The implementation of intersectoral community approaches targeting childhood obesity

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General discussion

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The aim of this discussion is to further explore the results and practical implications of this dissertation; both for IACO implementation in general and for implementation within each of the five sectors introduced in chapter one in specific. Sector specific findings will be illustrated by means of the vignettes presented in the introduction.

Were the IACOs implemented as intended?

The measurement and comparison of implementation degree across IACOs proved to be challenging in our studies. The paragraph below illustrates how we came to conclude that (1) there is still no golden standard on how to use or operationalize indicators of IACO implementation, that (2) we were not able to verify if most of the IACO activities prescribed were implemented as intended because they were not protocolled, (3) adaptation of IACO activities might be necessary to ensure a good fit with the local context, and that therefore (4) it might be better to measure conceptual use instead of mechanical use (such as strict adherence to protocol) to determine implementation integrity.

First, we struggled with the decision on which indicators of implementation degree we would measure. In our systematic literature review we found a diverse pallet of indicators. Even if the same indicators were used across studies, their operationalization varied greatly. We therefore could not derive the 'golden standard'[1]. After rigorous debate, we decided to measure implementation indicators as described in the widely cited implementation indicator framework of Peters *et al*.[2] We measured the degree to which the IACO was put into practice and referred to this indicator as 'adherence'. We however also used 'completeness' to refer to this degree of implementation in *chapter 4,* as peer-review feedback indicated that this term was more familiar to the intended target audience of that particular journal. This underlines our review finding that even within the relatively small field of research on health promotion implementation, the use and operationalization of implementation indicators is still fuzzy. This fuzziness gives rise to Babylonian language confusion, and makes comparability and replication of study results difficult. We therefore argue that researchers should strive to reach and adopt consensus on the use of implementation terminology and its operationalization, for example by further developing the consensus on implementation measurement indicators proposed by Rabin *et al*[3].

The second challenge we faced was the striking difference in the number of IACO activities prescribed to local stakeholders included in our study, and the level to which these activities were protocoled. Stakeholders embedded in three out of five of the included IACOs were prescribed only a small number of activities and were only provided with general instructions on how to execute the activities prescribed (i.e. *organize an activity to*

stimulate physical activity). We argued that simply recording if *'an activity to stimulate physical activity'* was performed would not provide optimal insight into IACO implementation integrity. We therefore asked project managers from those IACOs that prescribed only non-protocoled activities to provide additional details on those activities. This approach of further enquiry also supported our semi-action research design[4,5]; one of the project managers for instance mentioned during an interview that *"By providing additional details, I was challenged to contemplate further on what we wanted exactly from local stakeholders. This sharpened my focus"*. Project managers were however unable to provide additional details for one third of these activities. We then decided to consider this as a true reflection of the IACOs implemented, and included all activities prescribed, both protocoled and non-protocoled, in our so called 'yes/no implementation adherence checklist' that was filled out by stakeholders at several moments in time. However, the inclusion of these non-protocoled activities gave rise to the question how we would ensure we were not comparing cheese with chalk. In our quantitative study, the issue of comparing 'cheese with chalk' became apparent. We wanted to compare implementation degree across IACOs and evaluate the relation between determinants of implementation and implementation degree. Descriptive analysis however confirmed our observation that the number of activities prescribed per IACO and stakeholder ranged widely, and that the number of activities was negatively associated with the level to which activities were protocoled. We attempted to prevent the 'comparison of cheese with chalk' by including the number of activities prescribed as a determinant in our multivariate analysis. This analysis revealed that the number of activities prescribed was indeed significantly associated with implementation degree. If more activities were prescribed, this was associated with a lower degree of implementation. On the one hand this sounds logical; it has been reported that if a high number of activities is prescribed, this can enhance a feeling of complexity and thereby hinder implementation[6-8]. However, a low number of non-protocoled activities can also cause procedural unclarity and lead to unsuccessful implementation[9]. The association between the number and level to which the prescribed activities were protocoled might also be explained by two forms of measurement bias. First, statistical measurement bias. If more activities are included, the chance of one not being completed rises. Second, content measurement bias. Imagine a stakeholder who implements 70% of the prescribed *'activity x'*. If this stakeholder is asked to indicate whether '*activity x was implemented as a whole*', he might be more prone to answer in the positive (and thus receiving an 100% completeness score) than if a stakeholder is asked to indicate for all elements of *'activity x'* separately whether they are implemented. So although we made significant effort to develop valid indicators for the assessment of degree of program implementation, considering the before mentioned potential biases and the association found, the question remains whether we succeeded. One innovative approach proposed by Hawe *et al.*[10] might provide leads on how to measure implementation degree

across IACOs in future studies, without risking comparing cheese with chalk. Hawe *et al*.[10] argue that the implementation of complex interventions should not be viewed as 'one-dimensional, program delivery' but rather as a 'complex event in systems'[11-13]. In line with this view, they do not approve the measurement of 'classic' fidelity as described in the Research & Dissemination (R&D) paradigm[14]. They feel the measurement of such fidelity does not do justice to the good intentions of stakeholders who abandon implementation fidelity by adapting activity elements. They instead state that stakeholders know best how their 'complex system' resides, and how elements can be adjusted and embedded in such a manner that intervention effect can be preserved. In classic fidelity measurement, adaptation lowers the fidelity score because the element is then not performed as prescribed by the developer. However, especially for complex interventions, adaptation of elements by stakeholders who are skilled and knowledgeable with regard to the intervention (known as 'conceptual use'[15]) has been associated with increased program effect. These adaptations might then not be put away as an undesirable lack of fidelity[24;28;34;40-46]. Hawe *et al*.10 further state that one should therefore not measure to what degree an activity protocol is implemented, but to verify if intervention functions (which could be reached via a variety of activities) are implemented with fidelity. Hence, intervention theory instead of intervention protocol is informing the design of the IACO process evaluation. This would allow room for adaptation by local stakeholders in accordance with the local context, as well as a more valid evaluation of implementation integrity. Nevertheless, as mentioned before, IACO activities were mostly not protocoled. It therefore might also be difficult to distillate if and which intervention theories underpin these activities. We therefore argue that although intervention theory might be a more appropriate basis for the assessment of IACO implementation integrity. This implies that a clear description of IACO activities is still needed to identify which intervention theories should be tested.

Also in our we could not yet determine on which intervention theories certain program elements were based. We were therefore not able to make a clear distinction between favourable and unfavourable adaptations of certain program elements. In general, we know to some extent which activities can contribute to a decline in childhood obesity[16-21] but not which specific activities are most critical for the decline[17]. Especially for complex community programs such as EPODE-derived IACOs, it remains unclear which IACO activities are needed to reach the intended intervention effect. Moreover, in our study we could not determine if stakeholders were skilled and knowledgeable enough to determine which and how elements could be adjusted without loss of implementation integrity. In accordance with Durlak[22], we would therefore advise future research initiatives to elucidate which intervention elements and related conditions for effective application have to be taken into account in order to reach the desired health-related impact by EPODE-derived IACOs. The recent WIDER checklist published by Albrecht *et al.*[23] could provide opportunity

for the EPODE national agency, in close collaboration with IACO project managers, to better describe the conditions for effective implementation at the local level. We moreover advise future researchers to take into account the adaptation/fidelity debate, and untangle how and if conceptual use and thus possible adaptation of certain activity elements can lead to improve the impact of IACO interventions.

Which determinants influenced IACO implementation?

We identified a variety of IACO implementation determinants across studies. The Fleuren model[9] proved partly sufficient to categorize these determinants. Some determinants we identified were however not included in the original model. To accurately categorize these new determinants and remain true to the specific characteristics of IACO implementation, we added the category 'intersectoral collaboration' to the Fleuren model and amended the category 'social-political context' into 'community & context'.

