

UNSKILLED WORKING MOTHERS ARE AT GREATER RISK FOR POOR CHILD PROTEIN INTAKE AND DIETARY DIVERSITY: AN INDONESIAN DHS 2002–2007 ANALYSIS: PO965

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ABSTRACT

Background and objective

Urbanization and economic growth in low-middle income countries has led to an increase in working mothers. In Indonesia, 40% of these working mothers are typically involved in unskilled labor (eg. agricultural and informal workers). They may represent the group of care-takers most vulnerable to engage in poor feeding practices, due to their socioeconomic status and associated working conditions, such as less time for infant food preparation and limited capacity for childcare. In order to appropriately target intervention programs for child feeding, it is important to assess the role of income, education and associated factors on the ability of different types of working mothers to practice appropriate infant feeding.

Method

This study used pooled data from the Indonesia Demographic Health Survey 2002 and 2007 involving 9,320 children under two-years of age (U2). Dietary diversity was compared among non-working and working mothers based on classification of the mothers' occupation: unskilled, skilled labor and professional. Using non-working mothers as the reference group, and adjusting for socioeconomic, mother, partner, child, and dwelling characteristics, the adjusted odds ratio (aOR) was calculated for the association between occupation and dietary diversity practice.

Result

Unskilled labor mother were less likely to meet criteria for minimal dietary diversity (aOR 0.81 CI95% 0.72-0.94), especially in protein-rich animal-derived or dairy foods (aOR 0.79 CI95% 0.63-0.90), meat (aOR 0.86 CI95% 0.78-1.02) and plant protein such as legumes (aOR 0.75 CI95% 0.59-0.82). In contrast, staple foods, vegetables and fruits were similarly provided by non-working and different types of working mothers.

Conclusion

Dietary diversity and feeding of protein-rich foods for U2 children were consistently poor in unskilled working mothers, and could lead to compromised child growth. Targeted policies and interventions are urgently needed, especially given the increasing number of this unskilled group of working mothers.

Keyword: working mother, dietary diversity, Indonesia

INTRODUCTION

Working mother has increased in the last decade. ILO and some countries demographic data reported increased of female employment about 3-6% annually in developing and 1-3% in developed countries.¹⁻³ Young female worker are keep increasing due to economic growth and company need to recruit younger and healthier employee.^{4,5} Equity of development in most nations gave the higher access to woman for achieving higher level of education. Those conditions and urbanization have resulted in more access to woman for occupation from low to higher level.⁴

ILO has categorized occupation types into several groups indicating grades of level in the company, salary, level of education and experience qualified. Occupation comprises of three levels: (1) unskilled labor (agricultural or informal worker), (2) skilled labor and (3) professional.^{4,6} All of occupation sector has involved female worker.⁷ In early 20, most Indonesian woman was only working as informal or unskilled labor. Recently, women already gain position in higher level of occupation like professional (3,5%), manager (2%).^{8,9}

Majority (80%) of the female worker are still in reproductive age. Among them, 50% is still having under-five year children in their household.^{1,6} Working mother are taking care of 30% of under-5 year old children in Indonesia.¹ Many studies found that working mother may alter child care practice especially feeding practice.¹⁰⁻¹⁴ Therefore, thorough elaboration and analysis of working mother's performance in addressing child feeding practice is important.

The most important child feeding practice is in the first five years period when child need it for critical growth and development phase.^{15,16} It consists of exclusive breastfeeding (EBF) and complementary feeding¹⁷. Most of the studies focus on breastfeeding which found working mother as risk factor of lower exclusive breastfeeding practice. They consider the conditions in working place like poor facilitation for breast-pumping, stockpiling and transferring to the house as the factor.^{11-13,18,19}

In contrast, limited studies covered working mother related to feeding practice after 6 month of EBF phase.^{14,20} The challenge of introducing food after transition 6 months of EBF will be more complicated for working mother. Usually child will be easier if mother herself introduce and give complementary feeding to them.^{17,21} Working mother, especially full timer hardly met this ideal condition since limited time to prepare and process food.^{5,22} Mother, family or any caregiver must be skillful, committed and creative to prepare variety of food in giving diversity and adequate amount of nutrition. Lower level of occupation may still have limited prosperity and option in providing educated and skilled child caregiver.^{4,23}

