The Philippines’ snapshot situation of pregnancy-related and child feeding practices during the COVID-19 pandemic

Imelda Angeles-Agdeppa, Eva A Goyena and Ma Lynell V Maniego

Abstract

Background: Maternal, infant and young child health and nutrition are affected during the COVID-19 pandemic. Aim: This study aimed to present the snapshot situation of maternal health practices of pregnant women including infant and young child feeding (IYCF) practices of children under two during the COVID-19 pandemic. Methods: A rapid nutrition assessment survey (RNAS) was conducted through phone interview in nine selected areas from November 3 to December 3, 2020. A multi-stage sampling design was employed in the selection of areas with low, medium, and high risk categories across the islands of Luzon, Visayas, and Mindanao in the Philippines. A total of 792 mother-child pairs, and 148 pregnant women were covered. Results: Majority (84.5%) of pregnant women availed prenatal check-ups, 82.4% of them had micronutrient supplements, of which 20.5% took IFA tablets. Almost 60.0% of children under two were currently breastfed during the pandemic, with 60.8% of infants less than 6 months receiving breastmilk exclusively. Appropriate complementary feeding practices based on this study were not drastically affected by the COVID-19 pandemic. However, access to pregnancy-related information, along with breastfeeding and complementary feeding messages and advice were disrupted during the community lockdown. Conclusion: Although maternal and child feeding practices were unchanged, innovative delivery of community health and nutrition services such as tele-visits by midwives, and community health workers are some of the ways to move forward in improving the health and nutrition of women and children in the wake of the pandemic and during subsequent waves.

Keywords
Maternal and child health, maternal health, infant and young child feeding, COVID-19 pandemic, Philippines

Introduction

In March 2020, the World Health Organization (WHO, 2020) declared a global health emergency as a pandemic due to the Corona Virus Disease 2019 (COVID-19). To limit the spread of the virus, the government has imposed strict community quarantine and lockdown measures in all areas of Luzon, Visayas, and Mindanao in the Philippines.

Despite the lockdown and social distancing protocols, the virus has spread tremendously throughout the country. Current evidence points that the pandemic and the measures to control the virus have caused severe economic and social effects on top of the health effects of the transmission of COVID-19 (UNICEF, 2020). The implementation of the community quarantine and lockdown resulted in the closure of many industries (IMF, 2020). As a consequence, about 10.9 million Filipino workers have faced job disruptions through reduced incomes and working hours, or complete job loss (ILO, 2020). The loss of income significantly posed challenges among the Filipino families to access food and optimum nutrition.

Breastfeeding and complementary feeding of young children under two years of age was hypothesized to become more challenging during the COVID-19 pandemic. Many aspects of breastfeeding and complementary support for mothers may be affected particularly on early breastfeeding initiation, receiving continued support in the community for appropriate feeding of young children. The
community lockdown and social distancing policy might have created challenges in accessing maternal health care services and other health information from the health facility. In an effort to ensure continued access to essential health services, the Department of Health (DOH) in April 2020 issued a memorandum providing guidance to local government units on how to manage COVID-19 patients including the provision of maternal health care, organization of healthcare networks, and provision of telemedicine facilities (DOH, 2020). To date, it is unknown to what extent child feeding and women’s access to health services have been affected by the imposed restrictions in the Philippines. From a public health perspective, understanding the evidence on the impact of the pandemic on maternal health care practices including child feeding will allow the intensification of the programs and strategies for the possibility of another outbreak in the future.

This study aimed to present the snapshot situation of maternal health practices of pregnant women as well as infant and young child feeding (IYCF) practices of children under two years of age during the COVID-19 pandemic.

Methods

Study design, survey areas, and participants

The RNAS, a cross-sectional survey, was conducted by the Department of Science and Technology - Food and Nutrition Research Institute (DOST-FNRI) from November 3 to December 3, 2020. The survey was conducted to collect data on 1) food security and coping mechanisms; 2) participation of children and pregnant women on health and nutrition services; and 3) infant and young child feeding practices. However, this study focused on maternal health practices and child feeding practices among the households covered in the survey.

The survey employed a multi-stage sampling technique. First, the areas were selected based on the list of 39 provinces and highly urbanized cities (HUCs) covered in the 2019 Expanded National Nutrition Survey (ENNS). Second, the 2019 ENNS areas were categorized into low-, medium-, and high-risk classification relative to COVID-19 infection. Details of the 2018–2019 ENNS sampling procedure and methodology were described elsewhere (DOST-FNRI, 2020a, 2020b). One province or HUC was selected from each island major group (Luzon, Visayas, and Mindanao) with a total of three provinces/HUCs to represent high, medium, and low-risk areas according to the COVID-19 Inter-Agency Task Force (IATF) categories. However, two areas in the National Capital Region (NCR) were included for the reason that there were no provinces under high risk category in Mindanao. A total of nine (9) provinces/HUCs were selected as study sites of this survey. Third, all households in these selected areas with contact numbers based on the ENNS database were included.

