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Nutrition governance, good governance for nutrition and nutritional status of children under five years of age in Laguna, Philippines

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ABSTRACT

Introduction: Governance affects nutrition improvement. This study aimed to determine the association between nutrition governance (NG), nutritional status (NS) of children under five years (CU5) and good governance for nutrition (GGN) in Laguna, where malnutrition is a chronic problem. **Methods:** This cross-sectional study obtained data from thirty cities and municipalities (C/M) using desk review and face-to-face interviews. A developed scorecard generated NG and GGN data using 3-point scale with "0" as lowest/absence to "1" indicating partial to "2" as highest/full compliance. Total NG scores was 26 while 38 for GGN. NS was determined using Operation *Timbang* Plus data. Spearman's rank analysis statistically determined the associations between NG, NS, and GGN. **Results:** Underweight and wasting prevalence were low (6.1% and 3.4%) while stunting was high (17.7%). The median percentage scores of C/M on NG and GGN were 73.0%±14.0% and 82.0%±24.0%, respectively. Rosa City and Kalayaan had the highest NG score and the lowest underweight prevalence in urban and rural areas, respectively. Significant but negative associations were found between NG and underweight (r=-0.729, p<0.001), and stunting (r=-0.753, p<0.001). Likewise, GGN and underweight (r=-0.488, p=0.006), and stunting (r=-0.380, p=0.046) showed negative associations. **Conclusion:** C/M in Laguna with higher NG and GGN scores have lower CU5 underweight and stunting prevalence. The study recommended to local governments to invest in establishing separate nutrition unit, hiring technical and administrative staffs, formulating vision and mission, and building capacity on nutrition programme management.

Keywords: Nutrition governance, good governance for nutrition, underweight, stunting

INTRODUCTION

The developmental, economic, social and medical impacts of undernutrition are serious and lasting for countries (WHO, 2016). In 2013, roughly 161 million children under-five years of age (CU5) worldwide were found to be stunted, 99 million underweight and

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51 million wasted. The Philippines ranked 9th among the countries with the highest burden of stunting and 10th with the highest burden of wasting (Save the Children, 2015). A medium magnitude of underweight (19.9%), a high magnitude of stunting (30.3%), and a low magnitude of wasting (7.3%) were reported in the Philippines 8th National Nutrition Survey of Food and Nutrition Research Institute, FNRI (2013).

Child undernutrition is a result of insufficient nutrition intake and frequent infections. It impacts mental function and contributes to poverty by impeding individual's ability to lead productive lives that contributes to the continuing cyclical nature of poverty (UNICEF, WHO and World Bank, 2012). On the other hand, addressing malnutrition has multiple benefits such as preventing more than a third of child deaths per year; increasing gross national product by 11% in Asia; reducing burden of disability for children under-four years old by more than half; increasing school attainment by at least one year; and increasing wage rates by 5% to 50% (Haddad *et al.*, 2013). Both the strong evidences of the damage caused by undernutrition and the multiple benefits in reducing undernutrition led to the emergence of nutrition governance (Gillespie, 2013).

There have been many studies (Gillespie, 2013; Taylor, 2012; Mohmand, 2012; Acosta, 2011; Solon, 2006) and reports (e.g. IFPRI, 2015; WHO, 2013; UNICEF, 2012; WHO, 2009) about nutrition governance. Describing the operation of nutrition governance is important as it is a basic determinant of malnutrition that could influence the underlying and intermediate causes of malnutrition, based on the UNICEF Framework in 1990.

Nutrition governance encompasses processes and institutions, in which stakeholders articulate their interests, exercise their legal rights, meet their obligations, and mediate their differences to serve the needs of the people and solve their nutrition problems. On the other hand, good governance for nutrition entails four key elements such as efficiency, accountability, transparency, and participation that are important for sound plans and implementation of nutrition interventions. These are based on the United Nation Development Programme's (UNDP) definition of governance and World Bank, UNDP, Asia Development Bank (ADB), and Organisation for Economic Co-operation and Development's (OECD) views on good governance, applied in the context of nutrition.