Some of the IACO determinants identified were found to be critical in multiple sectors, whereas other determinants were only found to affect IACO implementation in one (or two) specific sectors. A determinant was considered to be a relevant target for change in multiple sectors if it was found in at least ≥3 out of 4 sectors (table 1).

Which determinants were found to influence IACO implementation in multiple sectors?

Determinants of the professional

Perceived ownership (participants expressing they felt "personally tied or attached to IACO goals"[24]) and high perceived importance of IACO goals were identified as key facilitators to IACO implementation across sectors. These associations have been widely reported; for health promotion innovations[25], complex community programs[26,27] and also IACOs in specific[28]. However, our data revealed that implementers who were less successful also stated that they felt high ownership towards IACO goals. This could perhaps indicate that high ownership is a condition for successful implementation, but not decisive per se. This presumption is reinforced by the causal configurations of determinants we identified in our qualitative studies, which for instance indicate that the combination of (1) high ownership, (2) sufficient possibilities to adapt, and the absence of (3) any perceived barriers leads to implementation success. Hence, 'the whole might be greater than the sum of its parts"; and ownership should possibly be not considered in isolation. This hypothesis that the whole might be greater than the sum of its part is partly supported by research from Armbruster *et al*.[27]. They found that the feelings of 'ownership' and 'participation in program development and planning' were interrelated; (early) participation in planning and development led to a better fit of the intervention with the needs and wishes of the participant, increasing

ownership of intervention goals. In line with another recent review of reviews[29], one could then argue that IACO implementation might be optimized by formulating multi-faceted innovation strategies targeting a combination of interacting determinants, including ownership. We however support the vision as expressed by Harvey & Kitson[30], that it is not an either/or discussion. Instead, implementation strategies for complex intervention should consider implementation as a complex process and formulate implementation strategies, multifaceted or single, accordingly.

Stakeholders' self-efficacy towards IACO implementation was also found to influence IACO implementation across sectors. This finding is relatively new for integrated approaches; the association has only been addressed by one other IACO implementation study.[31]. That being said, several other health promotion innovation studies[32-34] and implementation theories[35],[36] do confirm the association found between self-efficacy and implementation success. We furthermore found indications that especially high self-efficacy in combination with high ownership leads to a higher implementation degree. Few studies have researched if and how self-efficacy in combination with ownership influences (implementation) behavior[37]. Most implementation studies focus on elucidating which determinant influence implementation, and not on which or how determinants intertwined or jointly lead to implementation success. This, again, addresses the issue of 'the whole being greater than the sum of its parts', and the need for more research on how determinants jointly or in interaction influence IACO implementation. In our studies, we aimed to bridge this gap by using an adapted version of QCA to evaluate if determinants in configuration could lead to a specific outcome. This provided us with indications that in some cases, determinants in configuration rather than stand-alone determinants influence IACO implementation. Because of the limited number of cases that could be studied, no definitive conclusions can be drawn from our QCA results. Hence, we consider the use of QCA in our study as an important step forward towards elucidating if 'the whole is greater than the sum of its parts', but we feel that there is still a world to be conquered. We argue that the adapted version of QCA should be tested using a larger number of cases, and that its methodology should be further refined for use in IACO implementation studies. A next step would then be the translation of QCA findings into implementation strategies, which could further inform the debate mentioned earlier on the use of multifaceted or single implementation strategies.

We found that time of experience with IACO implementation was positively associated with implementation adherence; Stakeholders who implemented the IACO activity for more than twelve months showed a higher implementation degree in comparison to novel implementers (<12 months of experience). Rogers also mentioned this association between time and implementation success in his diffusion of innovations theory[38], stating that stakeholders who sustain implementation are most often better

implementers. So what could explain this association found between time of experience and implementation succes? We argue that selection bias might mediate the association found. Those stakeholders that sustain implementation are perhaps on average more motivated to implement the innovation, and therefore might be better implementers. The health promotion implementation literature remains indecisive about the direction of the association between time and implementation success. Young *et al.*[39] found that implementation of the IACO 'TAAG' improved over time, whereas two other studies[40,41] reported that the implementation of a health promotion program in schools worsened over time. However, for IACOs in specific, Bolton *et al.*[42] reported that the 'allocation of sufficient time for implementation' was one of the key factors to reach (continued) implementation success. We argue that more longitudinal IACO implementation studies are needed to further elucidate the relation between time and implementation succes. This also provides oppurtinity to verify if other determinants mediate the relation between time and implementation succes, for example by using the previously mentioned QCA method.

Innovation

A 'high compatibility of the activities prescribed with existing working procedures' and 'possibilities to adapt IACO activities to improve their fit with the local context' were identified as key facilitators to IACO implementation across sectors. We feel this finding further strengthens the recommendations we made with regard to the fidelity/adaptation debate described earlier in this discussion. Stakeholders strongly express that multiple possibilities to adapt and high compatibility of activities with their existing (work) procedure facilitates their implementation efforts, but it is not yet known which activities can be adapted (and to what level) without loss of fidelity and intervention effect. More research is thus needed to determine which activities (elements) are critical for intervention effect, and how implementation integrity can be evaluated if (certain) adaptations are not considered as a loss of fidelity. If we dive deeper into the issue how IACO activities should or can be adapted, research indicates that adaptation informed by both top-down (for example project management or research) and bottom-up (local stakeholders) forces is most beneficial to the implementation of complex health promotion programs[43,44]. This approach is referred to as a 'mutual adaptation[45]'. A mutual adaptation approach also aligns with the principles of community participatory action research[4] (CPAR), as it provides opportunity to enhance the match between stakeholders' needs and IACO activities. In our opinion, a mutual adaptation approach guided by CPAR could create an optimal environment to successfully implement an IACO. However, as Muhammad *et al.*[46] recently noted, power and identity equality between researchers and local stakeholders is an important prerequisite for this approach to be successful.

Organization

Our quantitative study revealed that formal ratification was negatively associated with implementation adherence in multivariate analysis, while a positive association was found in univariate analysis. In previous studies only a positive association was reported; that formal ratification was related to IACO implementation succes[47-53]. Because of this contradiction between the results of the univariate and multivariate analysis, we explored these findings from our quantitative study further. The correlation matrix then revealed that formal ratification was only negatively associated with implementation adherence for educational sector stakeholders embedded in communities A or B. This means that in multivariate analysis, the regression weight of the determinant 'formal ratification' was heavily affected by 'educational sector membership'. This association between formal ratification and sector membership is not reported in earlier studies. However, the Centre for Disease Control (CDC) does emphasize in their report "*Make a Difference at Your School*" that one of first steps of successful implementation of health promotion programs in schools is the inclusion of (specific) health promotion goals in the schools' policy[54]. One other possible explanation for the negative association found is that the presence of formal ratification might indicate that the intervention was implemented top-down. in previous studies, a top-down implementation has been related to lower degrees of continued implementation[55]..

Community & context

We found that if partners were more equally distributed across sectors in the network, this was associated with a higher implementation degree. We also found that a higher level of network centralization, meaning a high level of variation in the number of ties per network partner, was related to a lower level of implementation degree. These findings can both be explained if one considers the association frequently reported between these network characteristics, network stability and continued implementation success. If a network is stable and partners continue to work jointly towards network goals, this associated with higher levels of continued implementation. A centralized network, as we found in our study, has however been associated with a decrease in network stability over time[56], and might therefore have contributed to a decrease in implementation degree over time. Especially if the involvement of the most central partner is dependent on external resources, the network is more likely to become unstable and implementation degree will decline if resources are cut[57].