A total of 5943 households with recorded contact numbers were eligible to participate in the survey. However, only 5717 (96.2%) households were covered due to non-functional mobile numbers. This present study was extracted from the dataset of this survey wherein all mothers or caregivers of children 0–23 months old, and also pregnant women from the sampled households were eligible respondents. From the covered households, 148 (2.0%) pregnant women, and 792 dyads of mother and child under two (0–23 months old) were covered.

Prior to the conduct of the survey, coordination letters were sent and meetings were conducted via zoom meet among the various stakeholders in the study areas. The meetings were conducted in two phases: (1) with the provincial DOST directors and provincial nutrition coordinators, and (2) with the local government executives and the municipal nutrition officers. Coordination activities on the ground were done by the municipal nutrition action officers with the village volunteer health and nutrition workers.

Data collection

A phone interview was conducted among pregnant women including mothers or caregivers of children 0–23 months. An electronic data collection system (eDCS) containing maternal and IYCF questionnaires were developed and pre-tested to collect information on maternal health practices, including breastfeeding and complementary feeding practices during the COVID-19 pandemic, respectively. The questionnaires were programmed in the eDCS both in English and Filipino languages. Pregnant women were interviewed regarding their demographic and economic details (maternal age, education, marital status, food security status), and participation to government programs (prenatal care, micronutrient supplementation, food/dietary supplementation, and receipt of nutrition information and education) during the COVID-19 pandemic. Feeding practices were all based on the 24-h food recall. The World Health Organization IYCF (2008) core indicators for breastfeeding among children under 6 months old (exclusive breastfeeding) and for appropriate complementary feeding indicators among children 6–23 months old were assessed using the minimum dietary diversity (MDD), minimum meal frequency (MMF), and minimum acceptable diet (MAD). The MDD refers to the giving of foods to children 6–23 months old from at least four of the seven food groups, namely: grains, roots and tubers, legumes and nuts, dairy products (milk, yogurt, cheese), fresh foods (meat, fish, poultry, and liver/organ meats), eggs, vitamin A-rich fruits and vegetables, and other fruits and vegetables. The MMF refers to the feeding frequency during the previous day, i.e., two times for breastfed infants aged 6–8 months, three times for breastfed children aged 9–23 months, three times for non-b breastfed children aged 6–23 months. The ‘meals’ included major meals and snacks while the frequency was based on the report of the mother. The MAD (categorized as meeting or not
meeting) was determined using both minimum dietary diversity and minimum meal frequency. Probing was done during the interview to collect valid and accurate data. Meanwhile, the household food insecurity was assessed using the Household Food Insecurity Access Scale (HFIAS), which was modified, and pre-tested for its applicability in the Philippine setting during the pilot study of the ENNS (DOST-FNRI, 2020a, 2020b). Based on nine questions regarding difficulties experienced in securing food needs in the past month from the date of the interview and frequency of occurrence, households were categorized into four levels: food secure, mildly, moderately, and severely food insecure.

Since the intention of this study was to provide a snapshot situation of maternal and IYCF practices, the 2019 data from the different provinces/HUCs using the same set of maternal and IYCF indicators were compared with the results of the RNAs. Specifically, complementary feeding practices based on the 2008 WHO-IYCF indicators were compared between the results of the 2020 RNAs (during pandemic) and the 2019 ENNS (before pandemic) with a test of proportion to determine significant change between these periods.

**Ethics approval**

Remote consent of household respondents and individual subjects to participate in the RNAs was obtained by recording the conversation during the process of getting verbal consent from the respondent by the interviewer. A written informed consent form indicating the background and objectives of the survey, the data collection procedures, expected interview duration, possible risks and benefits of participation, confidentiality of information, option to withdraw without penalty or consequences were explained during the recorded phone conversation. All remote consent were filed accordingly in the assigned laptop of each interviewer. All ICFs were collected and filed in a password protected file.

The RNAs survey design was approved by the Technical Committee (TECCOM) and by the Philippines Statistics Authority (PSA) on September 15 and 30, 2020, respectively. It was ethically approved by the DOST-FNRI Ethics Committee (FIERC#2020-013; October 29, 2020).

**Data analysis**

Survey results were analyzed using descriptive statistics using the STATA software version 15 (Corp LLC, Texas, USA). Chi-square for categorical and ANOVA for continuous variables were used to test whether the difference between estimates of breastfeeding, complementary feeding, and maternal health from the RNAs (during COVID-19 pandemic) and that of the estimates from the ENNS 2019 (before pandemic) are statistically significant. A 5% significance level was assumed for all tests.