The two concepts differ in terms of their focus areas. Nutrition governance pertains to the processes and institutions of decision-making to solve nutrition problems, while good governance for nutrition focuses on the quality of nutrition service delivery. Both concepts at the city and municipal level have not been thoroughly examined yet in the Philippines

Most of the nutrition governance studies were conducted at the international and national levels. Governance at the local level should also be investigated, since it is through the cities and municipalities by which linkage between the local government and non-government organisations is established. Furthermore, achievement of national nutrition goals may be seen as the interaction of nutrition governance and children's nutritional status at the local level.

This study aimed to determine the association between nutrition governance, nutritional status of CU5 and good governance for nutrition in Laguna. Specifically, the study aimed to describe the prevalence of underweight, stunting, and wasting among CU5 using Operation *Timbang* data; and

detailed the nutrition governance and good governance for nutrition in Laguna using the developed scorecard.

MATERIALS AND METHODS

Research design and sampling procedure

This cross- sectional study was conducted in Laguna, one of the provinces in CALABARZON or Region IV-A. The study covered all its six cities and 24 municipalities. Laguna was selected due to access to the study areas, limited study related to nutrition governance conducted in the past years, and varying capacity of its cities and municipalities to implement nutrition programmes in terms of human, natural, social, and financial resources. These criteria were considered to achieve the feasibility and objectives of the study.

Data collection procedure

The study utilised desk review and survey methods in data gathering. The survey data were used in ranking the cities and municipalities in Laguna based on their nutrition governance and good governance for nutrition scores.

Desk review

According to the Department of the Interior and Local Government (DILG) Guide to comprehensive development plan preparation for local government unit in 2009, cities and municipalities are expected to more effectively manage their own local development with the aid of various plans, such as the comprehensive land use plan (CLUP), city/municipal comprehensive development plan (C/MDP), executive legislative agenda (ELA), and annual investment plan (AIP). The CLUP is a long-term plan embodying programmes, projects and activities (PPAs) for physical development of city or municipality territory. On the other hand, the C/MDP is a 6- or 3-year plan (medium- or short-term) utilised by every city and municipal administration to develop and implement priority sectoral and cross-sectoral PPAs. In order to ensure that CLUP and C/MDP are implemented and monitored, the ELA provides a 3-year development roadmap that is mutually developed and agreed upon by both the executive and legislative departments, based in the context of vision, goals, and objectives of cities and municipalities. The AIP provides the total resource requirements for the budget year, including the detailed annual allocation for PPA (DILG, 2009).

Aligned with the C/MDP, the city/municipal nutrition action plan (C/MNAP) covers a 3-year plan containing the objectives and nutrition interventions that will be implemented to address the malnutrition problem at the city and municipal level. The C/MNAP operationalises the Philippine Plan of Action for Nutrition at the city and municipal level (NNC, 2012). As a basis to formulate the C/MNAP, the Operation *Timbang* (OPT) report provides information on the prevalence of malnutrition among CU5 in cities and municipalities; and aid in identifying underweight, wasted, and stunted CU5 and locating families with malnourished CU5 (NNC, 2012).

These documents provide secondary data related to the socioeconomic and demographic profiles of cities and municipalities, nutrition governance, good governance for nutrition, and nutritional status of CU5 that are used in desk review. the Philippine Standard Geographic Code (PSGC) Interactive of Philippine Statistics Authority, C/MDP, CLUP, ecological profile and OPT report were reviewed to determine the socioeconomic and demographic profile of the province. In order to identify and discuss the type of integration of C/MNAP into other local development

plans, the 2014 C/MNAP, ELA, AIP, C/MDP and CLUP were reviewed.

Local ordinances or resolutions on infant and young child feeding, micronutrient supplementation, food fortification, salt iodisation, food security, and nutrition and infections were reviewed to determine the legal basis of nutrition programmes implemented in the province.

Data on organisational structure were collected from the organisation charts of the city/municipal nutrition committee (C/MNC) to determine the number and composition of membership; as well as the vision and mission statements which may be posted in the bulletin board and/or documented in the C/MNAP. Data on the nutrition resources were obtained from physical evidences of nutrition offices manned with administrative support staff; and 2014 annual investment plan and/or report on the local budget for nutrition to determine fund sources.

Percent coverage of ten nutrition programmes implemented in cities and municipalities were collected from the 2014 accomplishment and documentation reports. The 2014 local budget for nutrition was reviewed to determine the funds released for nutrition. The minutes of the quarterly C/MNC meetings and the accompanying attendance sheets were gathered as well.

