the PROScEeSS intervention be adopted by sport participants and will it impact their physical, mental and social health?</td>
<td>Qualitative study (post)</td>
<td>Focus group (one per initiative)</td>
<td>Content analysis using Nvivo software</td>
<td>Effects of the intervention on the satisfaction and health of participants</td>
<td></td>
</tr>
<tr>
<td>Phase C</td>
<td>How will the adherence of implementation and the number and type of strategies used to influence changes in HP perceptions and health literacy of HP officers, managers, coaches and participant?</td>
<td>QUAN+QUAL (qual): The quantitative and qualitative results will be explained by the qualitative results</td>
<td>Questionnaires of HP perceptions, health literacy and information about the role in the sports club (online supplemental annex 2)</td>
<td>Content analysis using Nvivo software</td>
<td>Information on the relationship between strategies used and the effects on participants health, literacy and HP perceptions of managers and coaches</td>
<td>Adherence to the implementation and number and type of strategies mobilised (qualitative) will be used to explain the evolution of scores of HP perceptions and health literacy of managers and coaches (quantitative) and changes in the health of sports participants (qualitative)</td>
</tr>
<tr>
<td>Phase D</td>
<td>How do the different contexts and characteristics of the 30 sports clubs influence the implementation of the intervention, including the choice of strategies, the initiatives undertaken and the transferability of the PROScEeSS intervention?</td>
<td>QUAL (quan+qual): The qualitative results will be explained by the qualitative and quantitative results</td>
<td>Sports club characteristics questionnaire (online supplemental annex 1)</td>
<td>Content analysis using Nvivo software</td>
<td>Information on the relationship between context and the intervention implementation</td>
<td>The contexts of sports clubs (quantitative and qualitative) will be used to explain the implementation process (qualitative)</td>
</tr>
</tbody>
</table>

HPSC, health-promoting sports club; PROScEeSS, PROmotion de la Santé dans les ClubS de Spor.
4. Given the diversity of HP initiatives that will be implemented, no opportunities for measuring specific health behaviours have been identified, but a measurement of control on health determinants at the individual level was chosen: health literacy.\textsuperscript{26} To measure the effectiveness of the intervention on the evolution of health literacy, the Health Literacy for School-Aged Children\textsuperscript{27} will be used. Theoretical knowledge, practical knowledge, critical thinking, self-awareness and citizenship will be measured by 10 items (two items by dimensions) taking the form: I think I am well informed about health or I think I can compare health information from different sources and are rated on a Likert scale from 1 to 4: 1=not at all true; 2=barely true; 3=somewhat true and 4=absolutely true.

Data collection
The data will be collected sequentially depending on the respondent (see figure 1 for details). HP officers will complete the prequestionnaire during the engagement meeting (step 1) and the postquestionnaire at the end of the intervention, after the closing interclub event (step 8). The five managers and five coaches will complete the prequestionnaire during the project presentation meeting (step 4) and the postquestionnaire at the club review meeting (step 7).

Data analysis
Basic descriptive statistics will be calculated, including means, SD and frequencies. A comparison of HP perceptions and health literacy scores will be undertaken between different sports clubs and before and after the intervention of the same club, using multivariate and multilevel analysis to see the influence of sports club characteristics and the effect of the intervention on these variables. Within the sports club, variances will be analysed using intraclass correlation coefficients to document the intervention effects at each sports club level (managers and coaches). The R 4.1.2 software will be used for analysis.

Phase B: How will sports participants adopt the PROScESS intervention, and how will it impact their physical, mental and social health?
A focus group can provide relevant information about the implementation and effectiveness of HP interventions,\textsuperscript{28} and will, therefore, be used to measure the satisfaction and effect of the intervention on sports participants’ health. The choice to conduct focus groups is explained by the diversity of the interventions that will be implemented.

Sample
Participants in one of the two sport club initiatives (see intervention description) will be invited to participate in the focus groups (between 6 and 12 adults). If the initiatives target minors, parents will be asked to participate. A total of 60 focus groups (two per sports club) will be carried out.