**Results**

**General characteristics of study participants**

In total, 148 pregnant women, 784 mothers or caregivers, and 792 infants and young children 0–23 months of age were included in the survey (Table 1). The mean ± SD age of the pregnant women, mothers/caregivers, and children 0–23 months old was 27.9 ± 6.1 years old, 31.6 ± 9.1 years old, and 12.3 ± 7.1 months old, respectively. Among pregnant women, the majority were 20 years old and above (87.8%), and were not working (78.4%), while more than half (55.4%) of them were residing in urban areas. Gestational trimester was almost equally represented among pregnant women, of whom 25.7% were in the first gestational trimester, 35.1% in the second trimester, and 39.2% in the third trimester. Almost one-fifth (19.6%) of the pregnant women were reported to be food secure, while 10.1%, 43.9%, and 26.4% belonged to mildly, moderately, and severely food insecure households. Of the mothers/caregivers of children under two, most of them (94.6%) were 20 years old and above. The majority (75.3%) were not working and living in the urban areas (62.9%). Almost one-fourth (23.6%) of the mothers/caregivers were food-secure, while 44.6% and 23.8% were moderately and severely food insecure, respectively. Among the infants and young children, the majority (74.9%) were in the 6–23 months age group. Males and females were almost equally represented at 50.9% and 49.1%, respectively (Table 1).

**Maternal health practices and access to health and nutrition information**

Table 2 shows that the majority (84.5%) of the pregnant respondents had a prenatal check-up. Barangay (village) health center (69.6%) was reported to be the most visited health facility for their prenatal care services, while private hospital or clinic was accessed by 25.6% of pregnant respondents. Of those who did not have a prenatal check-up, their most common reasons were: hindered by fear of contracting COVID-19 (39.1%) at the health facility, were not aware of their current pregnancy (38.4%), and had no time to go to the nearest health facility (13.0%) (data not shown). Most of the pregnant respondents (82.4%) reported that they were currently taking any type of micronutrient supplements, while 14.2% reported that they had never taken any micronutrient supplements during the phone interview. Of those currently taking, 43.4% were taking ferrous sulfate, 30.3% were taking single vitamin/mineral, 27.0% were taking multivitamins, and 20.5% were taking iron-folic acid. Pregnant women who did not take any micronutrient supplements during the pandemic cited the following reasons: no money to buy supplements (28.6%), still waiting for prescriptions from health professionals (28.6%), waiting for a pre-natal check-up (14.3%), and due to mobility restrictions (9.5%) (data not shown).
Almost all (92.6%) pregnant respondents were not recipients of any dietary supplementation programs in the community. Importantly, more than half (57.4%) reported having no access to pregnancy-related information or messages. Of those who had access, almost two-thirds (60.3%) reported receiving health-related pregnancy information from the health center/clinic/health personnel. Similarly, more than half (56.8%) of mothers/caregivers reported having no access to child feeding information or messages. Among those who reported receiving messages, the most common sources of child feeding information were health facilities (61.7%), social media (20.6%), and television (18.3%) as shown in Table 2.

Figure 1 shows the proportion of pregnant women in the RNAS who received prenatal care, took micronutrient supplementation, and took IFA tablets along with pregnant women in the same areas covered in the 2019 ENNS. The figure shows that 84.5% of pregnant women had received prenatal check-ups in the RNAS sample, while 82.7% in the 2019 ENNS, and the difference was not statistically significant ($p > 0.05$). No significant change in the number of pregnant women taking micronutrient supplements before the pandemic based on the 2019 ENNS and during the pandemic based on the RNAS at 78.2% and 82.4%, respectively. The proportion of pregnant women who took iron-folic-acid (IFA) tablets was 20.5% in the sample, while 21.6% before the pandemic based on the 2019 ENNS.

Breastfeeding and complementary feeding

Overall, 59.7% of the infants and young children 0–23 months old respondents were currently breastfed during the time of the survey (Figure 2). Of the breastfed children under 6 months old, 60.8% were currently receiving mother’s milk exclusively during the interview. Results of the assessment of the complementary feeding practices of older children 6–23 months showed that 30.0% were able to meet the minimum dietary diversity of at least 4 of the 7 food groups, while almost all (93.3%) received the minimum meal frequency. Only one-fifth (20.2%) of the children 6–23 months old respondents met the minimum acceptable diet. Comparing the child feeding before and during the COVID-19 pandemic, current breastfeeding of any type, and exclusive breastfeeding did not change ($p = 0.619$; $p = 0.789$, respectively) during the COVID-19 pandemic as shown in Figure 1. Subsequently, the suboptimum complementary feeding practices based on the IYCF indicators (MDD, MMF, and MAD) during the COVID-19 pandemic were not statistically different from the estimates in 2019 prior to the pandemic. On the other hand, 13.9% of the children 0–23 months were stopped breastfeeding, of which 15.1% were under six months old and 13.5% were 6–23.9 months old. Moreover, mothers who stopped breastfeeding during the COVID-19 pandemic reported that

Table 1. Socio-demographic and economic characteristics of study participants: Philippines, 2020.