The total number of CU5 as well as the prevalence rates of stunting, wasting and underweight among CU5 were collected from the 2014 OPT report. The prevalence rates were classified according to its magnitude or severity based on WHO reference standards (1995).

Survey

Thirty (30) C/MNAOs were interviewed. The C/MNAO is the focal point person on nutrition in city / municipality. Informed consent was requested from the C/MNAOs before the interview. Data gathered during the interview were the socio-demographic profile of C/MNAOs, their understanding of the concept of nutrition governance, the general functions of C/MNCs and the strengths, weaknesses and actions for improvement in each performed function; incentives and rewards for Barangay Nutrition Scholars (BNS); as well as the proposed budget for nutrition by C/MNAOs.

Data collection tools

Two data collection tools were used in the survey, namely, the scorecard and the interview questionnaire. A scorecard was developed to quantify nutrition governance and good governance for nutrition using a scaling technique. The scorecard comprised four sections: 1) nutrition policies and programmes, 2) organisational structure and resources for nutrition, 3) efficiency and 4) accountability, transparency and participation. The first and second sections referred to nutrition governance while the third and fourth sections pertained to good governance for nutrition.

Both primary and secondary data were used as basis for scoring. Primary data were used for the items on functional C/MNCs, ratio of proposed budget for nutrition by C/MNAO to the released budget for nutrition by treasurer, BNS incentives and rewards and conduct of quarterly meetings. A 3-point scale was used, with “0” being the lowest/absence of compliance to “1” indicating partial compliance to “2” being the highest/full compliance. A total score of 26 points was given for nutrition governance, and 38 points for good governance for nutrition. Scores on nutrition governance and good governance for nutrition were classified as high if these were above the median score of cities and municipalities in Laguna, while below the median score was classified as

low. The scorecard was pre-tested in two cities and three municipalities in Cavite. Results of the reliability analysis showed that the Cronbach's alpha coefficient was high at 0.9805 for nutrition governance and 0.9769 for the quality of nutrition governance.

The interview questionnaire consisted of three sections. The first section was on the C/MNAO's profile which includes age, highest educational attainment, profession, position in city/ municipality, represented agency or unit office, type of work as C/MNAO based on time allotment, and length of service as C/MNAO. The second section referred to the C/MNAO's understanding on the concept of nutrition governance and the key elements in determining the quality of nutrition governance. The third section pertained to the operation of nutrition governance which involves strengths, weaknesses, and actions for improvement on each function performed by the C/MNC, BNS incentives and rewards, and practices on accountability, transparency and participation such as the number of times the C/MNC meet, and updating reports.

Data analysis

Descriptive statistics (frequency and percentage distribution, mean, median, standard deviation, and range) were used to analyse the socioeconomic and demographic characteristics of the cities and municipalities, sociodemographic profile of C/MNAOs, nutrition governance and good governance for nutrition scores of cities and municipalities, and nutritional status of CU5.

With the ordinal type of data generated and small-sized population, Spearman's Rank-Order Correlation was used to determine the association between nutrition governance, good governance for nutrition and nutritional status of children under-five year old (CU5) in Laguna. The level of significance was set at 5%.

RESULTS AND DISCUSSION

Socioeconomic and demographic profile of cities and municipalities in Laguna

Laguna covered a total land area of 1,917.85 km^2 as of 2007 based on Land Management Bureau as cited by NSCB (2010). The municipality of Cavinti (203.60 km^2) had the largest land area, while the municipality of Victoria (22.40 km^2) had the smallest land area. Rural areas covered 1,124.32 km^2, larger land area than the urban areas with 793.53 km^2.

Its total population was 2.67 million individuals as of May 1, 2010 based on the 2010 Census of Population and Housing as cited by NSCB (2010). The city with the largest population is Calamba (389,377 persons and 60,562 CU5), while the municipality with the least population is Famy (15,021 persons and 1,283 CU5). According to the Philippine Statistics Authority (2012), Laguna was the third most densely populated province in the country with 1,392 persons per km^2. The most densely populated city was San Pedro (12,238 persons per km^2), and Cavinti (103 persons per km^2) was the least densely populated municipality in the province.

