

Government-Industry-Academia Alliance: A multi-sectoral collaboration for improved nutrition of children and well-being of mothers

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Abstract

Introduction: Consistent with the Sustainable Development Goal 17 highlighting partnership to achieve development, this study demonstrated the convergence among government, industry and academe in carrying out a nutrition intervention to improve the nutritional status, knowledge, attitude and behaviour of school community (school children and mothers). **Methods:** A school-based intervention study comprising of school lunch feeding and nutrition lessons was conducted. Quasi-experimental design was used in the intervention research. Data were analysed using Stata 12.0. Descriptive statistics were generated using the survey module (svy) of Stata. The food and nutrition intervention mix composed of the government-partner School Feeding Programme (SFP) and the nutrition education campaign. The government-partner SFP involved lunch feeding of 7 to 9 years old students based on the standardised *Pinggang Pinoy*[®] recipes. The government-partner nutrition education component involved teaching of the developed modules to students and their mothers. **Results:** The intervention resulted in improvements in nutritional status, knowledge, attitude and behaviour of students. Investing an average of Php 15.00 or USD 0.29 (as of 2017) in a school feeding programme following the government-partner food and nutrition intervention mix improved nutritional status and shifted the number of underweight children to normal nutritional status by 25.3% after 120 feeding days. This intervention was implemented through a multi-sectoral collaboration during the pre-implementation, implementation, and post-implementation phases of the study. **Conclusion:** Partnerships among stakeholders provided the context towards healthier children as demonstrated by improved nutritional status, knowledge, attitude and behaviour of participants.

Keywords: Filipino school children, multi-sectoral collaboration, nutrition, partnership, school feeding programme

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INTRODUCTION

Goal 17 of the Sustainable Development Goals (SDGs) accentuates the value of partnership to achieve sustainable development. A successful sustainable development agenda requires partnerships between government, the private sector, academe, and civil society. According to the United Nations (UN, 2015), these inclusive partnerships built upon principles, values, a shared vision and goals placing people at the centre, are needed at the global, regional, national, and local levels.

It is increasingly recognised that achieving effective health outcomes requires approaches that extend beyond the provision of health services. As a result, there has been a call for the health sector to work across sectors to effectively address health challenges, a concept referred to as inter-sectoral collaboration (Barr *et al.*, 2008; De Leeuw, 2017). Inter-sectoral collaboration for health has been defined as “a recognised relationship between part or parts of the health sector with parts of another sector which has been formed to take action on an issue to achieve health outcomes (or intermediate health outcomes) in a way that is more effective, efficient or sustainable than could be achieved by the health sector acting alone” (Adeyeye & Ofili, 2010).

Recent studies have described the processes of multi-sector coordination in various countries and identified the challenges and key factors for successful coordination. A five-country study showed that differences in institutional mandates leading to lack of sound coordination mechanisms, and dissent among mid-level actors in formulating and agreeing upon different intervention strategies are common barriers. However, these challenges can be addressed through leadership, defined roles and responsibilities, and individual

and strategic capacity (Pelletier *et al.*, 2012). On the other hand, qualitative institutional study of national policy-making in four Sub-Saharan African countries observed that policies and agencies that have cross-sectoral scope do not usually fit the sectoral pattern of resource allocation, thus the ministries may view themselves as in competition with each other (Benson, 2008). High-level political support and processes that bring together a wide variety of stakeholders (Garrett & Natalicchio, 2011), as well as shared vision, capacity strengthening, joint accountability, and supervision (Ved & Menon, 2012) are critical for multi-sector convergence. However, there are limited literatures on how convergence is made operational to ensure effective service delivery.

Chronic malnutrition, including stunting, is an important example of a global challenge that needs multiple sector partnership. Globally, undernutrition, including vitamin and mineral deficiencies, contributes to about 45% of deaths among children, and impairs healthy development and life-long productivity (WHO, 2018).

In a study by the Department of Science and Technology-Food and Nutrition Research Institute (DOST-FNRI) and Save the Children in 2013, Php 328 billion or 2.84% of the Gross Domestic Product was lost due to child undernutrition, while around Php 1.23 billion was lost due to stunting-related grade level repetition brought about by frequent absenteeism and repetition of subjects (Save the Children, 2016). The joint study of the United Nations Children’s Fund (UNICEF) and the Department of Health—National Nutrition Council (DOH-NNC) using the DOST-FNRI data showed that child stunting, iron deficiency anaemia (IDA), and iodine deficiency disorder (IDD) accounted for the highest economic

losses, which is more than \$3 billion per year (UNICEF, 2017).