An equal distribution of partners has also been associated with a more stable network over time, and in turn a better chance at continued implementation success. We argue that an equal distribution of partners might enhance network stability because the network is not dominated by one particular sector on which other sectors depend for continued collaboration and implementation. Also, the network might be more stable as sector

involvement, is for the greater part not dependent on a single actors' collaborative effort. Then, the retreat of one partner does not cause a complete sector to be eliminated from the network. We therefore advise future IACO project managers to stimulate the participation of stakeholders from a variety of sectors within the community. That being said, it should be noted that network development within complex interventions is complex and is not only influenced by the network characteristics mentioned above[58]. Other factors such as trust, knowledge about the other organisations[59], feeling a shared commitment for action and cohesion in the network can also influence network stability and output[60]. More research is needed to verify which factors are most important to enhance IACO implementation success, and which of these factors are mediated by levels of network stability.

Practical implications

- Next to an intervention action plan, we advise practitioners to develop s**trategies for the implementation** of their IACO in close collaboration with local researchers (for example from the Municipal Health Services (GGD)) and local stakeholders. These strategies should then be revised and adapted regularly to ensure their fit with the needs and wishes of the local context. The implementation of an IACO is complex and without such a dynamic plan, implementation failure is a much greater risk.
- In accordance with a recent study by Bolton *et al*.[42], we urge that **sufficient time should be allowed** for IACO implementation. EPODE only showed results after ten years; it takes time to build a lasting network and most implementers need time to get acquainted and be successful IACO implementers.
- Across sectors and in time, **high ownership of IACO goals** and **feelings of high self-efficacy** towards implementation were related to IACO implementation success. We therefore advise to take these determinants into account when developing implementation strategies. Self-efficacy for instance has shown to be enhanced by regular coaching sessions throughout the implementation process[61], whereas ownership of clinical guideline use was enhanced by ensuring that practitioners were involved in the development of the guideline.
- We found that if **collaboration with community stakeholders** is perceived as fruit- and successful, this was related to implementation success. It might therefore be wise to stimulate solid collaboration, for example by organizing regular stakeholder meetings and making the benefits of collaboration visible to stakeholders.
- **A non-centralized network** was related to implementation success. We therefore advise to not let only one stakeholder (for example the project manager) be central to the rest of the network partners, as this might jeopardize a feeling of shared responsibility for implementation and network stability overtime.

Table 1. Overview of key determinants for IACO implementation in multiple sectors, per sector and during initial or continued implementation

	Professional		Innovation		Innovation strategies		(Intersectoral) collaboration		Organization		Community & Context	
	Initial	Continued	Initial	Continued	Initial	Continued	Initial	Continued	Initial	Continued	Initial	Continued
Common for multiple sectors	High Ownership[4,5] High self-efficacy[5,6] Long-time of experience with IACO implementation (>12 months)[5]		High compatibility working procedures[4] Sufficient possibilities to adapt[4] High number of activities[5] Incompleteness[6]						Formal ratification IACO[5]		Equal distribution of actors per sector[7] Centralized network[7]	
Educational sector	Lack of time /resources[6]	Low priority for implementation[4,6]	Low instrumentality[6,4] Implementation causes disadvantages[4]		Lack of reinforcement strategies*[6]							
Private sector	Feeling morally obligated[6]		Lack of observability of implementation[6]				Lack of shared commitment[4,6] Solid external collaboration[6]		Goal compatibility (barrier[4], facilitator[6])	High turnover of staff[4]		Low participation of target population[4]
Health care sector				disorganization IACO[4]		Regular evaluation of implementation[6]			Organizational turbulence[6]	Coordinator for implementation available[4]		Limiting factors target audience[4]
Welfare & sports sector				Advantages caused by campaign use[4]			Unsolid external collaboration[6]		Insufficient financial resources[6]	High goal compatibility[4]		

[4] chapter 4, [5] chapter 5, [6] chapter 6, [7] chapter 7, *initial* initial implementation, *continued* continued implementation. Barriers in red, facilitators in green. If a determinant was considered a barrier in sector A and a facilitator in sector B, it was considered as a sector specific barrier or facilitator.

Which determinants are found to influence IACO implementation within a specific sector?

Educational sector

James, 52, primary school teacher

I strongly support the goals of the IACO; children should be healthy and fit! However, my students messed around with their water cans, which resulted in one very wet classroom. The cans also began to smell after a while; the children did not clean them very often. Moreover, the government rates the quality of our school based on the academic achievement of my students, not on the students' health status. Because I'm all ready short on time, I therefore commit the resources I have available to teach some extra mathematics. That leaves me with too little time to perform all of the IACO activities. I did integrate the water breaks and fruit moments into our daily class schedule. In that way, I was able to sustain some of the IACO activities over time.

An important finding of this dissertation is that in specific for the educational sector, determinants related to the professional and the innovation were found to be most influential to IACO implementation. Only for these stakeholders, 'limited time and resources' and a 'lack of priority for IACO implementation' were identified as key barriers. Hence, these stakeholders expressed that their sparse time and resources were committed to optimize students' academic achievement, leaving insufficient resources to implement IACO activities. Previous studies have also reported that a low priority for health promotion in the educational sector[62,63], partly caused by a government-led demand for and focus on academic acheivements[64,65] impeded the implementation of health promotion interventions. We argue that one possible solution to optimize IACO implementation within the educational sector is to make stakeholders, local policy makers and national government officials more aware of the strong positive association found between healthy behavior of children and academic achievements[66-68]. If this awareness then translates into a shift in government demand and funding, this could contribute to the prioritization of health promotion in schools.

Also solely for educational stakeholders, a 'lack of external aid and incentives to continue IACO implementation' was identified as a key barrier. Economic theory underlines this finding and states that the 'principal' (the innovation) needs to encompass procedures to incentivize the 'agents' (professionals) to optimize implementation[69]. Continued reinforcement, for example

in the form of (dis)incentives and iterative implementation support, is furthermore included in the recently published expert recommendations for implementing change[70]. Skinner[71] was one of the first to mention that behaviour change can be accomplished by providing rewards directly after a certain behaviour was performed. However, for this strategy to work properly, it is important to keep in mind that the reinforcement should be aimed at the behaviour, and not at the result of the behaviour[72]. For example, a teacher should be rewarded for the implementation of the regulation to eat healthy snacks during the morning break, and not for the number of children that are eating healthy snacks. So should we then instate as much external reinforcement strategies as possible to ensure (sustained) IACO implementation? We argue that this could potentially be harmful, and advise project managers to be cautious whilst instating such strategies. External reinforcement has namely been reported to decrease stakeholders' (potential) internal motivation to perform a prescribed behaviour[73]. This corroborated by one of the (sustainability) aims of EPODE, which states that to ensure continued implementation of an IACO, external reinforcement should be limited. Instead focus should lie with the establishment of community readiness, (lasting) resources and the recruitment of internally motivated local program champions[74,75]. Therefore, although professionals call for continuous reinforcement of IACO implementation, the form and level to which it is instated should be considered carefully to avoid a decrease in stakeholders' internal motivation to implement or a decline in available (human) community resources.

Practical implications

- James encountered negative effects of the implementation in his classroom. **A mutual adaptation approach**[45] or regular evaluation of his implementation might have obviated this problem, as James would have been consulted about his (negative) implementation experience and the activity could have been adapted in collaboration with James. **Piloting of the IACO activities prior to widespread implementation** might also have uncovered these issues.
- James named that implementation was impeded because the government appraises his school only on the academic achievement of its students. We therefore advise future IACO project managers to not only implement IACO activities on the local level, but also to try to **influence policy making at the local level**[76]. For example 'the healthy school' program that was launched by the Dutch government in 2013 could, if correctly timed and feasible, provided incentives to schools to facilitate the (continued) implementation of IACO activities[77].