One well accepted approach to measure complementary feeding practice is dietary diversity.^{23,24} It was designed to measure the fulfillment of essential variety of food which is important to gain the need of nutrition. Based on WHO guideline, dietary diversity consist of 7 food group of grain, legumes, diary, meat, egg, vitamin A rich vegetables, and green vegetables with fruits.²⁵

Only few study found that working mother related to poorer dietary diversity and they only comprised occupation as working and non-working mother^{10,14} Therefore, author consider lack of evidence or study which analyze association of working mother specified to the types of occupation (skilled, unskilled and professional workers) related to dietary diversity, especially in developing country like Indonesia. Therefore this study aimed to analyze dietary diversity performance for specific food types and in minimal dietary diversity, and compare them among non-working and types of mother occupation. In order to appropriately target intervention programs for child feeding, it is important to assess the role of income, education and associated factors on the ability of different types of working mothers to practice appropriate child feeding.

METHOD

Data sources

The analysis used Indonesia Demographic and Health Survey (IDHS). The survey aimed to gather information about child mortality, maternal and child health, family planning and reproductive health issues. We pooled data from IDHS 2003-2003 from 30 provinces and IDHS 2007 from 33 provinces²⁶. The analysis used data from Household Questionnaire (HQ)

Primary sampling unit selection used census blocks and continued with stratification method by urban and rural area within each province. Systematic random sampling was used to select census blocks followed by a random selection of twenty-five households. Further details of the sampling design and survey methodology are available in the IDHS 2007 report²⁶

Conceptual framework

Figure 1 presents the framework used in the current analysis. The mother characteristic factors were age, age when marriage, mother education level, and literacy. Mother working characteristic factors were only involving types of occupation: unskilled, skilled and professional workers. Husband characteristic are occupation and education. Children characteristic are child age, child order number and Number of children 5 and under. Household characteristic are wealth index and places of residence: urban or rural.

Dietary Diversity

This study used WHO recommendation in 2007. Based on WHO guideline, dietary diversity consist of 7 food group of grain, legumes, dairy, meat, egg, vitamin A rich vegetables, and green vegetables with fruits. Minimum dietary diversity is the percentage of children 6–23 months of age who received foods from four or more food groups.²⁵ Further in the analysis, we provided the analysis of association to minimally 6 food groups and minimal 3 essential foods: dairy, meat and rich vitamin A food groups

There were only six food groups in the IDHS data instead of seven recommended in the WHO guidelines because eggs and flesh foods were combined as one group. The combined food group of eggs and meat was arbitrarily assigned a weight of two when calculating the dietary diversity index. WHO Guideline stated that dietary diversity measured based on 24 h recall data. There was a difference of previous definition in DHS 2002-03 in which data collected using 7 day food frequency. Therefore, we conducted adjustment of dietary diversity analysis for DHS 2002/03, which only could be analyzed based on 7 day food frequency. Those issues likely to have produced slightly over-optimistic estimates for the minimal dietary diversity index.²⁰

Data analysis

Analyses were confined to the youngest child 6–23 months of age living with the respondent (ever married women aged 15–49 years) with complete information of dietary diversity. The prevalence of dietary diversity for each food groups or in minimal dietary diversity was estimated across different types of occupation across years. Univariate associations were examined by unadjusted odds ratios for all outcome variables: each food group, and minimal dietary diversity.

Multiple logistic regression analysis was used in a stepwise backward regression model to estimate the adjusted odds ratios and 95 % confidence intervals. The regression result allows for identification on ability of working mother types to practice appropriate dietary diversity, along with the role of other factor risks. Only the variables with statistical significance of $p < 0.05$ were retained in the final step of modeling and are presented in the results tables of multivariate analyses. Data analysis was performed using the SPSS 20.