Laguna had an annual income of Php 8.8 billion according to the Commission on Audit (COA) 2011 financial report. Majority (88.70 %) of the provincial's annual income was contributed by the Php 7.8 billion annual income of urban areas. The cities with the highest annual income in Laguna are Calamba (Php 1.9 billion), Sta. Rosa (Php 1.8 billion), and Biñan (Php 1.2 billion). The municipalities of Famy (Php 36 million), Rizal (Php 37 million), and Mabitac (Php 41 million) have the lowest annual income. The main economic sources of

urban areas are commerce and industry with a large percentage of industrial and manufacturing service sectors. On the other hand, the economy in the rural areas is highly dependent on agricultural, fishery and livestock production.

Sociodemographic characteristics of City/Municipal Nutrition Action Officers (C/MNAO)

All C/MNAOs in Laguna were in their middle adulthood stage. The oldest C/MNAO was 64 years old, while the youngest was 32 years old, with a mean age of 54±8 years (Table 1). Among the 30 C/MNAOs in Laguna, the proportion of bachelor's degree graduates was the largest (66.6%), followed by master's degree graduates (20.0%). There were equal proportions (6.7%) of C/MNAOs with doctorate degree units and master's degree/law units. With high level of education, C/MNAOs may have the capability to perform their roles and responsibilities.

The profession of C/MNAOs is classified based on the forty-three professional regulatory board of the Philippine Professional Regulation Commission. Majority (43.4%) of C/MNAOs in Laguna were not licensed nutritionists. Instead, they were Agriculturist (16.7%), Nurse (3.3%), Pharmacist (3.3%), Social worker (3.3%), Veterinarian (3.3%), Forester (3.3%), and Engineer (3.3%). Almost a quarter of the C/MNAOs (23.3%) did not have professional regulatory board because their pursued bachelor or master's degree (e.g. secretariat, home economics, English, and business management) are not included in the standards for board examination of Philippine Professional Regulation Commission.

Majority (66.7%) of the C/MNAOs in Laguna did not hold nutrition officer position in their city/municipality. Instead, they were heads of municipal offices of agriculture (23.3%), social welfare and development (3.3%), as well as planning and development (3.3%). Small percentages of the C/MNAOs were agricultural technologist (6.7%), administrative assistant (3.3%), social welfare officer/day care worker (10.0%), and nurse (3.3%). These C/MNAOs are commonly designated, particularly in rural areas. About 13.4% of them were designated as C/MNAOs without compensation. They worked voluntarily as C/MNAOs because they are close relatives or friends of the Mayor.

Nutrition is not commonly considered a separate department or unit in cities and municipalities. More than half (56.6%) of C/MNAOs in Laguna are working in various departments – agriculture (30.0%), social welfare and development (10.0%), health (10.0%), planning and development (3.3%), and population commission (3.3%).

More than half (53.3%) of C/MNAOs in Laguna work full time as designated C/MNAOs; and 33.3% of them are in the urban areas. In terms of length of service as C/MNAOs, less than half (46.7%) were designated for 1 to 11 years with median average of 16±10 years. The median length in service of designated C/MNAOs in urban areas (22±9) is double the median length in service of designated MNAOs in rural areas (11±10).

Nutritional status of children

Among the three forms of CU5 undernutrition, stunting had the highest median prevalence rate (17.8%); followed by underweight (6.2%) and wasting (4.4%). At the national level, FNRI-DOST (2013) reported similar findings that stunting is the most prevalent form of undernutrition in the Philippines at the rate of 30.3%.

Table 2 presents the ranking of cities and municipalities by nutritional status, and scores of nutrition governance and good governance for nutrition. The

Table 1. Sociodemographic characteristics of City/Municipal Nutrition Action Officers (C/MNAO) in Laguna