- **External reinforcement and aid** for IACO implementation is important to James, as he indicated his workload is already overwhelming. In accordance with the Centre for Disease Control[54] we would advise to facilitate James' IACO implementation by establishing a school health counsel and/or to appoint a coordinator who could make plans and formulate strategies to reinforce (future) IACO implementation.

Health care sector

Fatima, 31, youth health care nurse

I was really happy that we could participate! My work is already focused on optimizing the health of children, so this program really complemented my other tasks. However, during the implementation of the IACO, our organization was merged with other youth health care facilities into the Center for Youth & Family (CJG). Times were quite turbulent; intervention materials got lost during the move and we needed to establish a new status quo. Initial implementation of the IACO was therefore troublesome. I also encountered that during previous interventions, parents and children were not always able to comply with IACO goals because of financial and behavioral problems. Some parents just couldn't afford to buy healthy food. Luckily, a coordinator was appointed in our organization for the implementation of the IACO. She send us emails with instructions on how to perform the activities prescribed, an how to tackle the hurdles we encountered. We also came together regularly to evaluate the progress of the IACO. That really helped me to (keep) the activities going!

A notable finding is that the key determinants to IACO implementation identified for this sector were mostly related to the match of the IACO with their regular practice or previous experiences. We for instance found that solely within this sector, IACO implementation was facilitated by the availability of an internal coordinator and regular evaluation of the campaign. However, the health sector was the only sector included where the appointment of a coordinator and regular evaluations were considered regular practice. Hence, the established regular practice within this sector encompassed certain conditions that were found to facilitate IACO implementation, also in previous implementation studies[50,78-80]. We do however argue that finding these determinants to be relevant only for this sector might be due to the concept of 'you don't miss what you don't know'. In other words, stakeholders from the other sectors might not be able to

asses which benefits the appointment of a coordinator or regular evaluation would have had on IACO implementation as they haven't previously experienced the benefits of these actions. Whether this assumption is true needs to be further examined.

Health care stakeholders also mentioned that their day-to-day work and the IACO activities prescribed were highly compatible, highlighting again the match with existing practice. It might be easier to implement health promotion activities in a sector which primary aim is already to optimize the health of children, then for example within the educational sector where the major aim is to optimize the academic achievement of children.

Finally, certain attributes of the target population, such as financial or behavioral problems, were only identified as key barriers to IACO implementation in the health care sector. Health care stakeholders for example mentioned that their clients did not have sufficient financial resources to buy healthy foods or that they were unable to comply with healthy diet suggestions. Several other studies reinforce our finding that target population attributes can affect IACO implementation[50,80,81]. We argue that the previous experience in this sector with financial or behavioral problems of the target population might explain our finding. A majority of the health care professionals expressed that during previous health promotion interventions, the target population was often not able to participate in activities or activate behavior change. These experiences might have given rise to a negative presumption about the these attributes of the target population while implementing this IACO, resulting in some degree of confirmation bias[82]. They therefore were perhaps more prone to watch for these attributes in the target population, and report them in the negative. Whether this bias was actually present, or whether compliance was actually worse or more important for stakeholders in the health care sector needs to be further investigated.

Practical implications

- Fatima named that her implementation was facilitated because the prescribed IACO activities fitted perfectly with her existing work assignments. This underlines the importance of a **proper fit of the IACO with the local context**.
- Turbulence within the organization caused a decline in Fatima's IACO implementation. Because of the turbulence, additional tasks such as IACO implementation were easily put on the back burner. Countering shared responsibility bias, it might help to **explicitly divide subtasks with regard to IACO implementation amongst stakeholders,** and to **send extra (email) implementation reminders** to encourage continued implementation efforts.
- According to Fatima, parents and children were often not willing to comply with IACO activities. **Training that touches on the possibility of non-compliance of the target population** and for example, teaching motivational interviewing techniques

to health care stakeholders could possibly increase stakeholders' self-efficacy towards addressing the non-compliance of parents and children and decreases their lack of implementation motivation[83].

- **Appointing an implementation coordinator or champion** and **regular internal evaluation** of the campaign were named by Fatima as facilitators to implementation. This highlights that organization wide support and commitment to IACO implementation can lead to greater IACO implementation success.

Welfare- & Sports sector

Jeffrey, 22, Youth welfare worker

I really tried to implement the IACO, because i feel that it is important to promote a healthy lifestyle in children. However, we had insufficient financial resources to implement certain IACO activities. We, as welfare workers, focus on many societal issues such as poverty and domestic violence, leaving little resources left to implement IACO activities. Also, collaborating with community partners to implement IACO activities was very difficult and time consuming. In my opinion, the benefits of IACO implementation did not outweigh the effort required to implement them. On the positive side; i do feel that we strive to reach the same goals as IACO project management. We both want children to feel good and happy and live long, healthy lives. That feeling makes me want to try hard to implement at least some of the IACO activities prescribed.

None of the key determinants identified for the welfare and sports sector were related to the professional. Primarily external determinants (related to the organization, innovation and to organizational collaboration) were found to be of importance to reach IACO implementation success in this sector.

One of the key barriers to implementation for this sector was a lack of financial resources. To our knowledge, this barrier was not previously cited as a barrier typical to the sector welfare- and sport. It has frequently been reported to impede IACO implementation in general[49,50,80,84-86]. Finding this barrier for the welfare and sports sector might be due to the large dependency of this sector on external (government-based) subsidies. The economic recession that occurred in the Netherlands during the time of our study[87] led to a significant decrease in governmental support. Especially subsidies that were not considered to promote so-called 'fundamental needs' (i.e. health care and education) were cancelled. As IACO project management did not provide financial support and welfare- and sport sector

activities were not considered 'fundamental' and thus not eligible for government support, this sector was hit hard by the financial recession. This sector might therefore have had more trouble to generate sufficient finances, explaining why this identified as a key barrier to IACO implementation for this sector. We should however emphasize that if subsidies are cut or withdrawn, IACO implementation can be jeopardized in all sectors that are dependent on this external financial support.

Unsolid collaboration was found to be a key impeding determinant to implementation only for welfare- and sports sector stakeholders. A quote from one of the welfare professional we interviewed reflects the opinion of the majority of professionals from this sector: *"I have the feeling that everyone is operating on their own little island, and are not willing or able to make a collective effort".* Previous studies have reported that unsolid collaboration can be due to a lack of shared professional repertoire; professionals embedded in diverse sectors often experience difficulties whilst collaborating because they struggle to comprehend the other sectors' goals and vocabulary[88]. A deepening of the relationships between IACO implementers from diverse sectors can potentially tackle these hurdles, facilitate communication and increase the power and magnitude of the collective effort[89]. However, if for example implementers are embedded in other sectors, the deepening of the relationship might take a considerable effort. It should then be closely monitored if the benefits of improving the relationship outweigh the effort and resources instated to establish this outcome.

Practical implications

- Jeffrey stated that insufficient financial resources were present to implement the IACO, as the welfare sector only has a limited budget to focus on a broad range of societal problems. Mutual adaptation could possibly have countered this problem, as the IACO activities could have been adapted and made less costly. **Joint problem ownership** between these stakeholders and project management might then have led to a more feasible IACO activity.
- Jeffrey expressed that collaboration with other stakeholders remained unsatisfactory. **Regular meetings** stakeholders from other sectors to evaluate IACO implementation with might better the collaboration between partners. Also, enabling stakeholders to investigate during these meetings what **they could gain from collaboration** and IACO implementation, and how they could accomplish these gains has been shown to optimize collaboration.
- According to Jeffrey, **high compatibility** between the goals of the IACO and the goals of the youth welfare organization was a key facilitator to implementation. This compatibility also gave rise to certain **advantages,** for example that some

organizational goals could be reached by implementing IACO activities. Enhancing or sustaining this level of compatibility seems key to sustain IACO implementation in this sector.