Addressing malnutrition requires a strong focus on governance, involving coordinated actions by many actors across sectors and levels of government. This paper aimed to demonstrate how multiple sectors converged to examine the benefits of various strategies in improving the nutrition of 7 to 9 years old children (Grades 2 to 3) and the well-being of their mothers in nine (9) selected schools in the municipalities of Bay and Calauan, Laguna in the Philippines, through the provision of a school-based feeding and nutrition intervention mix.

MATERIALS AND METHODS

This paper was part of a larger mixed-method research on Forging Public, Industry Society Alliance – A Programme United for Healthier Kids, intended to improve the nutrition and well-being of selected school children and nutrition knowledge of their mothers.

The operational framework of the study was based on the Input-Process-Output-Outcome System Approach (Figure 1), highlighting the three-pronged partnership between the Government (DOST-FNRI), Academe (Department of Education), and Industry (Nestle Philippines, Inc.) for the well-being of the School Community (school children and mothers). This three-pronged partnership was based on the Triple Helix Model of University-Industry-Government Relations developed by Henry Etzkowitz & Loet Leydesdorff (1998).

The INPUT consisted of contributions from the main partners such as technical resources from the government partner and logistics from the industry partner. The PROCESS of the system approach centred on the actual implementation of the plan through selected public elementary schools, with the academe

as the third partner, to improve the nutritional status of school children and knowledge in nutrition of mothers. The OUTPUT of the research process consisted of the tangible results of the PROCESS to achieve the OUTCOME, which pertains to the improvement of nutritional status among school children and nutrition knowledge of their mothers in the selected schools.

The approach of the PROCESS (Figure 1) included the translation of the *Pinggang Pinoy*® Kid's Plate into adequate meals, Recipe Development, Nutrition Education Campaign, and Evaluation Research.

The *Pinggang Pinoy*® Kid's Plate is a food plate for children with colour-coded portions representing the different food groups. The plate serves as a guide in achieving adequate and well-balanced meals for school children aged 7-9 years old. It also provides consumers, especially the mothers with simple graphic recommendations showing the proper portions of foods. It uses a food plate model, which is simple and understandable, to convey the concept of eating a variety of foods in the right proportions to meet the body's energy and nutrient needs.

Translation of *Pinggang Pinoy*® into Kid's Plate

The *Pinggang Pinoy*® Kid's Plate was translated into adequate meals for the target group of 7-9 years old. A nutritionally adequate four-week cycle menu was developed, consisting of easy-to-prepare and commonly consumed dishes fit for 7-9 years old. The nutritional adequacy of the four-week cycle menu was computed and cross-checked against the Philippine Dietary Reference Intake for children 7-9 years old. Trial cooking, visualisation, and validation of the actual weight of the food per meal was also done to check on its suitability for a child's consumption.

