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The Association of Maternal Employment Status on Nutritional Status among Children in Selected Kindergartens in Selangor, Malaysia

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ABSTRACT

Maternal employment status exerts strong influence over child feeding practices thus it reflects child nutrition status. This study was conducted to investigate the association of maternal employment status on nutritional status among 142 children aged 4-6 years old in selected kindergartens in Selangor, Malaysia. 2 out of 9 kindergartens were located at rural area while the other 7 kindergartens were located at urban area. The nutritional status of the children were assessed using anthropometrical data and diet record. The anthropometrical data were taken and later were compared with the WHO and CDC growth charts. Whereas, the diet record were analyzed and later compared with RNI. Prevalence of severely wasting was higher in unemployed mothers' children (17%) than in employed mothers' children (8%). Overall, energy intake of the boys was higher than recommendation with 101% for employed mothers and 125% for unemployed mothers. Protein intake of the boys were also higher than recommendation in both employed (221%) and unemployed (278%) mothers. There was a positive relationship found between maternal working hours and child's weight ($r = 0.16$, $p < 0.05$) and BMI ($r = 0.21$, $p < 0.05$). While, negative relationship was found between maternal working hours and child's energy ($r = -0.270$, $p < 0.001$), protein ($r = -0.265$, $p < 0.001$) and fat ($r = -0.243$, $p < 0.01$) intake. Nevertheless, no relationship was found between mother's working hours and child's height ($p = 0.745$), calcium ($p = 0.523$) and iron ($p = 0.219$) intake. It is clearly proven that maternal employment status plays an essential role in determining child feeding practices which may influence child's health and development in later life.

Key words: Maternal employment, pre-school children, nutritional status

INTRODUCTION

In this modern era, most mothers have become part of the labor force compared to previous time. Maternal employment influence child feeding practices thus it reflects child nutrition status. Mothers exert strong influence over child feeding practices. This has been proven by a study done by Johannsen *et al.* (2006) which stated that child's weight was found to be closely related to mother's BMI but not father's. Feeding practices play a vital role in determining child health and food preferences in later life. Better child nutritional status was also associated with better educational achievement among children in Malaysia (Shariff *et al.*, 2000). A study done

by Miller and Han (2008) claimed that, mothers with irregular working shifts will have disruption in meal preparation and activity routines. The study also reported that child's BMI increased significantly if their mothers worked at irregular schedule. Thus, children of employed mothers were more likely to have poor dietary habits and spent more time engaging in sedentary activity compared to children of unemployed mothers (Hawkins *et al.*, 2009).

Number of studies found, there were a link between childhood obesity and mothers who work. Most studies showed higher prevalence of childhood obesity were among employed mothers compared to unemployed mothers. This was supported by a study done by Araneo (2008) who revealed that full-time employment mothers had higher probability of the child being overweight. Whereas, Morrissey *et al.* (2011) claimed that increased length of working hours were found to be associated with an increase in their child's BMI.

Nevertheless, the findings were contradicted with the findings by Fertig *et al.* (2009) which claimed there was some evidence that mother's working hours were associated with lower BMI in child because child spent more time in school or in child care. Similarly, a cross-sectional study found full-time employed mother had no relation with child's BMI (Taylor *et al.*, 2011). This study showed that children who were overweight/obese, were more likely to spent more time on screened-based activity, spent no time on studying and sleep less than 10 h per night, thus leading to overweight/obese among them.

A study conducted among Malaysian women aged between 25-35 years found that majority of working mothers had stopped breastfeeding less than three months. In addition to this, Chinese and Indian mothers have higher risk of discontinuing breastfeeding compared to Malay mothers (Amin *et al.*, 2011). This might be caused by inadequate breastfeeding facilities provided at workplace. This finding was also being supported in a study by Hawkins *et al.* (2007) which stated that the longer the length of mother's working hours, the less likely the mothers breastfed their children for at least 4 months. Working mothers were less likely to initiated and continue breastfeeding as they prefer infant formula (Grzywacz *et al.*, 2010). In addition to that, a study done in Saudi Arabia found that, older mothers tended to practice exclusive breastfeeding more than younger mothers (Ahmed Al-Shoshan, 2007). In contrast, the prevalence of exclusive breastfeeding significantly decreased with increase of mother's age (Vafaei *et al.*, 2010).