| Variables                        | n   | Proportion (%) | SD |
|----------------------------------|-----|----------------|----|
| **A. Pregnant Women**            |     |                |    |
| Mean age (years)                 | 148 | 27.9           | 6.1|
| < 20                             | 18  | 12.2           | 11.4|
| ≥20                              | 130 | 87.8           | 30.7|
| Mean gestational age (mos)       | 148 | 5.5            | 2.3|
| First trimester (1–3 mos)        | 38  | 25.7           | 22.2|
| Second trimester (4–6 mos)       | 52  | 35.1           | 28.4|
| Third trimester (7–9 mos)        | 58  | 39.2           | 30.7|
| Working status                   |     |                |    |
| Working                          | 32  | 21.6           | 19.2|
| Not working                      | 116 | 78.4           | 36.6|
| Residence                        |     |                |    |
| Rural                            | 66  | 44.6           | 33.3|
| Urban                            | 82  | 55.4           | 37.1|
| Household food security status    |     |                |    |
| Food Secure                      | 29  | 19.6           | 17.6|
| Mildly food insecure             | 15  | 10.1           | 9.6 |
| Moderately food insecure         | 65  | 43.9           | 33.0|
| Severely food insecure           | 39  | 26.4           | 22.7|
| **B. Mothers and Caregivers of Children** | | | |
| Mean maternal age                | 784 | 31.6           | 9.1 |
| < 20 years                       | 42  | 5.4            | 5.2 |
| 20 years and above               | 742 | 94.6           | 21.9|
| Maternal education               |     |                |    |
| No Grade Completed               | 3   | 0.5            | 0.5 |
| Elementary                       | 97  | 14.9           | 13.8|
| High school                      | 383 | 58.9           | 37.2|
| College and above                | 163 | 25.1           | 21.7|
| Others (Als, SPED)               | 4   | 0.6            | 0.6 |
| Marital status                   |     |                |    |
| Single                           | 83  | 12.8           | 11.8|
| Married                          | 307 | 47.2           | 35.0|
| Live-in                          | 236 | 36.3           | 29.2|
| Widowed                          | 14  | 2.2            | 2.2 |
| Separated                        | 10  | 1.5            | 1.6 |
| Maternal work                    |     |                |    |
| Working                          | 194 | 24.7           | 20.9|
| Not Working                      | 590 | 75.3           | 36.4|
| Residence                        |     |                |    |
| Rural                            | 294 | 37.1           | 29.1|
| Urban                            | 498 | 62.9           | 37.9|
| Household food security status    |     |                |    |
| Food Secure                      | 187 | 23.6           | 20.7|
| Mildly food insecure             | 63  | 8.0            | 7.6 |
| Moderately food insecure         | 353 | 44.6           | 33.2|
| Severely food insecure           | 188 | 23.8           | 20.8|
| **C. Infants and Young Children 0–23 months** | | | |
| Mean age (months)                | 792 | 12.3           | 7.1 |
| 0–5.9                            | 199 | 25.1           | 21.7|
| 6–23                             | 593 | 74.9           | 37.5|
| Sex                              |     |                |    |
| Boys                             | 403 | 50.9           | 35.7|
| Girls                            | 389 | 49.1           | 35.0|

Almost all (92.6%) pregnant respondents were not recipients of any dietary supplementation programs in the community. Importantly, more than half (57.4%) reported having no access to pregnancy-related information or messages. Of those who had access, almost two-thirds (60.3%) reported receiving health-related pregnancy information from the health center/clinic/health personnel. Similarly, more than half (56.8%) of mothers/caregivers reported having no access to child feeding information or messages. Among those who reported receiving messages, the most common sources of child feeding information were health facilities (61.7%), social media (20.6%), and television (18.3%) as shown in Table 2.

Figure 1 shows the proportion of pregnant women in the RNAS who received prenatal care, took micronutrient supplementation, and took IFA tablets along with pregnant women in the same areas covered in the 2019 ENNS. The figure shows that 84.5% of pregnant women had received pre-natal check-ups in the RNAS sample, while 82.7% in the 2019 ENNS, and the difference was not statistically significant ($p > 0.05$). No significant change in the number of pregnant women taking micronutrient supplements before the pandemic based on the 2019 ENNS and during the pandemic based on the RNAS at 78.2% and 82.4%, respectively. The proportion of pregnant women who took iron-folic-acid (IFA) tablets was 20.5% pregnant in the sample, while 21.6% before the pandemic based on the 2019 ENNS.