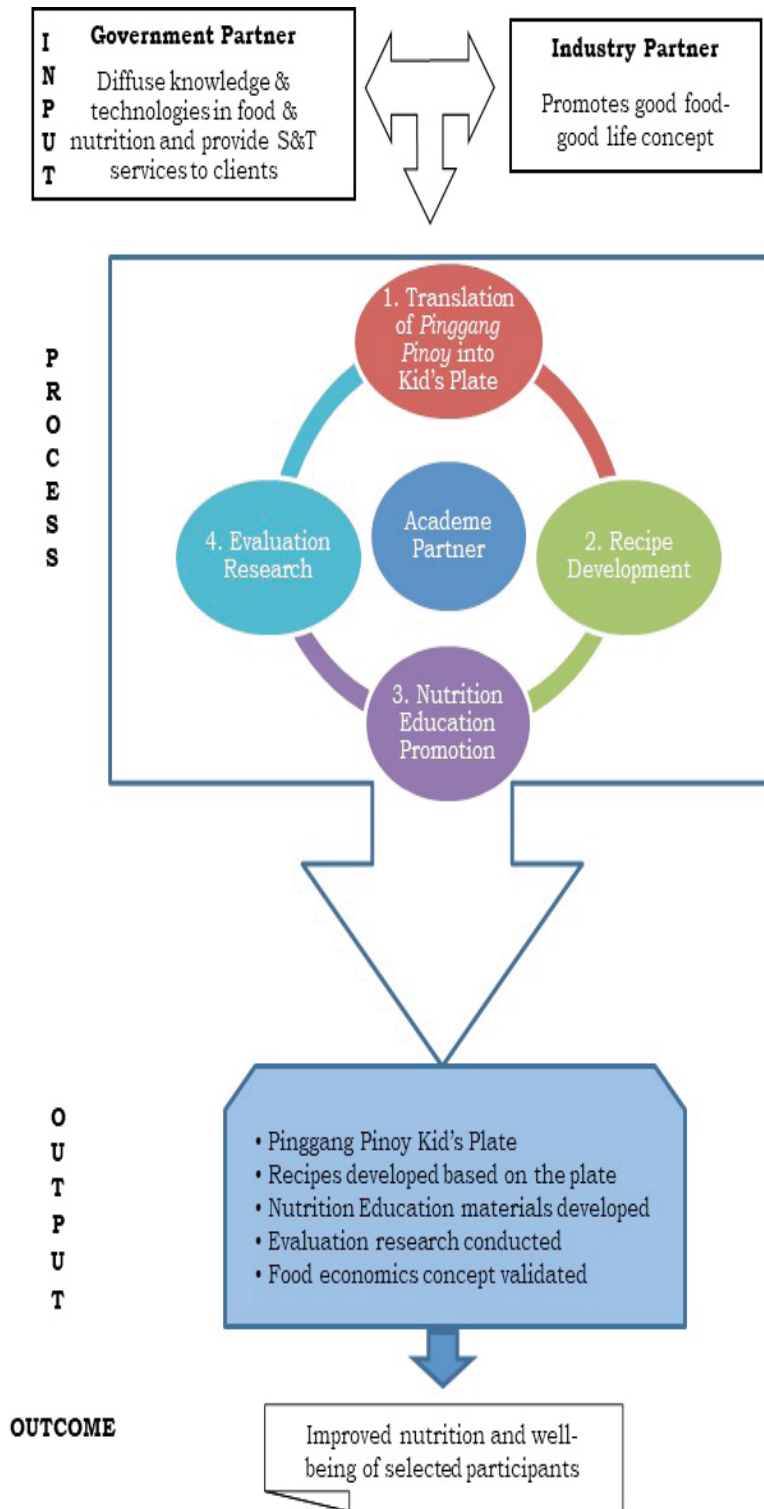


Figure 1. Operational framework of the study

Recipe development

The Recipe Development component of the programme translated the *Pinggang Pinoy*® proportion for 7 to 9 years old school children to nutritious recipes for the School Feeding Programme. Recipes underwent two trials of recipe testing and passed the acceptability test using a nine-point hedonic rating scale. In addition, the recipes were developed within the concept of food economics by optimising the nutritional value of foods to meet a part of the daily energy and protein requirements. It considered the availability, accessibility, taste, cultural acceptability, and affordability by targeting a raw food cost of PHP15.00 per meal (USD 0.29 per meal, as of 2017). A total of twenty (20) meals or twenty-seven (27) recipes were developed and rated acceptable. An assortment of pasta (five), fish (seven), chicken (six), and *tokwa* or soybean curd (two) made up the meals. Each meal consisted of viand, ¾ cup white rice, and one piece banana - *señorita*, a banana variety common in the project area.

Development of nutrition education materials

For the Nutrition Education component, a workshop was held among selected Nutritionist-Dietitians from the government partner and teachers from the academe to develop a comprehensive nutrition education module that was aligned with the Philippines's current K-12 curriculum. A total of five (5) nutrition education modules were developed with key messages on:

- 1) Go, Grow and Glow + Water/ beverage in every plate (*Pinggang Pinoy*);
- 2) Eat fruits and vegetables of varied colours (the colourful plate);
- 3) Consume various kinds of protein sources;
- 4) Consume more nutrient-dense sources of energy; and

- 5) Drink recommended glasses of water and complement it with nutritious beverages.