Private sector

Ellen, 38, manager supermarket (national chain)

I want to be a socially responsible entrepreneur! I do not solely want to make a profit but I also want help solve societal problems such as obesity. Also, the IACO activities I implemented granted me opportunities to meet new potential business partners and extent my clientele. So for me, it felt like a win-win situation. I however didn't always feel like we were 'in it together'. That we as community stakeholders made a collective effort to implement IACO activities. That lowered my implementation to implement the IACO. My supermarket also faced a high turnover of staff, and it was not possible to communicate to all our (part time) employees about how to implement IACO activities. So sometimes children came to our supermarket to get fruit free of charge, but didn't receive any because the employee was aware of the activity. And even so, not many children were interested in the 'fruit free of charge' activity. They'd rather buy candy or cookies using their own money.

In specific for the private sector, determinants related to 'intersectoral collaboration' and the 'community and context' were found to be of influence to IACO implementation.

The non-compliance of the target population was only identified as a key barrier to implementation for private sector stakeholders. Health care stakeholders named specific attributes of the target population (such as behavioural and financial problems) that impeded their uptake of the intervention, whereas private sector stakeholders only named that the target population did not attend their events or did not buy healthy foods without naming a cause of the non-compliance. Private sector stakeholders mentioned that the non-compliance of the target population led to a misbalance between their effort to implement the IACO and the benefits gained from implementation. A local supermarket for example started a campaign to promote fruit consumption and provided fruit for free to children, intending to target childhood obesity as well as attract new clientele. Very few children were however interested in the campaign and the supermarket was thus not attracting new clientele. In the end, the campaign was therefore halted due to a lack of response from the target population. This pitfall of lack of consumer response is widely cited as one of the major challenges of intersectoral obesity prevention[90].

We furthermore found that solid collaboration between community partners was a key facilitator solely for stakeholders embedded in this sector. This might be related to characteristics of the IACO activities prescribed to this sector. In contrast to the educational- and health care sector, most of the activities prescribed to private sector stakeholders required a high degree of intersectoral collaboration. On the other hand, the relative high importance of these determinants to the private sector could also be related to a major aim unique to this sector: namely 'making a profit'. Solid intersectoral collaboration, but also other key determinants identified for this sector such as a 'lack of shared commitment' and a 'lack of visibility of implementation efforts to other stakeholders', are all linked to in- or decrease of profit. Collaboration and shared commitment for instance creates opportunity to meet new potential business partners and to expand business. Moreover, observability of their implementation efforts provides opportunity to convey their 'high level of corporate social responsibility' which might attract potential clients. These conditions (solid collaboration, shared commitment, observability) can thus lead to potential external rewards (meet new business partners, extent clientele) that in turn can optimize their profit. This might explain why the presence or absence of these determinants is related to implementation success for this particular sector. Finally, feeling morally obligated to implement the IACO was identified as a key facilitator to the private sector. This could be due to the closing of the gap between private- and public enterprises; more and more private sector stakeholders voice a feeling of joint responsibility for societal issues[91]. However, although viewed as an essential component of current and future health promotion initiatives[91-93], tensions caused by for example conflict of interest within public-private partnership have been widely reported[94]. These partnership structures therefore need to be closely monitored, and transparency of expectations and goals of both the public and private partners is of great importance[94].

Practical implications

- IACO implementation makes Ellen feel like a **socially responsible entrepreneur,** which facilitates her implementation. Also, she named that **benefits gained** by implementing the IACO (new business partners, extending clientele) motivated her to implement. We would therefore advise to engage potential private partners by **together exploring both the personal and organizational benefits** to be gained. This insight into IACO implementation benefits could then potentially lead to more successful implementation efforts[9].
- Although Ellen felt that she had opportunities to meet new business partners, she did not feel like community stakeholders had a shared commitment towards IACO goals. Creating shared commitment between community stakeholders **through**

transparency and honesty[92] could be accomplished by creating a **group community identity**[95], for example by organizing IACO network meetings (starting with a kick-off meeting).

- Children were not always eager to participate in IACO activities. We argue that private partners should be informed prior to IACO implementation about the possible difficulties they could encounter when engaging children (and parents) in activities promoting a healthy lifestyle. We feel that thus that **expectation management,** in combination with **empowering of private partners** by for example indicating that their marketing skills could be useful when persuading children to buy into IACO activities, is key to successful IACO implementation.

Conclusion

The translation of an IACO into practice is a complex and dynamic process. Both the community context and, in turn, IACO program plans change frequently. This makes the implementation of IACOs more prone to error and deviation and implementation failure a genuine threat[96-101]. IACO process evaluation is not yet standardized. We encountered methodological difficulties when assessing IACO implementation degree and determinants. This underlines the need for IACO program management and the national EPODE bureaus to provide a detailed operationalization of (theory underpinning) the IACO activities and objectives they prescribe. This would also be a prerequisite for the planning of an adequate IACO process evaluation. However, to perform such a process evaluation, more 'research on how to perform IACO implementation research' is also needed. Based on the growing knowledge base and the results and instruments used in this study, not a golden standard but a 'golden toolkit' containing a broad spectrum of IACO process evaluations methods and measures should be established. Researchers, project managers and local stakeholders can then pick and adapt those methods and measures from the toolkit that are most salient to their setting and needs, allowing for a tailored and scientifically substantiated IACO process evaluation. Also, by enhancing uniformity in operationalization of terminology and measures, the 'golden toolkit' can potentially enhance the comparability of IACO process evaluation results. We furthermore found indications that different determinants influence IACO implementation success across sectors and over time. Thus to optimize implementation, we argue that an IACO implementation plan should not be formulated using a 'one size fits all' approach. Instead implementation plans should be tailored to the determinants identified per setting and sector, and should be adapted iteratively informed by the dynamics in local implementation experiences. Preferably, we argue that community based action research[5] based on a mutual adaptation strategy[45] should be instated to account for feedback on how change is progressing over time. These strategies enable IACO

program management, local community stakeholders and researchers to jointly evaluate and making informed decisions about the need for and how-to adapt implementation plans.

Advise for future research initiatives

We used mixed-method research to elucidate which determinants influenced the IACO process. This allowed us to gain both an in depth and broad understanding of the determinants that lead to IACO implementation success or failure. Although quantitative analysis was possible in our study, the number of cases we could include was limited and results of this analysis should therefore be interpreted and extrapolated with caution. We advise future researchers to upscale the quantitative part of their research and include more IACO implementers from a larger number of communities, for example by collaborating more closely with the EPODE national bureau. Our study is one of the first to follow IACO implementation at the community level over time, which provides us with very useful insight into how determinants differ over time and across sectors.. We were however unable to follow IACO implementation efforts of the same stakeholders longitudinally, as a number of stakeholders declined participation after the first measurement due to research fatigue[102]. A high turnover of staff and frequent policy changes were also opposing the longitudinal study of IACO implementation. We consider these congruent to IACO implementation and maybe even inevitable because of the dynamics and ever-changing character of IACO implementation. Nevertheless, it would be interesting to verify if our finding that IACO implementation determinants differ over time and for sectors is also true when following the same stakeholder at multiple points in time. Moreover, although not all factors opposing longitudinal research within IACO implementation are changeable, perhaps research fatigue could be countered. Making sure participants are not approached by different research teams with similar research questions, providing participants with feedback on the results, but also ensuring that research participation leads to visible changes or personal advantages might reduce research fatigue[103].