Breastfeeding and complementary feeding

Overall, 59.7% of the infants and young children 0–23 months old respondents were currently breastfed during the time of the survey (Figure 2). Of the breastfed children under 6 months old, 60.8% were currently receiving mother’s milk exclusively during the interview. Results of the assessment of the complementary feeding practices of older children 6–23 months showed that 30.0% were able to meet the minimum dietary diversity of at least 4 of the 7 food groups, while almost all (93.3%) received the minimum meal frequency. Only one-fifth (20.2%) of the children 6–23 months old respondents met the minimum acceptable diet. Comparing the child feeding before and during the COVID-19 pandemic, current breastfeeding of any type, and exclusive breastfeeding did not change ($p = 0.619$; $p = 0.789$, respectively) during the COVID-19 pandemic as shown in Figure 1. Subsequently, the suboptimum complementary feeding practices based on the IYCF indicators (MDD, MMF, and MAD) during the COVID-19 pandemic were not statistically different from the estimates in 2019 prior to the pandemic. On the other hand, 13.9% of the children 0–23 months were stopped breastfeeding, of which 15.1% were under six months old and 13.5% were 6–23.9 months old. Moreover, mothers who stopped breastfeeding during the COVID-19 pandemic reported that
Taking of micronutrient supplements

| Variables                                | n  | Proportion (%) | 95% CI |
|------------------------------------------|----|---------------|--------|
| A. Pre-natal check-up                    |    |               |        |
| Received pre-natal care                  | 125| 84.5          | 78.6   |
| Did not receive pre-natal care           | 23 | 15.5          | 9.6    |
| Place of pre-natal visit                 |    |               |        |
| Government Hospital                      | 4  | 3.2           | 0.1    |
| Barangay Health Center                   | 87 | 69.6          | 61.5   |
| Private Hospital/Clinic                  | 32 | 25.6          | 18.2   |
| Others (Midwife)                         | 2  | 1.6           | 0.0    |
| Taking of micronutrient supplements      |    |               |        |
| No, had never taken                      | 21 | 14.2          | 8.6    |
| Yes, currently taking (any kind)         | 122| 82.4          | 76.2   |
| Yes, previously but stopped taking       | 5  | 3.4           | 0.5    |
| Type of supplements taken*               |    |               |        |
| Ferrous sulfate                          | 53 | 43.4          | 34.6   |
| Iron-folic acid                          | 25 | 20.5          | 13.1   |
| Folic acid                               | 18 | 14.8          | 8.4    |
| Multivitamins                            | 33 | 27.0          | 19.1   |
| Other single vitamin/mineral             | 37 | 30.3          | 22.1   |
| Calcium Carbonate                        | 30 | 24.6          | 17.0   |
| Receipt of dietary supplementation program |   |               |        |
| Yes                                      | 11 | 7.4           | 3.2    |
| No                                       | 137| 92.6          | 88.4   |
| Access to pregnancy-related information  |    |               |        |
| Yes                                      | 63 | 42.6          | 34.6   |
| No                                       | 85 | 57.4          | 49.4   |
| Sources of pregnancy-related information*|    |               |        |
| Website                                  | 3  | 4.8           | 0.0    |
| Radio                                    | 3  | 4.8           | 0.0    |
| Television                               | 11 | 17.5          | 16.1   |
| Poster, leaflet, flyer, newspaper, or any printed media | 9 | 14.3 | 5.6 |
| Social media                             | 9  | 14.3          | 5.6    |
| Center/clinic thru nurses and midwives   | 38 | 60.3          | 48.1   |
| Relatives                                | 1  | 1.6           | 0.0    |
| B. Mothers and caregivers (n = 784)      |    |               |        |
| Access to child feeding information      |    |               |        |
| Yes                                      | 339| 43.2          | 39.7   |
| No                                       | 446| 56.8          | 53.3   |
| Sources of breastfeeding and complementary feeding information* | | |        |
| Website                                  | 14 | 4.1           | 0.0    |
| Radio                                    | 20 | 5.9           | 3.4    |
| Television                               | 62 | 18.3          | 14.2   |
| Poster, flyer, newspaper, or any printed media | 35 | 10.3 | 7.1 |
| Social Media                             | 70 | 20.6          | 16.3   |
| Health facility (clinic, hospital, health center) | 209 | 61.7 | 56.5 |

*Multiple response; Total pregnant women covered (n = 148).

Discussion

The RNAS study aimed to provide a snapshot of the maternal practices among pregnant women, and child feeding practices among breastfeeding mothers or caregivers. Phone interviews were conducted in nine selected areas across Luzon, Visayas, and Mindanao within a one month period from 3 November to 3 December 2020. The early evidence provided by the study indicates that maternal health practices of pregnant women, and infant and young child feeding practices did not drastically change during the COVID-19 pandemic. However, access to health and nutrition messages and information for pregnant women, breastfeeding mothers, and caregivers was a major challenge during the pandemic.