The developed nutrition education modules for Grades 2 and 3 students were pre-tested among teachers based on the indicators of attractiveness, comprehensibility, acceptability, and self-involvement (ACAS). Likewise, the modules were assessed for sufficiency and adequacy as materials for the conduct of nutrition education classes. Teachers from the selected schools comprising the intervention group also underwent training on "Teaching Nutrition for Healthier Kids".

Evaluation research

The improvement in nutritional status of the school children and their mothers was measured through an Evaluation Research that used the quasi-experimental design. The school children were categorised into four groups: three intervention groups and one non-intervention. The two types of interventions implemented were: 1) School feeding using government partner-developed recipes based on *Pinggang Pinoy*® given during lunch time; and 2) Nutrition education using government partner-developed modules among children and their mothers/caregivers. Three schools were provided with feeding only (Feeding Only group); two schools received nutrition education only (Nutrition Education Only group); two schools were given both types of interventions (Complete Intervention group); and another two schools did not receive any intervention from the government partner (Non-Intervention group), instead they continued with their regular school-based feeding programme (SBFP) implemented by the academe.

For the evaluation component, a total of 385 underweight children and their mothers/caregivers were recruited and

included in the study groups mentioned. The interventions provided to children (feeding and nutrition education) and their mothers/caregivers (nutrition education) were assessed in terms of attaining good nutrition. The schools were assigned to the different groups and received the designated intervention.

The industry partner assisted in the conduct of the School Feeding Programme (SFP) by outsourcing their team members to be in charge of the marketing, preparations, cooking, and distribution of cooked meals for 120 days. The academe partner on the other hand were involved in the implementation of the school-based nutrition education sessions to selected school children and their mothers.

Descriptive statistics, such as means and percentages, were generated using the survey module (svy) of Stata. Data were analysed using Stata Statistical Software: Release 12 (StataCorp LP, College Station, Texas, USA). A written informed consent was obtained from all the participants of this study through their mother or guardian. Ethical clearance and approval prior to project implementation was provided by the FNRI Institutional Ethics Review Committee.

RESULTS

This study demonstrated the collaboration between the government partner, the industry partner, and the academe to improve the nutrition, knowledge, attitude and behaviour (KAB) of 7-9 years old school children and knowledge of their mothers in nine (9) selected schools in Bay and Calauan, Laguna, Philippines through the provision of a school-based food and nutrition intervention mix.

Pre-implementation collaboration

The collaboration among the partners started in the pre-implementation stage with consultations at various levels. Specifically, the consultation with the industry partner was conducted in 2016 for the development of key messages in the nutrition modules, along with the formatting and printing of all nutrition materials. On the other hand, consultations with the academe focused on threshing out concerns in the actual implementation of the nutrition intervention mix.

Translation of Pinggang Pinoy® for kids into adequate meals

Recipe testing showed that the amount of vegetables may not be totally consumed by 7 to 9 years old children based on comments from sensory panelists. Hence, two tablespoons were reduced in the amount of vegetables, without significant effect to the caloric content of the meal.

Recipe development based on the Pinggang Pinoy Kid's Plate

The meals contributed an average of 22% and 36% of the recommended intakes for energy and protein, respectively, for 7 to 9 years old children. The average vitamin A and C contents of the meals were adequate, contributing 81% and 40% of the daily requirements, respectively. On the other hand, the average calcium and iron contents of the meals were below 1/3 of the recommended daily intakes, signifying the need for consumption of milk and other mineral-rich food sources to supplement the meal.

The recipe cost ranged from PHP12.00 (USD 0.23) to PHP15.00 (USD 0.29). Moreover, the original four-week cycle menu (20 meals/27 recipes) was reduced to a three-week cycle menu (15 meals/21

Table 1. Mean scores on knowledge, attitude and behaviour (KAB) of children at baseline and endline

Period	Intervention groups			Non-intervention	p-value
	Feeding only	Nutrition education only	Complete intervention		
Knowledge					
Baseline	14.07±4.49	13.71±4.27	13.59±4.53	14.60±5.21	0.490
Endline	16.90±4.06	16.63±4.13	17.47±5.33	16.71±3.68	0.590
p-value (base-end)	<0.001	<0.001	<0.001	<0.001	
Attitude					
Baseline	64.01±6.65	63.31±7.74 ^a	63.37±7.60 ^b	66.53±6.63 ^{ab}	0.010
Endline	66.54±6.70	64.87±7.73	65.84±8.38	66.17±7.76	0.540
p-value (base-end)	<0.001	0.110	0.050	0.640	
Behaviour					
Baseline	54.96±6.11 ^a	56.42±5.10 ^b	55.69±7.28 ^c	60.07±5.48 ^{abc}	<0.001
Endline	58.25±6.11	56.76±5.72	58.55±4.73	58.98±5.73	0.059
p-value (base-end)	<0.001	0.648	<0.001	0.109	