Characteristic	*Urban (n=13)*		*Rural (n=17)*		*Overall (n=30)*	
	n	*%*	*n*	*%*	*n*	*%*
Age range, years						
56-65	5	38.5	10	17.6	15	50.0
46-55	8	61.5	4	23.5	12	40.0
≤45	-	-	3	58.9	3	10.0
Mean (number of persons)	54±5		54±9		54±8	
Highest educational attainment						
Bachelor's degree graduate	9	69.2	11	64.7	20	66.6
Master's degree graduate	2	15.4	4	23.5	6	20.0
With master's degree/law units	1	7.7	1	5.9	2	6.7
Doctorate degree graduate	1	7.7	1	5.9	2	6.7
Profession						
Not Nutritionists (Agriculturist, Pharmacist, Nurse, Social worker, Midwife, Veterinarian, Forester, Engineer)	3	23.1	10	58.9	13	43.4
Nutritionists	7	53.8	3	17.6	10	33.3
Do not have Professional Regulatory Board	3	23.1	4	23.5	7	23.3
Position in city/municipality						
Nutrition officer	10	76.9	-	-	10	33.3
Heads of Municipal Agriculture/ Social Welfare/Planning and Development	1	7.7	8	47.1	9	30.0
Others (agriculture technologist, administrative assistant, nurse, social welfare officer/day care worker)	2	15.4	5	29.4	7	23.3
Designated as C/MNAO without compensation	-	-	4	23.5	4	13.4
Represented unit office						
Mayor	7	53.8	6	35.3	13	43.4
Agriculture	2	15.4	7	41.2	9	30.0
Social welfare and development	1	7.7	2	11.8	3	10.0
Health	2	15.4	1	5.9	3	10.0
Planning and development	-	-	1	5.9	1	3.3
Population commission	1	7.7	-	-	1	3.3
Type of appointment						
Full-time C/MNAO	10	76.9	6	35.3	16	53.3
Part-time C/MNAO	3	23.1	11	64.7	14	46.7
Length of service as C/MNAO, years						
1 – 11	4	30.8	10	58.9	14	46.7
12 – 22	5	38.4	4	23.5	9	30.0
23 – 34	4	30.8	3	17.6	7	23.3
Median (number of persons)	22±9		11±10		16±10	

Table 2. Ranking of cities and municipalities in Laguna by children's nutritional status, nutrition governance and good governance for nutrition

Rank	*Nutrition status*[†]			*Nutrition governance*[‡]	*Good governance for nutrition*[‡]
	Underweight	*Stunting*	*Wasting*		
1	Sta. Rosa	Cabuyao	Sta. Rosa	Sta. Rosa Calamba Pila	Kalayaan Pagsanjan
2	Cabuyao	Sta. Rosa	Cabuyao	Kalayaan Cabuyao Pagsanjan	Sta. Rosa Calamba
3	Pagsanjan	Calamba	Calamba	Biñan San Pablo	Biñan San Pablo Pangil
4	Los Baños	Biñan	Los Baños	Bay San Pedro	Cabuyao Pila San Pedro
5	Calamba	Pagsanjan	Rizal	Pangil Victoria	Alaminos Rizal Siniloan
6	Kalayaan	Pila	Santa Maria	Santa Cruz Los Baños Majayjay Nagcarlan	Mabitac Majayjay
7	Biñan	Santa Cruz	Pagsanjan	Alaminos Cavinti Famy Luisiana Lumban Mabitac Pakil Rizal	Victoria
8	Victoria	Los Baños	Biñan	Liliw Magdalena Sta. Maria Siniloan	Santa Cruz Nagcarlan
9	Bay	Rizal	Majayjay	Paete	Cavinti Pakil Bay
10	Pila	Liliw	Santa Cruz	Calauan	Luisina
11	Pakil	Majayjay	Mabitac		Liliw
12	Liliw	Bay	Pakil		Magdalena
13	Santa Cruz	San Pedro	Siniloan		Paete
14	San Pablo	Pangil	Nagcarlan		Lumban
15	Alaminos	Lumban	Lumban		Los Baños
16	Rizal	Nagcarlan	Pila		Famy
17	Majayjay	Cavinti	Cavinti		Santa Maria
18	Luisiana	Siniloan	Pangil		Calauan
19	Sta. Maria	Calauan	Liliw		
20	Lumban	Alaminos	Famy		
21	Nagcarlan	Mabitac	Alaminos		
22	Siniloan	Pakil	Calauan		
23	Cavinti	Santa Maria	San Pedro		
24	Calauan	Famy	Bay		
25	Pangil				
26	Mabitac				
27	Paete				
28	San Pedro				
29	Magdalena				
30	Famy				

[†]Lowest to highest prevalence rate

[‡]Highest to lowest scores

municipality of Famy had the highest prevalence rates of stunting (37.0%) and underweight (15.0%) CU5, while the municipality of Bay had the highest prevalence rate of wasting (10.3%). On the other hand, the city of Sta. Rosa had the lowest prevalence rates of wasting (1.1%) and underweight (1.0%) CU5 while the city of Cabuyao had the lowest prevalence rate of stunting (1.5%) CU5.