We furthermore used purposeful sampling[104] to select study participants. Taken into account local opportunities, we feel that this sampling method was most suitable to obtain a representative sample, but it still might have caused some form of selection bias[105,106]. Stakeholders that declined (further) participation often stated they suffered from research fatigue[102] or time constraints. Hence, it might be that participants who did agree to participate were more motivated to implement their IACO (and thus to participate in our study) or felt less strained by their workload. As random sampling within implementation studies is difficult, it might be advisable to use a multi-stage purposeful sampling strategy. This strategy is combines iterative (re)sampling focused on the creation of variation (stratified purposeful) and similarities (criterion-i sampling) amongst included implementers[104]. In

this way, selection bias can be countered and optimize internal and external validity. We used Social Network Analysis (SNA) to explore the impact of network development on IACO implementation. Studies on network development in communities implementing intersectoral approaches are sparse[107,108], and to our knowledge we were the first to address network development in communities implementing an IACO. Intersectoral collaboration is one of the key features of an IACO, and we feel that incorporating network analysis into an IACO process evaluation is therefore necessary to truly understand its implementation process. Network analysis is however a complex technique not commonly practiced by health promotion researchers. To adequately apply SNA, an in depth understanding of its core principles and analysis (software) is warranted. We therefore urges future researchers to develop an easy-to-use version of SNA, which can also be used by for instance statistically educated epidemiologists working at the local municipal health services. This would in our opinion be a way to increase the uptake of SNA in IACO process evaluations guided by researchers who do not have the time, resources or knowledge to take up SNA in its current form. In time, this might lead to a better understanding of network development (and its relationship with implementation degree). SNA can also be used to support action research, by for example evaluating network development with community stakeholders using the SNA results. This form of evaluation might then improve collaboration and strengthen network development.

Finally, we would like to suggest some future research pathways. We found that determinants of IACO implementation differed per sector and overtime and that sometimes determinants in interaction seemed to influence implementation success. We however do not yet know if these determinants can be translated into effective implementation strategies.. It is moreover still debated if multi-faceted or single implementation strategies should be formulated to adequately address these (interacting) determinants[29,30]. Research testing implementation strategies targeting the (interacting) determinants identified in this thesis would in our opinion be the next step forward. Summarizing, we therefore advise future studies to further refine if and which (interacting) determinants influence IACO implementation over time and across sectors, how these determinants can then be translated translation into effective IACO implementation strategies, and whether it matters if multi-faceted or single strategies are used. The process of translation of determinants into strategies could be guided by the 'theory informed behavior change' method to implement change as proposed by French *et al.*[109]. This promising method allows for the systematic linkage between pathways of change ((interacting) determinants) to behavior change techniques and their translation to feasible implementation strategies and plans.

Reference list

1. Breitenstein SM, Gross D, Garvey CA, Hill C, Fogg L, Resnick B. Implementation fidelity in community-based interventions. Research in Nursing & Health 2010; 33(2): 164-73.
2. Peters DH, Taghreed A, Olakunle A, Irene AA, Nhan T. Implementation research: what it is and how to do it. BMJ 2013; 347.
3. Rabin BA, Lewis CC, Norton WE, et al. Measurement resources for dissemination and implementation research in health. Implementation Science 2016; 11(1): 1-9.
4. Cook WK. Integrating Research and Action: A Systematic Review of Community-based Participatory Research To Address Health Disparities In Environmental and Occupational Health in the United States. Journal of epidemiology and community health 2008; 62(8): 668-76.
5. Stringer ET. Action research: Sage Publications; 2013.
6. Greenhalgh T, Robert G, Macfarlane F, Bate P, Kyriakidou O. Diffusion of innovations in service organizations: systematic review and recommendations. Milbank Q 2004; 82(4): 581-629.
7. Damschroder LJ, Aron DC, Keith RE, Kirsh SR, Alexander JA, Lowery JC. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. ImplementSci 2009; 4: 50.
8. GROL RPTM, BOSCH MC, HULSCHER MEJL, ECCLES MP, WENSING MICH. Planning and Studying Improvement in Patient Care: The Use of Theoretical Perspectives. Milbank Quarterly 2007; 85(1): 93-138.
9. Fleuren M, Wiefferink K, Paulussen T. Determinants of innovation within health care organizations: Literature review and Delphi study. International Journal for Quality in Health Care 2004; 16(2): 107-23.
10. Hawe P, Shiell A, Riley T. Complex interventions: how "out of control" can a randomised controlled trial be? BMJ : British Medical Journal 2004; 328(7455): 1561-3.
11. Greenwood-Lee J, Hawe P, Nettel-Aguirre A, Shiell A, Marshall DA. Complex intervention modelling should capture the dynamics of adaptation. BMC medical research methodology 2016; 16(1): 1.
12. Hawe P. Lessons from complex interventions to improve health. Annual review of public health 2015; 36: 307-23.
13. Moore GF, Audrey S, Barker M, et al. Process evaluation of complex interventions: Medical Research Council guidance; 2015.
14. Havelock RG. A Comparative Study of the Literature on the Dissemination and Utilization of Scientific Knowledge. 1969.
15. Nutley S, Walter I, Davies HT. From knowing to doing a framework for understanding the evidence-into-practice agenda. Evaluation 2003; 9(2): 125-48.
16. Ang Y, Wee B, Poh B, Ismail M. Multifactorial Influences of Childhood Obesity. Curr Obes Rep

Current Obesity Reports: Current Science Inc.; 2013. p. 10-22.

17. Bemelmans WJ, Wijnhoven TM, Verschuuren M, Breda J. Overview of 71 European community-based initiatives against childhood obesity starting between 2005 and 2011: general characteristics and reported effects. BMC public health 2014; 14(1): 758.
18. Birch LL, Ventura AK. Preventing childhood obesity: what works? IntJObes(Lond) 2009; 33 Suppl 1: S74-S81.
19. Bleich SN, Segal J, Wu Y, Wilson R, Wang Y. Systematic review of community-based childhood obesity prevention studies. Pediatrics 2013: peds. 2013-0886.
20. Han JC, Lawlor DA, Kimm S. Childhood obesity. The Lancet 2010; 375(9727): 1737-48.
21. Waters E, de Silva-Sanigorski A, Hall BJ, et al. Interventions for preventing obesity in children. CochraneDatabaseSystRev 2011; (12): CD001871.
22. Durlak JA. Studying Program Implementation Is Not Easy but It Is Essential. Prevention Science 2015; 16(8): 1123-7.
23. Albrecht L, Archibald M, Arseneau D, Scott SD. Development of a checklist to assess the quality of reporting of knowledge translation interventions using the Workgroup for Intervention Development and Evaluation Research (WIDER) recommendations. Implement Sci 2013; 8: 52.
24. Pierce JL, Kostova T, Dirks KT. Toward a theory of psychological ownership in organizations. Academy of management review 2001; 26(2): 298-310.
25. Inchley J, Muldoon J, Currie C. Becoming a health promoting school: evaluating the process of effective implementation in Scotland. Health Promotion International 2007; 22(1): 65-71.
26. Lee AJ, Bonson A, Yarmirr D, O'Dea K, Mathews JD. Sustainability of a successful health and nutrition program in a remote aboriginal community. The Medical Journal of Australia 1995; 162(12): 632-5.
27. Armbruster C, Gale B, Brady J, Thompson N. Perceived ownership in a community coalition. Public Health Nursing 1999; 16(1): 17-22.
28. Van der Kleij RM, Coster N, Verbiest M, et al. The implementation of intersectoral community approaches targeting childhood obesity: a systematic review. Obes Rev 2015; (in press).
29. Lau R, Stevenson F, Ong BN, et al. Effectiveness of strategies to facilitate uptake or implementation of complex interventions: A systematic review of reviews. Implementation Science 2015; 10(1): 1-2.
30. Harvey G, Kitson A. Translating evidence into healthcare policy and practice: Single versus multi-faceted implementation strategies–is there a simple answer to a complex question? Int J Health Policy Manag 2015; 4(3): 123-6.
31. Davis SM, Sanders SG, FitzGerald C, Keane PC, Canaca GF, VolkerGÇÉRector R. CHILE: An Evidence Based Preschool Intervention for Obesity Prevention in Head Start. Journal of School Health 2013; 83(3): 223-9.
32. Turner KM, Nicholson JM, Sanders MR. The role of practitioner self-efficacy, training, program and workplace factors on the implementation of an evidence-based parenting intervention in primary care. J Prim Prev 2011; 32(2): 95-112.