RESULTS

Characteristic of the sample

Totally 26,803 children under-two ages were available in pooled database. Analysis conducted using complete data in both dietary diversity information and factor risks which only available in 4,350 children in DHS 2002-2003 and 4,970 children in DHS 2007, and in total 9,320 children. Across 2 serials of DHS there is no significant different on characteristic of mother (age and education, partner (age and education) and child (number of children, age).

Working mother increased from 37% to 44%. Among working mother, 50% work as skilled labor, while 37% works in agricultural/unskilled labor and other 14% are working as professional/manager. Proportion of mother working increased in skilled labor 8% and in professional 1% from 2002 to 2007 (Table 1).

Dietary Diversity (DD)

Among 6-23 mo children, dietary diversity fulfillment is higher on type 1 (grain, root and tuber) which covered 92% of subjects and then vitamin A rich vegetables (67%). Some food types covered only by less

than 50% like the lowest is dairy product(41%), legumes (42%) and fruit and green vegetables (45%). Most the food type proportion was increasing across two serials of DHS, except grain. Overall dietary diversity score minimal 4 types were accomplished in 63% of children and increased 5% from 2002 to 2007 (

Table 2).

When the proportion of dietary diversity score was divided based on mother occupation type, gap was obviously shown in legumes, dairy product, flesh food, and vegetables (Figure 2). These gaps were consistently found in both DHS 2002 and 2007. Unexpectedly, there was working mother group which their feeding practice was consistently lower than non-working group. Figure 2 show that unskilled labor feeding practice always lower than other groups even non-working group in giving food types: legumes, dairy product, flesh food, vitamin A rich fruit and other vegetables. Therefore, based on summarized minimal 4 types dietary diversity, again unskilled working mother show the lowest proportion of feeding practice.

Determinant of dietary diversity (minimal 4 food group)

Based on multiple logistic regressions, we found that mother occupation was determinant of dietary diversity (minimal 4 types of food) together with mother and husband education, wealth index and child age. Based on the adjusted OR, the strongest determinant is mother and father education and then wealth index. Even though significant in bivariate analysis, factors of urban or rural residence, child order number, and age of mother were considered not significant as determinant after being adjusted with other factors. Using non-working mother as reference, unskilled labor group showed protective risk to good dietary diversity practice. Otherwise, skilled labor showed causal risk to good DD practice. However professional or manager group did not differ with non-working mother (

Table 3).

Types of working mother as determinant of dietary diversity: each food groups and minimal DD

To give better picture of overall DD practice based on non-working and types of working mother, Figure 3 showed adjusted OR to each food group and summarized minimal dietary diversity. OR was adjusted by factor of: mother (age, education), child (child order, age), husband/partner (education), household condition (rural-urban, wealthy index). Using non-working mother as reference, we obtain unskilled worker was significantly less likely (aOR < 1) to give appropriate feeding practice in protein source food such as: legumes, dairy product, slightly significant in flesh food. Unskilled worker was also significantly less likely to give minimal 4 food group compare to non-working and others working mother. Meanwhile skilled and professional worker were significantly more likely to provide dairy and meat product compare to non-working and unskilled worker. Grain, vegetables and fruit, all of mother give same performance of feeding practice.

DISCUSSION

With so many previous studies focusing on association of working mother to exclusive breastfeeding, this is the first report describing dietary diversity feeding practice in Indonesia, detailed in each food groups and elaborated in each specific types of working mother. Working mother often considered highly related to education and social economy status, nevertheless, it has specific characteristic which may alter mother practice in giving appropriate feeding to infant and child. Categorizing working mother to unskilled, skilled, and professional worker may represent specific characteristic of working environment, for example: unskilled mother represent less facilitated and informed related to exclusive breastfeeding program or professional worker may represent flexibility in preparing time for child care during work.

The strength of the study was using pooled data of IDHS 2002 and 2007. IDHS was a nationally representative survey using standardized methods that achieved high individual and household response rates. Using pooled data of two consecutives of IDHS may represent the trend, consistency and better representativeness to the population. The limitation of study was limited coverage to elaborate working specific characteristic like working place (home or away), duration, or payment since those information was only available in the working mothers. Further analysis will be discussed in continuing publication.