Ranking on nutrition governance, good governance for nutrition, and nutritional status

Sta. Rosa, Calamba, Pagsanjan, Cabuyao, and Biñan were among the top cities and municipalities with the highest level of nutrition governance and good governance for nutrition; and with the lowest prevalence of undernutrition.

Sta. Rosa, Calamba, Pagsanjan, Cabuyao, and Biñan had full integration of C/MNAP into their city/municipal plans and agenda, local ordinances on infant and young child feeding, full time C/MNAOs, and fund sources for nutrition action plan. They also had organised city/municipal nutrition committee with local government units (LGU) and NGO member agencies, except for the nutrition committee of Cabuyao which was composed of LGU members only. Except for Pagsanjan, all of them had fully functional nutrition committees; and established a separate nutrition office manned with full time administrative support staffs. Furthermore, all of them reviewed their own vision and mission statements for their C/MNC, except for Biñan.

Sta. Rosa, Calamba, Pagsanjan, Cabuyao, and Biñan had complete coverage of backyard gardening, supplementary feeding, and full immunisation programmes. Majority of them completely covered the target CU5 of vitamin A supplementation, iron supplementation, iodised salt utilisation, nutrition education, and breastfeeding promotion. All of them released 100% of the proposed budget for nutrition; updated and completed reports on nutrition such as accomplishment, documentation, and OPT reports; and conducted quarterly C/MNC meetings with majority of the members attended.

On the other hand, Nagcarlan, Cavinti, Lumban, Famy, and Calauan were among the top cities and municipalities with the lowest level of nutrition governance and good governance for nutrition; and with the highest prevalence of undernutrition.

Nagcarlan, Cavinti, Lumban, Famy, and Calauan did not have local ordinances on infant and young child feeding, and full time C/MNAOs. Except for Nagcarlan, all of them did not have vision and mission statements for nutrition committee; and only had partial integration of C/MNAO into their city/municipal plans and agenda. Excluding Calauan in terms of organisational structure and resources for nutrition, all of them had partially functional nutrition committee; and shared nutrition office with other sector.

Nagcarlan, Cavinti, Lumban, Famy and Calauan released less than the proposed budget for nutrition. Lumban, Famy, and Calauan did not have data on percent coverage of nutrition programmes because their accomplishment reports were not available. Nagcarlan and Cavinti reported incomplete coverage of nutrition programmes among the target CU5 for iron supplementation and vitamin A supplementation. Only Cavinti conducted quarterly C/MNC meetings in 2014 while C/MNC in Lumban met once in 2014. However, majority of the C/MNC members of Cavinti and Lumban did not attend the meeting.

Table 3. Correlation coefficients (*r*) of nutrition governance, good governance for nutrition and nutritional status of children 0-71 months in the cities/municipalities of Laguna

Categories	*Underweight*		*Stunting*		*Wasting*		*Good governance for nutrition*	
	r	*p-value*	*r*	*p-value*	*r*	*p-value*	*r*	*p-value*
Nutrition governance	-0.729	<0.001**	-0.753	<0.001**	-0.369	0.104	0.783	<0.001**
Good governance for nutrition	-0.488	0.006*	-0.380	0.046**	-0.171	0.383	1.000	-

Degree of association (R): 0.8-1, very strong; 0.6-0.79, strong; 0.4-0.59, moderately strong; 0.2-0.39, weak; 0.0-0.19, very weak or no relationship

*Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

Associations between nutrition governance, good governance for nutrition, and nutritional status

The data on nutrition governance, good governance for nutrition and nutritional status passed the two assumptions for the use of Spearman's rho – the two variables are ordinal scale, and a monotonic relationship exist between the two variables. The significant associations among nutrition governance, good governance for nutrition and nutritional status in Laguna are shown in Table 3.

Among the three forms of undernutrition, underweight (r=-0.729, p<0.001) and stunting (r=-0.753, p<0.001) revealed a significant negative association with nutrition governance. Moreover, negative association between good governance for nutrition and underweight (r=-0.488, p=0.006); and negative association between good governance for nutrition and stunting (r=-0.380, p=0.046) were found significant.