33. Rohrbach LA, Graham JW, Hansen WB. Diffusion of a school-based substance abuse prevention program: Predictors of program implementation. Prev Med 1993; 22(2): 237-60.

34. Fleuren MA, van Dommelen P, Dunnink T. A systematic approach to implementing and evaluating clinical guidelines: The results of fifteen years of Preventive Child Health Care guidelines in the Netherlands. Soc Sci Med 2015; 136: 35-43.

35. Bandura A. Self-efficacy: toward a unifying theory of behavioral change. Psychol Rev 1977; 84(2): 191.

36. Ajzen I. The theory of planned behavior. Organ Behav Hum Decis Process 1991; 50(2): 179-211.

37. Qiu M, Hu B, Xu Z, Li Y. Employees' psychological ownership and self-efficacy as mediators between performance appraisal purpose and proactive behavior. Social Behavior and Personality: an international journal 2015; 43(7): 1101-9.

38. Rogers EM. Diffusion of innovations. Fourth edition ed. New York: The Free Press; 2003.

39. Young DR, Steckler A, Cohen S, et al. Process evaluation results from a school-and community-linked intervention: the Trial of Activity for Adolescent Girls (TAAG). Health Education Research 2008; 23(6): 976-86.

40. Dusenbury L, Brannigan R, Falco M, Hansen WB. A review of research on fidelity of implementation: implications for drug abuse prevention in school settings. Health EducRes 2003; 18(2): 237-56.

41. Schutte L, Meertens RM, Mevissen FEF, Schaalma H, Meijer S, Kok G. Long Live Love. The implementation of a school-based sex-education program in the Netherlands. Health Education Research 2014; 29(4): 583-97.

42. Bolton KA, Kremer P, Gibbs L, Swinburn B, Waters E, de Silva A. Expanding a successful community-based obesity prevention approach into new communities: Challenges and achievements. Obesity Research & Clinical Practice 2016; 10(2): 197-206.

43. Goodman RM, Steckler A. A model for the institutionalization of health promotion programs. Family & Community Health 1989; 11(4): 63-78.

44. Urquhart R, Porter GA, Sargeant J, Jackson L, Grunfeld E. Multi-level factors influence the implementation and use of complex innovations in cancer care: a multiple case study of synoptic reporting. Implement Sci 2014; 9: 121.

45. Leonard-Barton D. Implementation as mutual adaptation of technology and organization. Research policy 1988; 17(5): 251-67.

46. Muhammad M, Wallerstein N, Sussman AL, Avila M, Belone L, Duran B. Reflections on researcher identity and power: The Impact of positionality on community based participatory research (CBPR) processes and outcomes. Critical Sociology 2015; 41(7-8): 1045-63.

47. Edvardsson K, Garvare R, Ivarsson A, Eurenius E, Mogren I, Nystr+¦m ME. Sustainable practice change: Professionals' experiences with a multisectoral child health promotion programme in Sweden. BMC health services research 2011; 11(1): 61.

48. Edvardsson K, Ivarsson A, Garvare R, Eurenius E, Lindkvist M, Mogren I. Improving child health promotion practices in multiple sectors: outcomes of the Swedish Salut Programme. BMC Public

Health 2012; 12.

49. Rosecrans AM, Gittelsohn J, Ho LS, Harris SB, Naqshbandi M, Sharma S. Process evaluation of a multi-institutional community-based program for diabetes prevention among First Nations. Health Education Research 2008; 23(2): 272-86.
50. Mathews LB, Moodie MM, Simmons AM, Swinburn BA. The process evaluation of It's Your Move!, an Australian adolescent community-based obesity prevention project. BMC public health 2010; 10(1): 448.
51. Gombosi RL, Olasin RM, Bittle JL. Tioga County Fit for Life: a primary obesity prevention project. Clinical pediatrics 2007; 46(7): 592-600.
52. Waqa G, Moodie M, Schultz J, Swinburn B. Process evaluation of a community-based intervention program: Healthy Youth Healthy Communities, an adolescent obesity prevention project in Fiji. Global health promotion 2013; 20(4): 23-34.
53. Zhou J, Shin SJ, Brass DJ, Choi J, Zhang ZX. Social networks, personal values, and creativity: evidence for curvilinear and interaction effects. Journal of Applied Psychology 2009; 94(6): 1544.
54. Control CfD. Make a difference at your school. 2013.
55. Wiltsey Stirman S, Kimberly J, Cook N, Calloway A, Castro F, Charns M. The sustainability of new programs and innovations: a review of the empirical literature and recommendations for future research. Implementation Science 2012; 7(1): 1-19.
56. Scott J. Social network analysis: Sage; 2012.
57. Lewis JM, Baeza JI, Alexander D. Partnerships in primary care in Australia: Network structure, dynamics and sustainability. Social Science & Medicine 2008; 67(2): 280-91.
58. Pope J, Lewis JM. Improving partnership governance: using a network approach to evaluate partnerships in Victoria. Australian Journal of Public Administration 2008; 67(4): 443-56.
59. Mandell MP. Collaboration through network structures for community building efforts. National civic review 2001; 90(3): 279-88.
60. Borgatti SP, Mehra A, Brass DJ, Labianca G. Network Analysis in the Social Sciences. Science 2009; 323(5916): 892-5.
61. Tschannen-Moran M, McMaster P. Sources of self-efficacy: Four professional development formats and their relationship to self-efficacy and implementation of a new teaching strategy. The Elementary School Journal 2009; 110(2): 228-45.
62. Wang D, Stewart D. The implementation and effectiveness of school-based nutrition promotion programmes using a health-promoting schools approach: a systematic review. Public Health Nutrition 2013; 16(06): 1082-100.
63. Chilton R, Pearson M, Anderson R. Health promotion in schools: a scoping review of systematic reviews. Health Education 2015; 115(3/4): 357-76.
64. Bennett AE, Cunningham C, Johnston Molloy C. An evaluation of factors which can affect the implementation of a health promotion programme under the Schools for Health in Europe framework. Evaluation and Program Planning 2016; 57: 50-4.

65. Christian D, Todd C, Davies H, et al. Community led active schools programme (CLASP) exploring the implementation of health interventions in primary schools: headteachers' perspectives. BMC Public Health 2015; 15(1): 1-11.

66. Mullender-Wijnsma MJ, Hartman E, de Greeff JW, Doolaard S, Bosker RJ, Visscher C. Physically active math and language lessons improve academic achievement: a cluster randomized controlled trial. Pediatrics 2016; 137(3): 1-9.

67. Rasberry CN, Lee SM, Robin L, et al. The association between school-based physical activity, including physical education, and academic performance: a systematic review of the literature. Preventive medicine 2011; 52: S10-S20.

68. Kantomaa MT, Stamatakis E, Kankaanpää A, et al. Physical activity and obesity mediate the association between childhood motor function and adolescents' academic achievement. Proceedings of the National Academy of Sciences 2013; 110(5): 1917-22.