^{a, b, c} Intervention Groups of the study

^{ab} Mean score of children in Non-intervention is significantly higher than Nutrition education only and Complete intervention (Feeding and Nutrition Education)

^{abc} Mean score of children in Non-intervention is significantly higher than the Intervention Groups

recipes) as seven recipes were excluded from the cycle menu due to difficulty in preparation, cooking, and transporting. In addition, all recipes received high scores with a mean overall liking of 4.3 to 5, which roughly translated to “*medyo gusto*” (like) to “*gustung-gusto*” (like very much).

Recipes that received a perfect hedonic rating of five, such as chicken *afritada*, (a type of Filipino chicken stew with tomato-based sauce, potato, carrots, and bell pepper), fried chicken, chicken spaghetti, and chicken *tinola* (a Filipino soup dish with chicken pieces and vegetables in ginger broth), signified that children preferred dishes that were simpler to prepare and more familiar to them. In contrast, uncommon and newly-introduced recipes such as *tokwa* (tofu) steak, squash soup with *saluyot* (Egyptian spinach), and stir-fried *toge* (mongo sprout) and carrots received the lowest scores.

Nutrition education modules and sessions

School children were exposed to nutrition education topics such as proper nutrition and correct food perceptions through 25-minute sessions totalling to 60 hours, as recommended by Perera *et al.* (2015) to exhibit behavioural change. The nutrition education sessions among Grades 2 and 3 students of the four selected schools lasted for seven months, while nine (9) separate sessions were conducted among mothers and caregivers of these children. Among the exercises and activities in the modules, the easiest and most liked by the students were drawing, colouring, word search, games, singing, and dancing.

Furthermore, the nutrition education modules appeared as very useful aid in teaching proper nutrition and good food habits to school children. Incorporating strategies and materials, such as storytelling, games, and group activities, beyond the conventional lectures were

Table 2. Mean scores on knowledge, attitude and behaviour (KAB) of mothers at baseline and endline

Period	Intervention groups			Non-intervention	p-value
	Feeding only	Nutrition education only	Complete intervention		
Knowledge					
Baseline	31.65±7.14	32.87±5.90	33.11±6.29	32.07±6.95	0.450
Endline	32.88±6.66 ^a	34.04±5.87	35.94±6.63 ^a	33.88±5.79	0.020
p-value (base-end)	0.050	0.020	<0.001	<0.001	
Attitude					
Baseline	105.15±8.94	106.47±7.24	106.00±8.15	105.26±9.54	0.720
Endline	105.12±9.23	106.55±7.71	107.65±8.22	107.12±7.80	0.220
p-value (base-end)	0.960	0.910	0.040	0.060	
Behaviour					
Baseline	87.18±10.17	89.13±8.91	86.33±9.46	88.25±10.23	0.265
Endline	86.43±10.76	86.66±9.22	88.63±9.29	86.47±9.67	0.401
p-value (base-end)	0.476	0.036	0.036	0.071	

^a Mean score of mothers in Complete intervention (Feeding and Nutrition Education) is significantly higher than mean score of mothers in Feeding only

found to be effective in encouraging participation, promoting information and retention of lessons among children.

Implementation

Multi-sector collaboration was evident during the implementation of food and nutrition intervention mix, which was composed of the government partner's SFP and the nutrition education campaign. The school feeding programme involved feeding 7 to 9 years old students with standardised *Pinggang Pinoy*[®] recipes during lunch. On the other hand, the nutrition education component involved the teaching of the government partner's developed nutrition education modules to students and their mothers or caregivers. The industry partner also assisted in managing the provision of school lunch feeding by outsourcing a team who shopped for the needed raw materials, prepared the dishes, and served the food to the school children.