The negative association of nutrition governance and good governance for nutrition with stunting and underweight implies that there is a likelihood that lower prevalence of underweight and stunting among CU5 will be achieved as cities and municipalities in Laguna obtained higher scores on nutrition governance and good governance for nutrition. This finding is similar to the study of Sunguya *et al.* (2014) which revealed that strong nutrition governance was associated with lower magnitude of stunting and underweight in low and middle-income countries.

Sunguya *et al.* (2014) further revealed that nutrition policies to address undernutrition are not significantly associated with a reduction in the magnitudes of undernutrition. Having a nutrition policy alone may not be enough to decrease the prevalence rates of undernutrition. Nutrition policies need to be operationalised by streamlining nutrition policies with development agenda and having a nutrition action plan with funds that involve other sectors. In the present study, majority of cities and municipalities that fully integrated their nutrition action plan into other local plans and agenda (e.g. executive legislative agenda, comprehensive development plan, land use plan, and annual investment plan) had low undernutrition prevalence. On the other hand, most of the cities and municipalities which partially integrated their nutrition action plans had high prevalence of undernutrition.

With full integration of nutrition action plan into other local plans and agenda, nutrition is understood as being

at the core of development. The study of Garret and Natalicchio (2011) found that nutrition fails to be integrated into broader development plans and agenda because there is no institution or unit office of nutrition. This supports the finding of the present study that majority of cities and municipalities in Laguna with separate office for nutrition manned by administrative support staff and full time C/MNAOs had full integration of nutrition action plan into other local plans and agenda.

In addition, Sunguya *et al.* (2004) reported that efforts to control undernutrition may not reach the majority of the population and any effort may yield poor outcomes if a nutrition strategy is not streamlined in development agenda. One of the variables of good governance for nutrition is efficiency, which includes percent coverage of nutrition programmes. As revealed in the present study, many cities and municipalities with incomplete coverage in majority of the nutrition programmes had partial integration of nutrition action plan into other local plans and agenda. On the other hand, majority of cities and municipalities with complete coverage in all nutrition programmes had full integration.

CONCLUSION AND RECOMMENDATIONS

Cities and municipalities in Laguna with higher scores on nutrition governance and good governance for nutrition tend to have lower prevalence of underweight and stunting among CU5. The significantly positive associations between nutrition governance and good governance for nutrition revealed that cities and municipalities with higher level of nutrition governance tend to be more efficient, accountable, transparent, and participative. These associations were explained by their type of integration of nutrition action plans into city/municipal development plans and agenda, availability of vision and mission statements of organised city/municipal nutrition committees, and availability of functional city/municipal nutrition committee.

Based on the results, the study recommends to the local government units to provide a separate institution or unit for nutrition manned with full time C/MNAO and administrative staff. This may enable revitalisation of functional city/municipal nutrition committees. In addition, the local nutrition committees should formulate and review their own vision and mission statements to strategically guide the committee in making and prioritising decisions for nutrition service delivery. The city/municipality is also recommended to increase investment on capacity building in nutrition program management at the individual and organisational level. Realising the heavy workload of C/MNAO, allied professionals may be tapped to undertake regular nutrition trainings.

Further investigations that focus on nutrition governance at the barangay level, as the smallest administrative level of the Philippine Local Government System, are also recommended. Other research can use longitudinal study to determine the effect of nutrition governance in the trend of undernutrition at the local level.

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Author's contributions

FLM wrote the manuscript, acquired and analysed data. FLM, TMTM, GNP and QNJV conceptualised and designed the study, and revised the manuscript.

Conflict of interest

All of the authors declared no conflict of interest.

References

Acosta (2011). *In: Analysing Success in the Fight against Malnutrition in Peru. IDS Working Paper Vol. 211 No. 367. Institute of Development Studies.* From https://www.ids.ac.uk/project/analysing-nutrition-governance [Retrieved July 2 2015].

FNRI-DOST (2013). *8th National Nutrition Survey: "Juan Mission for a Well-Nourished Nation" Executive summary from the 2nd National Nutrition Summit.* Manila, Philippines.