69. Laffont J-J, Martimort D. The theory of incentives: the principal-agent model: Princeton university press; 2009.

70. Powell BJ, Waltz TJ, Chinman MJ, et al. A refined compilation of implementation strategies: results from the Expert Recommendations for Implementing Change (ERIC) project. Implementation Science 2015; 10(1): 1-14.

71. Skinner BF. Science and human behavior: Simon and Schuster; 1953.

72. Robison JL. To reward?... or not to reward?: questioning the wisdom of using external reinforcement in health promotion programs. American Journal of Health Promotion 1998; 13(1): 1-3.

73. Ryan RM, Deci EL. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. American psychologist 2000; 55(1): 68.

74. Van Koperen TM, Jebb SA, Summerbell CD, et al. Characterizing the EPODE logic model: unravelling the past and informing the future. ObesRev 2013; 14(2): 162-70.

75. Borys JM, Le BY, Jebb SA, et al. EPODE approach for childhood obesity prevention: methods, progress and international development. ObesRev 2012; 13(4): 299-315.

76. Malik VS, Willett WC, Hu FB. Global obesity: trends, risk factors and policy implications. Nature Reviews Endocrinology 2013; 9(1): 13-27.

77. Albers L, Coenen-van der Burg I, van der Vlugt I, Bemelmans W. Een impuls voor extra gezondheidsbevordering in het primair onderwijs: wat levert het op? Tijdschrift voor gezondheidswetenschappen 2013; 91(6): 304-8.

78. Levine E, Olander C, Lefebvre C, Cusick P, Biesiadecki L, McGoldrick D. The Team Nutrition pilot study: lessons learned from implementing a comprehensive school-based intervention. Journal of nutrition education and behavior 2002; 34(2): 109-16.

79. Fotu KF, Moodie MM, Mavoa HM, Pomana S, Schultz JT, Swinburn BA. Process evaluation of a community-based adolescent obesity prevention project in Tonga. BMC public health 2011; 11(1): 284.

80. Middleton G, Henderson H, Evans D. Implementing a community-based obesity prevention programme: experiences of stakeholders in the north east of England. Health promotion international 2013: das072.

81. Pate RR, Saunders RP, Ward DS, Felton G, Trost SG, Dowda M. Evaluation of a community-based intervention to promote physical activity in youth: lessons from Active Winners. American Journal of Health Promotion 2003; 17(3): 171-82.

82. Nickerson RS. Confirmation bias: A ubiquitous phenomenon in many guises. Review of general psychology 1998; 2(2): 175.

83. Story MT, Neumark-Stzainer DR, Sherwood NE, et al. Management of child and adolescent obesity: attitudes, barriers, skills, and training needs among health care professionals. Pediatrics 2002; 110(Supplement 1): 210-4.

84. Dreisinger ML, Boland EM, Filler CD, Baker EA, Hessel AS, Brownson RC. Contextual factors influencing readiness for dissemination of obesity prevention programs and policies. Health Education Research 2011.

85. Huberty JL, Dodge T, Peterson K, Balluff M. Activate Omaha: the journey to an active living environment. American journal of preventive medicine 2009; 37(6): S428-S35.

86. Richards Z, Kostadinov I, Jones M, Richard L, Cargo M. Assessing implementation fidelity and adaptation in a community-based childhood obesity prevention intervention. Health Educ Res 2014: cyu053.

87. Netherlands S. Quarterly national accounts; changes 1988 -q1 2014. 2014. http://statline.cbs.nl/StatWeb/publication/?VW=T&DM=SLEN&PA=81171ENG&D1=1&D2=0&D3=100-103,105-108,110-113,115-118,120-123,125-127&HD=131125-1153&LA=EN&HDR=T&STB=G1,G2 (accessed 04-07-2016.

88. Liff R, Wikström E. The problem-avoiding multi professional team—On the need to overcome protective routines. Scandinavian Journal of Management 2015; 31(2): 266-78.

89. Middleton G, Evans AB, Henderson H, Windard D. Collaboration or contestation? A critical evaluation of current capacity building mechanisms in community-based obesity prevention programmes. Capacity Building: Planning, Programs and Prospects: NOVA Science Publishers; 2015.

90. Kraak VI, Kumanyika SK, Story M. The commercial marketing of healthy lifestyles to address the global child and adolescent obesity pandemic: prospects, pitfalls and priorities. Public Health Nutrition 2009; 12(11): 2027-36.

91. Reich MR. Public–private partnerships for public health. Nature medicine 2000; 6(6): 617-20.

92. Huang TT, Yaroch AL. A public-private partnership model for obesity prevention. Prev Chronic Dis 2009; 6(3): A110.

93. Torchia M, Calabrò A, Morner M. Public–private partnerships in the health care sector: A systematic review of the literature. Public Management Review 2015; 17(2): 236-61.

94. Johnston LM, Finegood DT. Cross-sector partnerships and public health: challenges and

opportunities for addressing obesity and noncommunicable diseases through engagement with the private sector. Annual review of public health 2015; 36: 255-71.

95. Minkler M. Community organizing and community building for health: Rutgers University Press; 1997.
96. Craig P, Dieppe P, Macintyre S, Michie S, Nazareth I, Petticrew M. Developing and evaluating complex interventions: the new Medical Research Council guidance. IntJNursStud 2013; 50(5): 587-92.
97. Evans R, Scourfield J, Murphy S. Pragmatic, formative process evaluations of complex interventions and why we need more of them. Journal of epidemiology and community health 2014: jech-2014-204806.
98. Helfrich CD, Weiner BJ, McKinney MM, Minasian L. Determinants of implementation effectiveness: adapting a framework for complex innovations. MedCare ResRev 2007; 64(3): 279-303.
99. Michelle C, Ray F, Andrew H, et al. Framework for design and evaluation of complex interventions to improve health. BMJ 2000; 321.
100. Moore G, Audrey S, Barker M, et al. Process evaluation in complex public health intervention studies: the need for guidance. Journal of Epidemiology and Community Health 2014; 68(2): 101-2.
101. Murray E, Treweek S, Pope C, et al. Normalisation process theory: a framework for developing, evaluating and implementing complex interventions. BMC Medicine 2010; 8(1): 63.
102. Clark T. We're Over-Researched Here!'Exploring Accounts of Research Fatigue within Qualitative Research Engagements. Sociology 2008; 42(5): 953-70.
103. Cleary M, Siegfried N, Escott P, Walter G. Super Research or Super-Researched?: When Enough is Enough…. Issues in mental health nursing 2016; 37(5): 380-2.
104. Palinkas LA, Horwitz SM, Green CA, Wisdom JP, Duan N, Hoagwood K. Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. Administration and Policy in Mental Health and Mental Health Services Research 2013: 1-12.
105. Collier D, Mahoney J. Insights and pitfalls: Selection bias in qualitative research. World Politics 1996; 49(01): 56-91.
106. Green CA, Duan N, Gibbons RD, Hoagwood KE, Palinkas LA, Wisdom JP. Approaches to Mixed Methods Dissemination and Implementation Research: Methods, Strengths, Caveats, and Opportunities. Administration and Policy in Mental Health and Mental Health Services Research 2014: 1-16.
107. Provan KG, Veazie MA, Staten LK, TeufelGÇÉShone NI. The use of network analysis to strengthen community partnerships. Public Administration Review 2005; 65(5): 603-13.
108. Valente TW, Coronges KA, Stevens GD, Cousineau MR. Collaboration and competition in a children's health initiative coalition: A network analysis. Evaluation and Program Planning 2008; 31(4): 392-402.
109. French SD, Green SE, O'Connor DA, et al. Developing theory-informed behaviour change

interventions to implement evidence into practice: a systematic approach using the Theoretical Domains Framework. Implementation Science 2012; 7(1): 1.