Evaluation of the intervention

The evaluation research conducted by the government partner aimed to document

the effectiveness of the intervention on the nutritional status of the school children and changing behaviour of the children and mothers. Overall, the complete intervention (government partner feeding and nutrition education) had been effective in increasing the KAB scores among children and mothers (Tables 1 and 2).

Children in all study groups had significant improvement in their mean scores on knowledge from baseline to endline, but greater improvement was seen in study groups with nutrition education. In terms of attitude, children in the intervention groups showed increases in their mean scores from baseline to endline, with the Feeding Only group having significant result. Mean scores on behaviour of children in the intervention groups increased from baseline to endline but were only significant in the Feeding Only and Complete Intervention study groups.

Comparing between groups, the mean attitude score of children in the non-intervention group was significantly higher than the Nutrition Education

Table 3. Proportion of underweight school children at baseline and endline

Period	Intervention groups			Non-intervention	p-value
	Feeding only	Nutrition education only	Complete intervention		
Weight-for-age					
Underweight (%)					
Baseline	100.0	100.0	100.0	100.0	-
Endline	83.3	84.3	74.7	76.4	0.300
p-value (base-end)	<0.001	<0.001	<0.001	<0.001	

only and Complete Intervention groups; while the mean behavior score of children in the non-intervention group was significantly higher than all the intervention groups.

At baseline, mothers in the Complete Intervention study group had similar mean scores on knowledge. At endline, the Complete Intervention group obtained the highest mean score among study groups and it was significantly different compared with the Feeding Only group. The mean scores on attitude among mothers increased from baseline to endline; however, only mothers in the Complete Intervention group exhibited significant increases. In terms of behaviour, only mothers in the Complete Intervention group exhibited an increase in mean score from baseline to endline.

Comparing between groups, the mean knowledge score of mothers in the Complete Intervention group was significantly higher than the mean score of mothers in the Feeding Only group. On the other hand, the Complete Intervention group had the highest percentage of children shifting from underweight to normal nutritional status (25.3%) from baseline to endline (Table 3).

DISCUSSION

Multi-sector collaboration may be considered as a process towards achieving higher efficiency, quality, coverage, and effectiveness. According to

FAO (Food and Agricultural Organization) (2013), the fight against hunger can only be won in partnership with the government and other non-state actors, among which they all have fundamental roles to play. In our paper, we focused on the triad partnership as a process in service delivery, with the ultimate vision of a holistic approach to improve the nutrition and well-being of children.

Undernutrition among children was identified as the main nutritional problem at the start of the project. This problem was considered to be further aggravated by challenges in the capacity and capability of mothers and caregivers to take care of their children and provide nutritious meals for the family. The Philippines has taken various actions involving inter-sectoral collaboration in response to these challenges as stipulated under the Philippine Plan of Action for Nutrition 2017-2022 (NNC, 2017).

The partners: government, industry, and academe concurred that improving maternal and child health and nutrition is a shared goal and the joint responsibility of the three sectors. Thus, in a pilot study to demonstrate this shared goal, it was found that a mixed programme of school lunch feeding and nutrition education, led to a considerable higher change in mean weight among child participants. This evidence confirmed the effectiveness of the intervention, only when both school lunch and nutrition education were provided to the children.

As a joint effort and responsibility of the three sectors, several mechanisms were put in place to facilitate regular coordination and collaboration such as monthly and quarterly meetings to update and monitor of the programme activities that were convened by the government partner as the lead programme proponent. Within these different meetings and activities, well-positioned leadership (or champions) have been identified as a key facilitator for convergence. However, there was limited joint planning and coordination due to demands arising from the core sector priorities, particularly that of the academe, where nutrition is not part of the curriculum of elementary school children.

In the present study, strategic alliances forged between the three sectors enabled them to gain competitive advantage through access to partner's resources, including technical matters, technologies, capital and human resources. Team efforts in this study strengthened complementarities in terms of resources and capabilities, enabling participants to grow and expand more quickly and efficiently. In the process, it became time-saving and boosted productivity by not having to develop their own resources from scratch.