Gillespie S (2013). Making nutrition good politics: The power of governance. In M Eggersdorfer, K Kraemer, MT Ruel, M van Ameringen, HK Biesalski, M Bloem, J Chen, A Lateef & V Mannar (eds). *The road to good nutrition: A global perspective* (pp. 111-121). Karger Publishers, Basel, Switzerland.

Haddad L (2013). *In: Child Growth and Sustainable Economic Growth: Why we should invest in Nutrition? A Policy Brief of Children's Investment Fund Foundation and Institute of Development Studies, 2013.* From http://nutrition4growth.org/. [Retrieved March 20 2015].

International Food Policy Research Institute (2015). *Global Nutrition Report: Actions and Accountability to Advance Nutrition and Sustainable Development. A Peer-Reviewed Publication.* International Food Policy Research Institute, Washington D.C.

Mohmand SK (2012). *In: Policies without Politics: Analysis of Nutrition Governance in India. IDS In Focus Policy Briefing Research and Analysis from Institute of Development Studies. Issue February 2012.* From https://www.ids.ac.uk/project/analysing-nutrition-governance. [Retrieved July 2 2015].

National Economic and Development Authority (2013). *Philippine Development Plan 2011-2016.* National Economic and Development Authority, Manila, Philippines.

National Nutrition Council (2012). *Philippine Plan of Action for Nutrition 2011-2016.* Taguig City, Metro Manila. From www.nnc.gov.ph. [Retrieved July 8 2015].

Philippine Statistics Authority (2015). *In: Income classification. National Statistics Coordinating Board.* From http://www.nscb.gov.ph/activestats/psgc/articles/con_urbanrural.asp. [Retrieved July 8 2015].

Provincial Government of Laguna (2014). *Laguna Provincial Nutrition Action Plan.* Provincial Government of Laguna, Laguna, Philippines.

Republic of the Philippines, Congress of the Philippines (2015). *In: R.A. 7160 Local Government Code. Philippine Laws and Jurisprudence Databank.* From www.lawphil.net. [Retrieved July 8 2015].

Solon FS (2006). Good governance for nutrition in the Philippines: Elements, experiences, and lessons learned. *Food and Nutrition Bulletin* 27(4): 343-352.

Sunguya B, Ong K, Dhakal S, Mlunde L, Shibanuma A, Yasuoka J & Jimba M (2014). Strong Nutrition Governance is a Key to Addressing Nutrition Transition in Low and Middle-income Countries: Review of Countries' Nutrition Policies. *Nutrition Journal* 13:65.

Taylor L (2012). *In: A second chance: Focusing Zambia's nutrition sector in the context of political change. Analysis of Nutrition Governance: Zambia Country Report. IDS In Focus Policy Briefing Research and Analysis from Institute of Development Studies. Issue February 2012.* From https://www.ids.ac.uk/project/analysing-nutrition-governance. [Retrieved July 2 2015].

Taylor L (2012*). In: The nutrition agenda in Bangladesh: "Too massive to handle"? Analysis of Nutrition Governance: Bangladesh Country Report. IDS In Focus Policy Briefing Research and Analysis from Institute of Development Studies. Issue February 2012.* From https://www.ids.ac.uk/project/analysing-nutrition-governance. [Retrieved July 2 2015].

UNICEF (2012). *Children in an Urban World. The State of the World's Children 2012 Report.* United Nations Publication, New York.

UNICEF, WHO and the World Bank (2012). *In: Levels & Trends in Child Undernutrition. UNICEF-WHO-The World Bank Joint Child Malnutrition Estimates.* UNICEF, New York; WHO, Geneva; The World Bank, Washington D.C. From http://www.who.int/nutgrowthdb/jme_unicef_who_wb.pdf [Retrieved September 7, 2018]

WHO (2009). *Nutrition Landscape Information System (NLiS) Country Profile Indicators: Interpretation Guide*. WHO Press, Geneva.

WHO (2013). *Global Nutrition Policy Review: What does it take to scale up nutrition action?* WHO Press, Geneva.

WHO (2016). *In: The Double Burden of Malnutrition Policy Brief*. Department of Nutrition for Health and Development, World Health Organization, Geneva. From http://apps.who.int/iris/bitstream/handle/10665/255413/WHO-NMH-NHD-17.3-eng.pdf [Retrieved September 7 2018].