Working mother in Indonesia has reached 40% of female population, and more than 75 percent of them are in the reproductive age. Just like trend in other developing countries, this growing number of working mother may take vital responsible to the growth and development of significant number of under five children.

Minimal dietary diversity and limitation in unskilled working mother

Children consumption of protein rich food is very low, not only in animal source (dairy , meat or egg) but also in plant source (legumes). This finding is worsening when comprised to types of working mother, especially in unskilled working mother. Unskilled worker are vital since they represent 40% of working mother in Indonesia. They are usually less educated, get lower payment and but more likely to flexibility in working time adjustment. They are mother in the agricultural or informal sectors which may have limitation in time provision for preparing food, limited caregiver capacity, beside the limitation of knowledge of nutritious and yet still affordable food. Skilled labor or professional are more likely to have facility from company or information related to healthy lifestyle.^{4,27} This group of informal worker are less likely to have an institution or organization of labor which may help them to organize the intervention program. Study with specific approach to unskilled worker communities may be important for further elaboration.

Working mothers and mothers with less education were significantly less likely to give complementary food and to meet dietary diversity ¹⁰. Some study found that the most consistent determinants of inappropriate complementary feeding practices across all countries were the lack of maternal education and lower household wealth. Beside that this unskilled worker certainly has limited exposure to media, and more likely to inadequate antenatal care and lack of post-natal contacts by health workers were among predictors of inappropriate feeding ⁴. Studies in Bolivia, Ecuador, Philippines, and Thailand found adaptive strategy using occupational choice that can be undertaken by household members in urban poor areas to help ensure their access to food. Choice of business is associated with household vulnerability to food insecurity²⁸.

Knowing unskilled worker as the group at risk for providing appropriate child feeding practice, it consequences health policy maker for designing specific intervention which is applicable to tackle all of difficulties which they may have. With all limitation in economy, time, knowledge, facility and access of information in informal, they need specific and effective approach to prevent their children from being malnourished.

CONCLUSION

Dietary diversity and feeding of protein-rich foods for U2 children were consistently poor in unskilled working mothers, and could lead to compromised child growth. Targeted policies and interventions are urgently needed, especially given the increasing number of this unskilled group of working mothers.