The government partner was intended to be the site of planning, training capacity building and supervision; the industry partner through a third party player was the site of support in the implementation of the school-based feeding; while the academe partner was the site of service delivery and support in conducting nutrition education classes and feeding the children. Our findings concur with results from another field study of various sites in India that highlighted needs for nutrition-focused outreach to families and more structured collaboration between health

and nutrition (Bajpai & Dholakia, 2011). Government and private sectors in India, just like in the Philippines, worked toward a common goal to reduce infant mortality, which facilitated coordinated actions and effective programme implementation (Menon *et al.*, 2016). In the present study, coordinated functioning between the three partners may be a result of understanding of their tasks, guided by protocols, advisories, and formal agreements. For example, in the case of the academe partner, head of schools and concerned teachers were oriented and made aware of the responsibilities of each in the delivery and conduct of nutrition education classes to children, while the manpower contracted by the industry partner were guided by the written protocols and food safety regulations in the administration of the school-based feeding among children.

In this study, the three partners valued working together and realised their interdependent roles in delivering the services. However, inadequate or unbalanced incentives (e.g., teachers were not paid for extra effort given in preparing the nutrition education classes) and work roles (e.g., additional load to teachers in integrating nutrition lessons as part of the curriculum, and in ensuring that children will attend the regular feeding sessions) may exhaust or wear them leading to resentment as in the case of several community workers' experiences in integrated service delivery (Mishra, 2014).

Mutual respect, support and understanding of each partner's responsibilities is critical in achieving a shared goal, which in this case, was improving the nutritional status and knowledge of school children and nutrition knowledge of mothers/caregivers. The academe issued clear guidelines and ensured that each teacher was given proper recognition

for the work delivered. Similarly, in the present study, the government partner and academe partner provided the teachers with certificate of appreciation and recognition for their participation in the joint project.

The study can be considered as a concrete example of an application of Goal 17 of the SDGs referring to Partnerships for the Goals. The SDGs can only be realised with a strong commitment to partnership and cooperation. In the present study, without adequate and sustained support from all the partners, the goal of improving the nutritional status and KABs of children and their mothers may not have been achieved.

One of the limitations of this study was that it was conducted in a purposively selected province; therefore, the results was not representative of the entire region. Nevertheless, our study findings may contribute to the growing evidence on multi-sector convergence processes and hold relevance for other countries committed to scaling up nutrition interventions, where coordination has been identified as a major challenge (Gillespie *et al.*, 2013).

CONCLUSION

This paper demonstrated the significance of convergence and partnerships among key stakeholders, such as government, industry, and academe, in facilitating the development, implementation, monitoring, and evaluation of a nutrition intervention to benefit school children and their mothers.

Effective partnership between the public and private sectors rely on various factors for improved multi-sector actions and positive outcomes. The findings of our study highlighted the recognised mandate for convergence for health and nutrition in the form of shared values and guidelines at the agency level, understood and articulated by the leadership in both

sectors. As such, each of the partners in this study had performed specific priority actions, which contributed in the efficient implementation of the nutrition intervention.

This paper confirmed that the *Pinggang Pinoy*[®] can be adopted as the basis for school feeding programmes, and that the Nutrition Education Modules developed for this study can serve as educational materials for teaching about nutrition, food and health among children in Grades 2-3. Based on the results, the intervention that combined the government partner's school lunch feeding and nutrition education sessions would be the most promising option in improving the nutritional status and KAB of students.

The triad partnership between the government, industry and academia could be continuously adopted as an effective approach to improve the nutrition and KAB of selected school children as reflected in the improved weight-for-height z-score and shift in the number of underweight children to normal by 25.3% after 120 feeding days.

Successful convergence and partnership among the government, academia, and the industry can result in a "win-win situation," in which every key player in the programme can benefit. This project provided an example of such cooperation. Challenges during programme implementation have been expected, especially when the project was performed on a voluntary basis. However, once it is sustainable, the programme participants will benefit the most.

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Authors' contributions

Aguila DV, programme coordinator, conceptualised and designed the entire programme together with the programme leader and project team leads, prepared the draft and final manuscript, reviewed the final manuscript before submission to journal and revised the manuscript based on the comments of reviewers; Dorado JB, conceptualised and designed the study, assisted in drafting of the manuscript, reviewed the final manuscript before submission to the journal; Capanzana MV, provided overall guidance and direction in data analysis and interpretation, proofread the manuscript before submission to the journal.

Conflict of interest

This study was funded by Nestle Philippines Inc. The authors declare no potential conflict of interests in the conduct of the study. The funding agency had no role and involvement in the design of the study and collection, analysis and interpretation of data, and in writing the manuscript.

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