Measurement and data collection
An interview guide generated by the research team focusing on satisfaction with the initiative and strategies, intention to continue the initiatives and health benefits (physical, mental and social) related to participation will be used to conduct the focus groups. Focus groups will be held at the end of the implementation of HP initiatives (after step 6).

Data analysis
Focus groups will be fully transcribed and analysed using an inductive data analysis with the Nvivo V.12 software.

Phase C: How will the adherence to implementation and the number and type of strategies used to influence changes in the HP perceptions and health literacy of HP officers, managers and coaches, as well as in participants’ health?
A QUAN+QUAL (qual) design will be used to answer this research question. Semistructured interviews and implementation data collection will be used to see how adherence to the intervention implementation and the number and type of strategies influences the evolution of HP perceptions and health literacy of HP officers, managers and coaches. Focus groups will also be used to discuss perceived changes in sport participant’s health due to the implemented intervention (eg, if a sports club increases messaging to participants about the recommended amount of physical activity, has this messaging, in fact, increased sports participants frequency to visit the club?).

Sample
Interviews will be conducted with each HP officer, 30 total interviews. The questionnaire and focus group data sample will be identical to those described above (30 HP officers, 150 managers, 150 coaches and 60 focus groups with 6 to 12 persons each) (see a sample of phase A).

Measurement
HP perceptions and health literacy questionnaires and focus groups have been described above (see the measurement of phases A and B).

Semistructured interviews will be conducted with an interview guide based on the PIET model,\textsuperscript{29} which studies the transferability of an implemented research design and its ability to be deployed in another context. Four criteria are identified: the population (what are the characteristics, needs and attitudes towards the intervention), the intervention in its context (characteristics, design, strategies and implementation), the environment (physical, organisational, partnership, barriers/facilitators) and the transferability (which process, needed improvements, which strategies to prioritise, learning objectives). Although four criteria are described, the analysis will focus only on data related to the choice of strategies (type and number). The other criteria will be analysed to answer the research question from Phase C.

The implementation data will be collected according to two criteria: (1) the ability to participate in the...
standardised steps through a tracking file which will inform the number of steps that have been completed, and the recording meeting, which will inform the time spent on each step and (2) the choice of strategies (type and number), captured by the goal-setting tool used in step 3 and the tracking file.

Data collection
Semistructured interviews will be carried out at the end of the intervention (after step 8), and the implementation data collection will be carried out throughout the intervention (eg, continuous collection of emails, Short Message Services, meeting recordings and collection of tools). The data collection related to the questionnaires and the focus group is the same as that described above (see data collection of phases A and B).

Data analysis
The semistructured interviews (fully transcribed), the tracking file and the diagnostic tool will be deductively analysed using NVivo software to code the elements that inform the use of strategies (the type and number from the HPSC intervention framework). Finally, the tracking file and the recordings from the meetings will make it possible to inform the number of steps which were carried out and the time granted to each one. This qualitative data will first be analysed to provide information on how the strategies are implemented in practice (eg, the COMMUNICATION strategy is often done via social media) and on the adherence to the standardised steps (according to the number of steps realised by the sports clubs on average and the time granted, it will be possible to consider the level of adoption of the standardised steps). These data will then be quantified, and statistical analyses will be performed. In addition to calculating basic descriptive statistics, including means, SD and frequencies, linear regressions will be performed using R V.4.1.2 software to inform a possible association between different contexts and the implementation of the intervention.

Phase D: How do the different contexts of the 30 sports clubs influence the implementation of the intervention, including the choice of strategies, the initiatives that were undertaken and the transferability of the PROSCeSS intervention?

Implementation of complex interventions is dependent on the context: ‘a set of characteristics and circumstances that consist of active and unique factors that surround the implementation effort’ can impact the intervention and, therefore, its effectiveness. To study this phenomenon when implementing the PROSCeSS intervention, mixed-methods in the form of QUAL (quan+qual) will be used. The sports club characteristics questionnaire, semistructured interviews and implementation data collection will be used to see how different contexts of the sports clubs influence the implementation of the PROSCeSS intervention.