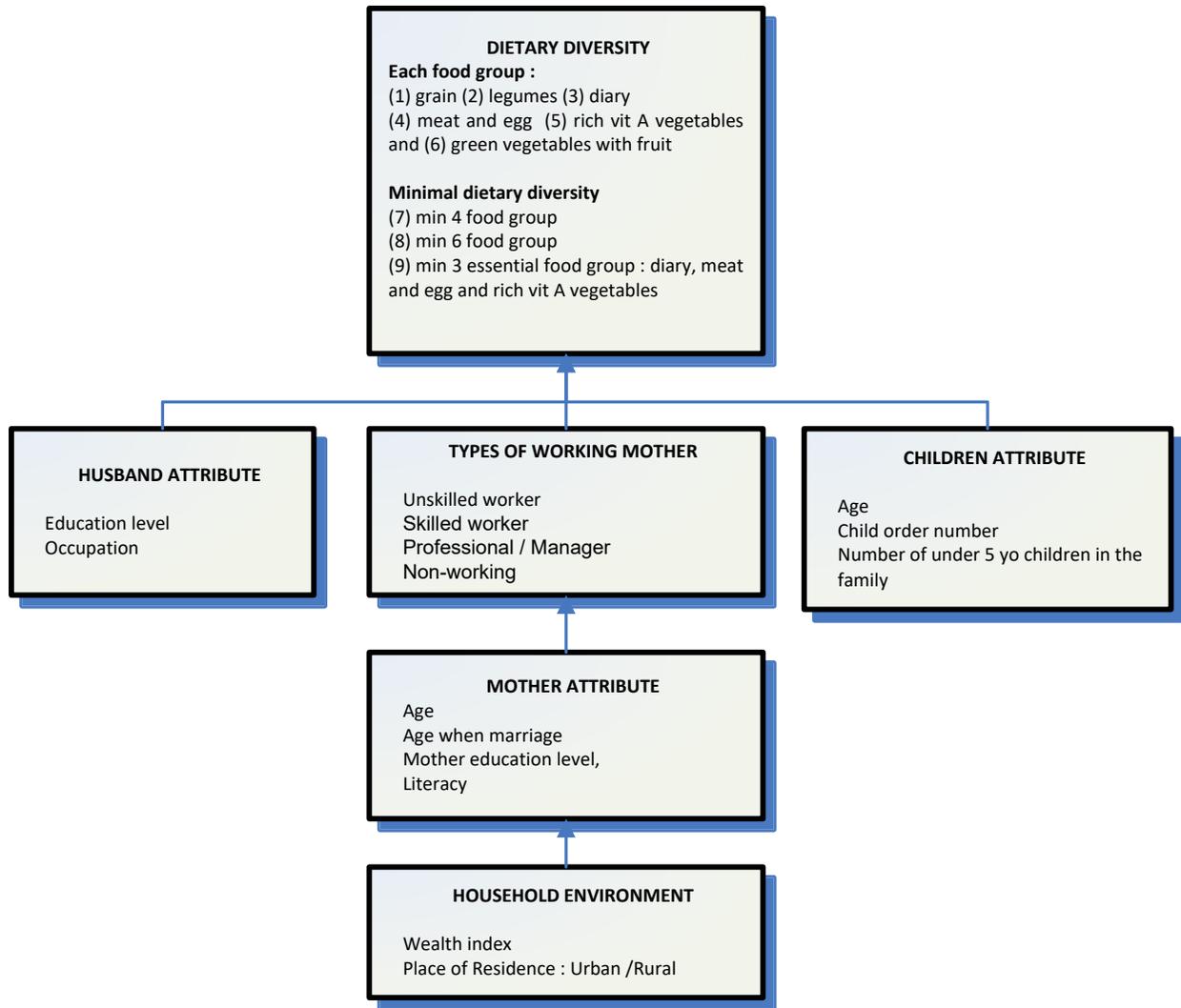


Figure 1. Conceptual Framework for Specific Types of Working Mother related to feeding practice based on dietary diversity.

Table 1. Characteristics of the subject

		Database DHS		
		2002-2003	2007	Total
MOTHER CHARACTERISTIC				
Current age – respondent		28+6	29+6	28+6
Age at first marriage		19+4	20+4	20+4
Educational attainment	No education	4,0%	2,3%	3,1%
	Incomplete primary	14,1%	10,4%	12,1%
	Complete primary	30,3%	28,8%	29,5%
	Incomplete secondary	22,0%	25,8%	24,0%
	Complete secondary	23,0%	24,2%	23,6%
	Higher	6,7%	8,4%	7,6%
Occupation of the mother	do not work	63,4%	56,2%	59,6%
	unskilled labour	15,7%	14,2%	14,9%
	skilled labour	15,8%	23,8%	20,0%
	professional	5,1%	5,8%	5,5%
HUSBAND CHARACTERISTIC				
Partner's educational attainment	No education	3,6%	2,8%	3,1%
	Incomplete primary	12,7%	10,8%	11,7%
	Complete primary	28,5%	26,1%	27,2%
	Incomplete secondary	21,2%	21,3%	21,2%
	Complete secondary	26,4%	30,0%	28,3%
	Higher	7,6%	9,0%	8,3%
Partner's occupation	Did not work	2,2%	2,3%	2,2%
	Professional/ Manager	8,3%	5,6%	6,9%
	Clerical	3,7%	4,0%	3,8%
	Sales	14,1%	14,4%	14,2%
	Agric-self employed	30,9%	31,8%	31,4%
	Services	13,8%	18,8%	16,5%
	Skilled manual	10,4%	22,1%	16,6%
	Unskilled manual	16,7%	1,0%	8,3%
CHILD CHARACTERISTIC				
Child age (month)		14,25+4,98	14,21+5,24	14,23+5,12
Birth order number		2 (1-14)	2 (1-14)	2 (1-14)
Number of children 5 and under years old	0	4,4%	4,1%	4,3%
	1	60,9%	61,4%	61,2%
	2	29,2%	28,6%	28,9%
	≥3	5,6%	5,8%	5,7%
HOUSEHOLD CHARACTERISTIC				
Type of place of residence	Urban	47,1%	41,4%	44,1%
	Rural	52,9%	58,6%	55,9%
Wealth index	Poorest	15,4%	14,2%	14,8%
	Poorer	17,0%	13,8%	15,3%
	Middle	19,7%	17,3%	18,4%
	Richer	27,3%	26,7%	27,0%
	Richest	20,6%	27,9%	24,5%