According to Agostoni *et al.* (2008), early introduction of cow's milk would cause iron deficiency in infants as cow's milk is known to be poor source of iron. Abidoye *et al.* (2000) stated that, stunted and wasted characterize different process of malnutrition stemmed from feeding and weaning practices. The study also revealed that, growth pattern in early age is the foundation for future growth. In addition to that, Shariff *et al.* (2000) reported that, better child nutritional status was also associated with better educational achievement among children in Malaysia. Previous study by Biswas *et al.* (2009) suggested that, thin children will more probably become thin adult with low BMI in future and this could affect their work efficiency as well as increase the rate of mortality and mobility. While, Saha *et al.* (2008) have observed obese and overweight children in Kolkata aged 6 and 11 revealed that the obese and overweight group had significant higher in blood pressure, low high density lipoprotein and hypertriglyceridemia.

Therefore, this study will observe the child's nutrition status of employed and unemployed mothers aged 4-6 years old in selected kindergartens in Selangor, Malaysia. Moreover, a part from the above studies, no much studies have been reported on child nutritional status based on maternal employment status in Malaysia. So, this study is aims to observe child's nutritional status based on their employment status in children Selangor, Malaysia. Hopefully these

findings can become a guideline for better research in pediatrics nutrition in future and more effective intervention can be developed by corresponding organization to optimize child nutrition status in Malaysia.

MATERIALS AND METHODS

Sampling and sampling design: This is a cross-sectional survey of 142 children attending preschools in the selected kindergartens in Selangor, Malaysia. The subjects were selected based on simple random and convenience sampling. Nine kindergartens were selected by using a convenience (accidental) sampling. Seven out of nine kindergartens were taken at urban areas which were located in Port Klang and Puncak Alam. Whereas the rest were taken at rural area located in Ijok. Sample size were obtained by using sample size calculation formula adapted from Krejcie and Morgan (1970) and later added with 20% dropout.

Target group for this study was kindergarten children who aged >4.00 and <6.99 years old, children of selected kindergarten in Selangor, Malaysia, taken care by his/ her own mother and not having any medical disorder such as asthma, cleft palate/ lips, congenital heart failure, inborn error, diabetes mellitus and kidney diseases. While the exclusion criteria for this target group were children who <4.00 years old or >6.99 years old, children who are send to baby sitter, siblings who were registered in the same kindergarten and having medical disorder such as asthma, cleft palate/lips, congenital heart failure, inborn error, diabetes mellitus and kidney diseases.

Data collection: Consent form and questionnaires were given to the selected mothers while they were fetching up their children. Clear instructions were given to the mothers on how to fill in the form. To get the three day- food records, children's food intakes were recorded for two consecutive weekdays by the researcher during the school time. Meanwhile the mothers continued the food intake record at home on that particular two days and one on weekend day. Three-days-diet record was adopted from data collection technique in a study done by Soo *et al.* (2011). The mothers were given a clear briefing on how to fill in the child's diet record. They were given pictures of household measurement to estimate the portion size of food and beverages. The technique of food record was adapted from a study done by Lown *et al.* (2011). Diet 4 software and nutrient composition of Malaysian foods were used to analyze the nutrient content of each food and beverages ingested and later were compared with Recommended Nutrient Intakes for Malaysia (RNI).

Parents were allowed to bring back home the questionnaires and the forms were returned a week after the form was distributed. Finally, all the questionnaires were gathered and height and weight were taken and plotted on growth chart.

Feeding practices questionnaire: Feeding practices questionnaires that were used in this study has been converted into Malay version. The categories in age of initiation complementary feeding (0-3 months, 4-5 months, 6 months and 7-12 months) were modified from questionnaire created by Srivastava and Sandhu (2007). Breakfast habit was modified from Khairil *et al.* (2011) and according to frequency scale (every day, 3 times per week, 2 times per week, once a week, once in two weeks and never).