DISCUSSION
Sports clubs are relevant settings for HP. However, several challenges limit the exploitation of their full potential and the generalisation of intervention results. The present protocol proposes an avenue to overcome these challenges and presents how the use of a type 3 hybrid design
considers the influence of the context and process of intervention implementation and a strategy to link them with intervention effectiveness. The collection of qualitative and quantitative data and their cross-referencing will make it possible to better understand how to implement an intervention of such complexity (multilevel and multideterminant). This helps to demonstrate the relationship between intervention implementation and effectiveness, offering methods to develop appropriate approaches to evaluate HP interventions.

This work also addresses why HP interventions should be theoretically grounded by providing an understanding of the complexity of the social–ecological approach in relation to the sports club context. Thus, the HPSC model and framework will consider contextual contingencies specific to the setting and bring about sustainable changes in the sports club by impacting the different levels and determinants of health that comprise it.

Beyond addressing the limitations identified in the literature and establishing the sports club as a setting for HP, this project aims to offer significant added value to society. The development of an intervention based on the core activity of sports clubs (providing sports activities) could lead to a cascade of benefits that would ultimately benefit society as a whole: improved overall population health, reduced healthcare costs, reduced costs associated with physical inactivity and reduced mortality. In addition, this study could also favour the development of more generalisable HP interventions in sports clubs and inspire the evaluation of interventions that include external levels, such as sports federations, political actors or HP actors.

Acknowledgements The authors would like to thank the various French health and sports professionals who contributed to the development of the PROSCeSS intervention and who provided in-depth knowledge of the sports club, the institutions such as Santé publique France, Université de Lorraine and Université Côte d’Azur, which have supported the project from the outset, as well as the various institutions that make it possible to partner with the sports clubs.

Contributors BT, FG, AV, SJ, FL, FR, AVH are part of the team and have made substantial contributions to the conception of the protocol design and gave feedback on the manuscript. BT wrote the manuscript. AVH, FG, AV, SJ, FL, FR read and approved the submitted version of the manuscript.

Funding The project is funded through a partnership between Santé publique France, Université Côte d’Azur, and Université de Lorraine and through a doctoral grant from the Grand-Est Region and the Pole Biologie-Sciences Santé of Université de Lorraine. This funding source had no role in the design of this study and will not have any role during its execution, analyses, interpretation of the data or decision to submit results.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

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REFERENCES
14 McFadyen T, Chai LK, Wyse R, et al. Strategies to improve the implementation of policies, practices or programmes in sporting organisations targeting poor diet, physical inactivity, obesity, risky alcohol use or tobacco use: a systematic review. BMJ Open 2018;8:e019151.


Annexe 1: Items concerning the characteristics of the sports club

How many licensees does your club have?
How many coaches does your club have?
How many managers does your club have?
How many employees does your club have?
What is the maximum skill level trained within your club?
What is the number of categories (e.g., baby, young, senior)?
What is the approximate budget held by the club?
How many training sessions are offered per day/week?
How many partners does your club have?
Annex 2: Items concerning the respondent’s role in the sports club

A. Coach
1. How old are you: _____ years old
2. What is your gender? Female ☐ Male ☐
3. How much time do you spend training this sport per week? _____ time
4. What is your highest level of competition as a coach?
   ☐ Departmental ☐ Regional ☐ National ☐ International
5. How long have you been training this sport? ________ year(s) ________ month(s)
6. Do you volunteer with your club? ☐ Yes ☐ No

B. Manager
1. How old are you: _____ years old
2. What is your gender? Female ☐ Male ☐
3. How long have you been involved in this sport? (Indicate the number of years or number of months (specify)) ________ year(s) ________ month(s)
4. Do you volunteer with your club? (By indicating “no”, it means that you are salaried or compensated)
   ☐ Yes ☐ No
5. If yes, how much time do you volunteer with this club? (How much time per week)
   ☐ 0-5 hours
   ☐ 5-15 hours
   ☐ 15-25 hours
   ☐ 25-35 hours
   ☐ More than 35 hours