Main findings showed that 84.5% of pregnant women received pre-natal check-ups during the COVID-19 pandemic, while the data obtained in these areas based on the 2019 ENNS was only about 82.7% as shown in Figure 1. This scenario might be due to more time for the pregnant women to go to the health centers, and the fear of untoward events of pregnancy during this critical period. It should be noted that the most utilized health facility was the Barangay (village) health stations staffed by a midwife and barangay health workers. The results also revealed that the number of pregnant women taking micronutrient supplements during the pandemic was 82.4%, while pregnant women taking supplements based on the pre-pandemic data was 78.2%. The DOH guideline further recommends that pregnant women take iron-folic-acid (IFA) tablets with 60 mg of elemental iron and 400 mcg folic acid. Nevertheless, the proportion of pregnant women who took IFA tablets during the pandemic was still low at 20.5%, while 21.6% during the pre-pandemic based on the 2019 ENNS (p > 0.05).

Maternal health information, messages, or advice can help increase awareness and promotion of desired health and nutrition practices during pregnancy, and importantly to overcome adversity and other mental health challenges that can complicate maternal decisions on health-seeking practices (Cicirelli, 2013; Ellingson and Sotirin, 2006). Of the pregnant women interviewed, more than half (57.4%) did not receive pregnancy-related messages or had no
access to any pregnancy-related information. This is of concern given that pregnancy-related information and advice given during mother’s class to educate pregnant women are important for optimum maternal health practices, and consequently to attain the desired pregnancy and birth outcomes. Counseling on healthy lifestyle and breastfeeding, prevention and management of infection, as well as oral health services are part of the DOH maternal, newborn, child health, and nutrition core package of services (DOH, 2011). The limited access to pregnancy-related messages or advice was possible because of the increased burden on health systems and pressure placed on health workers to engage with COVID-19 activities such as general community education or direct engagement with persons diagnosed with COVID-19 (Bhaumik et al., 2020), which might result in less opportunities to educate mothers through the conduct of nutrition counseling or education.

On exclusive breastfeeding, the results showed 60.8% of infants under 6 months received mother’s milk exclusively. This was higher than the 2019 ENNS data on exclusive breastfeeding (52.6%) among children under 6 years old. Moreover, appropriate complementary feeding practices were not affected among the children 6–23 months: 30% were meeting the MDD, 93.3% were meeting the MMF, and 20.2% were meeting the MAD, with no significant change from the 2019 ENNS estimates: 21%, 92.1%, and 10.3% meeting the minimum dietary requirements, respectively. These seemingly steady estimates of breastfeeding and complementary feeding during the COVID-19 pandemic could reflect more time spent by mothers at home, experiencing more frequent support from the partner and/or being able to invest more time in childcare attributed to the lockdown measures or restricted mobility of mothers and caregivers (data not shown). The findings on breastfeeding corroborate with the results of the study in the National Capital Region.
Breastfeeding was stopped

Currently breastfeeding

Reasons for stopped breastfeeding

Common complementary foods consumed

Table 3. Feeding experiences during the lockdown, Philippines 2020 (n = 792).

| Variables                           | n   | %     | SD   | Lower  | Upper  |
|-------------------------------------|-----|-------|------|--------|--------|
| Breastfeeding was stopped           | 110 | 13.9  | 12.8 | 11.5   | 16.3   |
| 0–5.9 months                       | 110 | 13.9  | 12.8 | 11.5   | 16.3   |
| 6–23.9 months                      | 110 | 13.9  | 12.8 | 11.5   | 16.3   |
| Currently breastfeeding             | 473 | 59.7  | 37.7 | 56.3   | 63.1   |
| 0–5.9 months                       | 157 | 78.9  | 23.7 | 75.2   | 82.6   |
| 6–23.9 months                      | 316 | 53.3  | 40.8 | 48.8   | 57.8   |
| Breastfeeding was stopped prior to |      |       |      |        |        |
| pandemic                            | 0–5.9 months | 12 | 6.0  | 3.9   | 3.8   | 8.2   |
| 6–23.9 months                      | 197 | 33.2  | 30.1 | 29.0   | 37.4   |
| Reasons for stopped breastfeeding  |      |       |      |        |        |
| I just decided I didn’t want to    | 68  | 61.8  | 38.3 | 52.7   | 70.9   |
| breastfeed                         |     |       |      |        |        |
| Mother resumed to work             | 17  | 15.5  | 14.3 | 8.7    | 22.3   |
| Child did not want to be breastfed | 10  | 9.1   | 8.7  | 3.7    | 14.5   |
| Child was not satisfied            | 4   | 3.6   | 3.6  | 0.1    | 7.1    |
| with breastmilk                    |     |       |      |        |        |
| Was not able to go home            | 3   | 2.7   | 2.6  | 0.0    | 5.8    |
| due to lockdown                    |     |       |      |        |        |
| Was given free formula milk        | 1   | 0.9   | 0.7  | 0.0    | 2.7    |
| Others                             | 7   | 6.4   | 6.2  | 1.8    | 11.0   |
| Commercial baby food               | 281 | 45.6  | 33.4 | 41.7   | 49.5   |
| Mashed vegetable                   | 120 | 19.5  | 17.3 | 16.4   | 22.6   |
| Porridge                           | 89  | 14.4  | 13.5 | 11.6   | 17.2   |
| Rice                               | 20  | 3.2   | 3.2  | 1.8    | 4.6    |
| Fruits                             | 12  | 1.9   | 1.9  | 0.8    | 3.0    |
| Biscuit/bread                      | 5   | 0.8   | 0.9  | 0.0    | 1.6    |
| Meat                               | 7   | 1.1   | 0.9  | 0.4    | 1.8    |
| Egg                                | 2   | 0.3   | 0.3  | 0.0    | 0.8    |