Table 2. Dietary Diversity practice of children 6-12mo based on DHS 2002/3 and 2007

Food group	Database source					
	2002-2003		2007		Total	
	N	%	N	%	N	%
DD1 grain, root, tuber	3862	92,7%	4390	91,0%	8252	91,8%
DD2 legumes	1670	40,1%	2142	44,5%	3812	42,5%
DD3 dairy product	1571	37,8%	2082	43,5%	3653	40,9%
DD4 flesh food	2433	58,3%	3013	62,4%	5445	60,5%
DD5 vit A rich vegetables	2752	66,0%	3273	67,9%	6025	67,0%
DD6 other fruit vegetables	1745	41,8%	2272	47,1%	4017	44,7%
DD minimum 4	2501	60,4%	3103	65,3%	5603	63,0%
DD minimum 6	1071	25,9%	1557	32,8%	2628	29,6%
DD 3 essential food (flesh food, dairy product, vit A rich vegetables)	888	21,4%	1231	25,8%	2118	23,7%

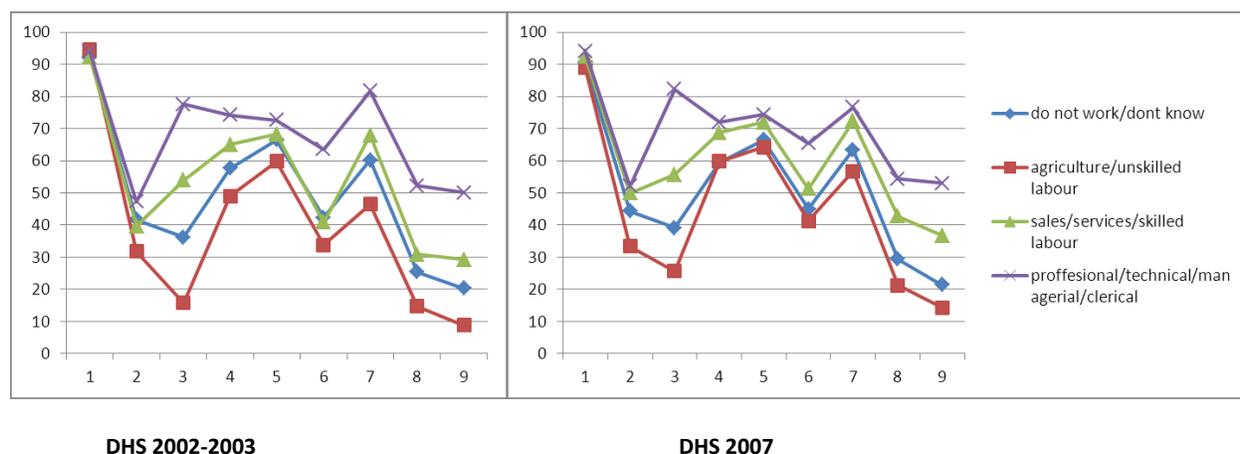


Figure 2. Dietary Diversity Profile in Types of mother occupation.

Dietary Diversity code : (1) grain, root, tuber; (2) legumes; (3)dairy product; (4) flesh food; (5) Vit A rich vegetables; (6) other fruit and vegetables; (7) dietary diversity score minimal 4 types; (8) dietary diversity score minimal 6 types; (9) dietary diversity score for 3 contain of diary, flesh and vit A rich vegetables