(NCR) of the Philippines conducted in September 2020, of which 61% of the children under two were currently breastfed during the pandemic (EPRI, 2020), which could support the evidence of this study that COVID-19 did not affect breastfeeding practices among Filipino children. A similar finding was also noted in the UK New Mum Study wherein breastfeeding rates before and during COVID-19 lockdown appeared the same at relatively high rates, and also indicating an increase in the frequency of breastfeeding and increase in the duration of feeds among women who reported breastfeeding (Vazquez-Vazquez et al., 2020). A longitudinal cohort study in the United States reported lower rates of breastfeeding both in hospitals and at home among mother-newborn dyads (Popoñsky et al., 2020).

Conversely, the low proportion of mothers who reported having access to child feeding information may be attributed to the limited access to basic nutrition services as well as the lack of face-to-face consultation because of fear or unavailability (Hull et al., 2020). This is another concern given that the information, messages, or advice on child feeding practices are important for the continued breastfeeding practice until 2 years and even beyond while giving appropriate complementary feeding starting at 6 months of age. In the RNAS findings, it was noted that there was a lower proportion of children in the 6–8 months (71.2%) who were given the timely introduction of complementary feeding as compared to the 84.4% estimates of the 2019 ENNS (data not shown). Perhaps, this could be due to the lack of face-to-face contact for the conduct of counseling on child feeding including nutrition education as routinely done before the COVID-19 pandemic.

Through the rapid nutrition assessment survey using phone interviews, this present study was able to collect snapshot information of pregnancy-related and child feeding practices among the respective pregnant women and mothers or caregivers of children 0–23 months from the nine (9) selected provinces/HUCs of the Philippines within a span of one-month duration. The study was an effort to respond promptly to the urgent questions of the various national and local stakeholders from health and nutrition, research, academe, and policy with regard to the effect of the pandemic on maternal health practices among pregnant women, and access to health and nutrition messages and information, and infant and young child feeding practices. The current findings were informative among national and local stakeholders in the selected areas and other similar settings. However, the results of the study were not intended to reflect the status of all pregnant women and mothers of children under two years old in the Philippines since only households with active phone numbers in the selected areas covered in the 2019 ENNS were included in the survey. Despite the effort of covering as many pregnant women in the sample, a limited number of pregnant women (n = 148) were covered, thus, it may not be adequate to represent the pregnant population at the national level. Lastly, the findings may be different from the results of actual face-to-face surveys particularly in rural areas which do not have any internet or social media access. Thus, cautious interpretation of the results of this study should be taken into consideration where it cannot simply be extended to other countries or settings.

Conclusions

This study has provided evidence from primary data collection through phone interviews of the maternal health practices including feeding practices of children under two during the COVID-19 pandemic in the nine selected areas in the Philippines. The results showed that poor health practices of pregnant women specifically on the micronutrient supplementation and access to pregnancy-related information and messages were evident during the COVID-19
pandemic. Similarly, suboptimum child feeding practices were evident before and during the pandemic. Access to pregnancy-related information, along with breastfeeding and complementary feeding messages and advice was inadequate during the lockdown based on the low proportion of pregnant women and mothers who received breastfeeding messages and advice. Thus, more consideration and innovative delivery of community health and nutrition services such as tele-visits by midwives, and community health workers are some of the ways to move forward in improving the health and nutrition of women and children in the wake of the pandemic and during subsequent waves.

Acknowledgements
The authors thank the participants of this study for their willingness and time to be interviewed online during the COVID-19 pandemic. Great acknowledgment is given to all technical of the Nutritional Assessment and Monitoring Division (NAMD) of the FNRI-DOST for their contribution during the preparation and data collection phases: Charmaine Duante, Ma. Lilibeth Dasco, Chona Patalen, Cristina Malabad, Josie Desnacido, Charina Javier, Glenda Azaña, Maylène Pua Cajucom, Ma. Stephani Parani, James Andrei Justin Sy, Glen Melvin Gironella, Apple Joy Ducay, Cheder Sumanague. Special thanks to the NAMD staff who acted as disbursering officers during data collection: Ma. Belina Nueva España, Juaimina Belen T. Quiogue, Nelisa P. Cortez, Ma. Sheryl C. Velasco, and Nel John dela Cruz. The authors extend their gratitude to all the trained contract of service staff who were involved in the conduct of phone interviews among the participants.

Authors’ contribution
IAA and EAG conceived the research protocol including questions. EAG lead the data collection, MLVM completed data analysis, with IAA overseeing all data collection data management and analysis. All authors contributed to interpretation of the findings. EAG prepared the first draft of the manuscript with input from all authors. All authors read, critically reviewed, edited, and approved the final manuscript.

Availability of data and materials
The RNAS dataset is available at the Nutritional Assessment and Monitoring Division of the Food and Nutrition Research Institute-Department of Science and Technology (FNRI-DOST), Bicutan, Taguig City, Metro Manila.

Declaration of conflicting interests
The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical statement
The study was conducted in accordance with the declaration of Helsinki and the protocol was approved by the FNRI Institutional Ethics Review Committee under the accreditation of the Philippine Health Research Ethics Board.

Funding
The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iDs
Imelda Angeles-Agdeppa https://orcid.org/0000-0001-9132-7399
Eva A Goyena https://orcid.org/0000-0002-2282-5965

References
Bhaumik S, Moola S, Tyagi J, et al. (2020) Community health workers for pandemic response: A rapid evidence synthesis. Accessed on March 8 at https://gh.bmj.com/content/bmjgh/5/6/e002769.full.pdf
Cicirelli V (2013) Sibling Relationships Across the Life Span. Springer Science & Business Media. Accessed March 8, at https://doh.gov.ph/sites/default/files/publications/MNCHNMOPMay4withECJ.pdf.
Department of Health [DOH] (2020) Memorandum on interim guidelines on health care provider networks during the COVID-19 pandemic. Accessed December 20, 2020 at https://reliefweb.int/sites/reliefweb.int/files/resources/200804%20COVID19%20Philippines%20HRP%20August%20Revision.pdf.
Department of Science and Technology-Food and Nutrition Research Institute [DOST-FNRI] (2020a) 2019 Expanded national nutrition survey (ENNS) results: household food security survey. Accessed March 13, 2021. https://enutrition.fnri.dost.gov.ph/presentations/2019ENNS/FoodSecurity.
Department of Science and Technology-Food and Nutrition Research Institute [DOST-FNRI] (2020b) Philippine nutrition facts and figures 2018–2019. Expanded National Nutrition Survey (ENNS). FNRI Bldg., DOST Compound, Gen. Santos Ave., Bicutan, Taguig City, Metro Manila, Philippines.
DOH (2011) Maternal, newborn, child health and nutrition. Accessed March 8, at https://doh.gov.ph/sites/default/files/publications/MNCHNMOMay4withECJ.pdf.
Economic Policy Research Institute [EPRI] (2020) The impact of the COVID-19 crisis on households in the national capital region of the Philippines. Accessed on February 15, 2021 at https://www.unicef.org/philippines/media/2061/file/Finalreport:TheImpactoftheCOVID-19CrisisonHouseholdsinthNationalCapitalRegionofthePhilippines.pdf.
Ellingson LL and Sotirin PJ (2006) Exploring young adults’ perspectives on communication with aunts. Journal of Social and Personal Relationships 23(3): 483–501. Accessed on March 15, 2021 from https://journals.sagepub.com/doi/10.1177/026150720604217
Hull N, Kam L and Gribble K (2020) Providing breastfeeding support during the COVID-19 pandemic: concerns of mothers who contacted the Australian breastfeeding association. MedRxiv: 1–32. doi: 10.1101/2020.07.18.20152256.
International Labor Organization [ILO] (2020) COVID-19 labour market impact in the Philippines: assessment and national policy responses. Accessed on February 10, 2021 at https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---ilo-mania/documents.
International Monetary Fund [IMF] (2020) World economic outlook. https://www.imf.org/external/datamapper/datasets/WEO.
Popoﬁsky S, Noor A, Leavens-Maurer J, et al. (2020) Impact of maternal SARS-CoV-2 detection on breastfeeding due to
infant separation at birth. *J Pediatr*. 64–70. https://doi.org/10.1016/j.jpeds.2020.08.004.S0022-3476(20)30986-0.

United Nations Children’s Fund [UNICEF] (2020) The impact of the COVID-19 crisis on households in the national capital region of the Philippines. Accessed February 10, 2021 at https://www.unicef.org/.

Vazquez-Vazquez S, Dib S, Rougeaux E, et al. (2020) The impact of the COVID-19 lockdown on the experiences and feeding practices of new mothers in the UK: preliminary data from the COVID-19 new mum study.

World Health Organization [WHO] (2008) *Indicators for Assessing Infant and Young Child Feeding Practices Part I: Definition*. Geneva, Switzerland: WHO. ISBN 978-9-24-159666-4. Available online: https://www.who.int/maternal_child_adolescent/documents/9789241596664/en/ (accessed on 29 August 2021).

World Health Organization [WHO] (2020) WHO Director-General’s opening remarks at the Media briefing on COVID-19—11 March 2020. Available online: https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-themedia-briefing-on-covid-19—11-march-2020 (accessed on 8 February 2021).