Table 3. Factors associated with dietary diversity

		p-value	OR adjusted	95 % CI	
				Lower	Upper
Age of mother		0.739	0.998	0.988	1.009
Mother educational attainment	No education	<0.001			
	Incomplete primary	0.001	1.649	1.218	2.232
	Complete primary	<0.001	2.083	1.545	2.808
	Incomplete secondary	<0.001	2.089	1.533	2.846
	Complete secondary	<0.001	2.679	1.939	3.701
	Higher	<0.001	4.146	2.759	6.232
Mother occupation	do not work	<0.001			
	agriculture/unskilled labour	0.026	0.850	0.737	0.981
	sales/services/skilled labour	<0.001	1.269	1.119	1.440
	Professional/manager	0.304	1.155	0.877	1.521
Partner educational attainment	No education	<0.001			
	Incomplete primary	0.030	1.404	1.034	1.906
	Complete primary	0.006	1.523	1.130	2.053
	Incomplete secondary	0.025	1.420	1.044	1.931
	Complete secondary	<0.001	1.902	1.389	2.603
	Higher	<0.001	2.322	1.588	3.396
Birth order number		0,166	1,022	,991	1,054
Child age		0,000	1,126	1,115	1,137
Wealth Index	Poorest	<0.001			
	Poorer	0.037	1.191	1.011	1.404
	Middle	<0.001	1.429	1.213	1.684
	Richer	<0.001	1.723	1.467	2.025
	Richest	<0.001	1.699	1.422	2.031
Type of place of residence	Urban	0,156	1,081	,971	1,203

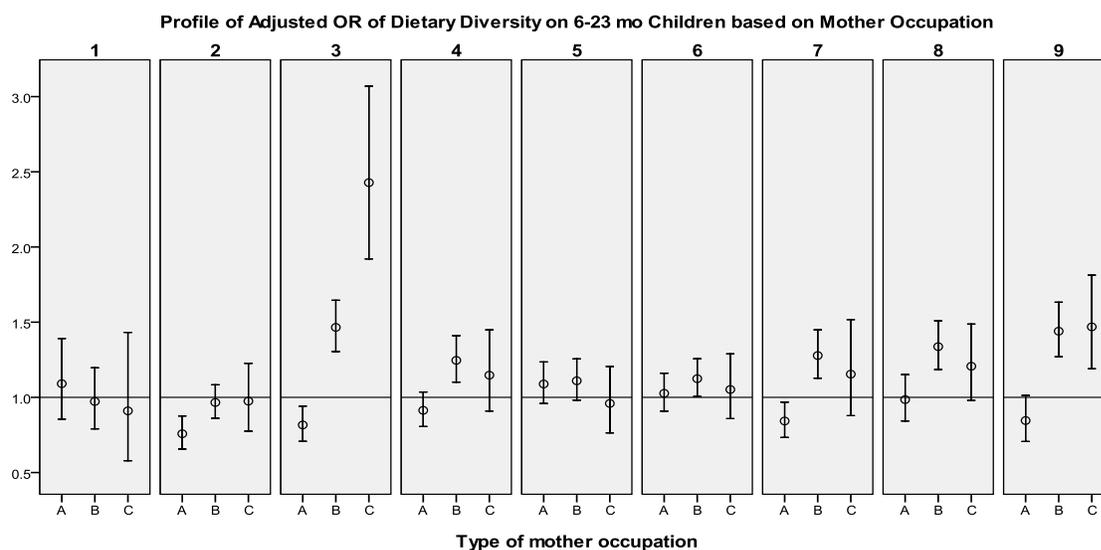


Figure 3. Adjusted OR of Mother Occupation type to Dietary Diversity (types of food & minimal score) of 6-23 mo Children.

Vertical axis showing adjusted OR and 95% CI with reference line =1.

Code ABC means Mother Occupation types (A: unskilled, B: skilled , C: Professional/Manager).

Dietary Diversity number code : (1) grain, root, tuber; (2) legumes; (3)dairy product; (4) flesh food; (5) Vitamin A rich vegetables; (6) other fruit and vegetables; (7) dietary diversity score minimal 4 types; (8) dietary diversity score minimal 6 types; (9) dietary diversity score for 3 contain of dairy, flesh and vitamin A rich vegetables.

OR was adjusted by factor of: mother (age, education), child (child order, age), husband/partner (education), household condition (rural-urban, wealthy index)

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