Anthropometry data: Children' standing height was measured using Body Meter SECA 206. The child will be asked to stand straight, heels together, arm at the side, shoulder relaxed and head in the Frankfort horizontal plane. The steps were repeated for three times to get an average of three

readings. The readings should be taken to the nearest 0.1 cm (Lee and Nieman, 2010). In order to measure child's weight, the child was asked to stand still on the middle of the scale's platform without touching anything around them. The child's weight was made sure to be equally distributed on both feet. Steps were repeated three times to get mean of three readings by using Digital Weighting Scale SECA 813. The readings were taken to the nearest 100 g. The anthropometrical data were later compared with the WHO growth standards and CDC growth reference.

Data analysis: Data entry and data analysis were carried out by using SPSS version 17.0. Demographic data was presented in the form of descriptive data. While, for categorical data, the results were presented in the form of percentage and frequency. To observe the difference of nutrient intake among employed and unemployed mother, two-way ANOVA was used. Whereas, in order to identify the difference of nutrient intake between maternal lengths of working hours, post-hoc test was used. Pearson rank correlation was used to find the correlation between maternal working hours and child nutrition status.

RESULTS

Characteristics of the study population: One hundred and forty-two subjects completed and returned the questionnaires (respond rate = 64.4%). Data for 19 of the 161 participants were excluded from this study because some of them were reported staying with grandparents and some were having diseases such as kidney disease and asthma. Table 1 shows the characteristics of the subjects and subject's mother. 52.8% (n = 75) of the subjects were boys while 47.2% (n = 67) were girls. The subjects that were enrolled in this study were children aged 4 to 6 years old. 15.5% (n = 22) were aged 4 years old, 39.4% (n = 56) and 45.1% (n = 64) were aged 5 and 6 years old, respectively. Majority of the subjects were Malay with 90.8% (n = 129) while 4.9% (n = 7) were Chinese and 4.2% (n = 6) were Indian. 63.6% (n = 90) of the subject lived in urban area while 36.6% (n = 52) lived in rural area. Table 1 also shows the descriptive variables of the mothers based

Table 1: Respondent's demographic data

Demographic information	n	Percentage
Sex		
Boys	75	52.8
Girls	67	47.2
Age		
4	22	15.5
5	56	39.4
6	64	45.1
Ethnic		
Malay	129	90.8
Chinese	7	4.9
Indian	6	4.2
Location		
Rural	52	36.6
Urban	90	63.4
Maternal employment status		
Unemployed	42	29.6
Employed	100	70.4

Table 2: BMI-for-age for children age 4-6 years old between employed and unemployed mothers based on WHO and CDC growth chart

Category	WHO		CDC	
	Unemployed (%)	Employed (%)	Unemployed (%)	Employed (%)
Severely wasted	17	8	36	27
Wasted	24	24	19	23
Normal	50	51	36	33
Overweight	10	4	10	4
Obese	0	13	0	13

on their employment status. Three quarter of the mothers were employed which contributes 70.4% (n = 100). While 29.6% (n = 42) were unemployed.

Prevalence of severely wasted, wasted, normal, at risk of obese and obese based on WHO and CDC growth chart: Table 2 shows the data of BMI-for-age for children of unemployed and employed mothers. In the severely wasted category (<3rd percentile) using WHO growth standard, unemployed mothers' children lead with 17% (n = 7) while 8% (n = 8) for employed mothers' children. Under the wasted (3-15th percentile) category, both unemployed and employed mothers have the same percentage which is 24% (n = 10) and (n = 24), respectively. Half of the children in both employed and unemployed mothers are reported to have normal BMI with 51% (n = 51) and 50% (n = 21), respectively. Additionally, 10% (n = 4) of unemployed mothers children were reported to be at risk of overweight while 4% (n = 4) of employed mothers children were at risk of being overweight. Table 2 also shows the prevalence of obesity among employed mothers' children were higher, 13% (n = 13) compared to unemployed mothers' children. None of unemployed children were reported to be obese.

Obviously, this study found that the proportion of children being severely wasted and wasted were considerably higher when using CDC growth chart. One-third of unemployed mothers' children were categorized under severely wasted (<5th percentile). While, 27% (n = 27) of employed mothers' children were categorized under <5th percentile. Among unemployed mothers' children, the prevalence of wasted (5-25th percentile) is 19% (n = 8), the prevalence of normal (25-85th percentile) is 36% (n = 15), the prevalence of at risk of overweight (85-95th percentile) is 10% (n = 4) and overweight (>95th percentile) is 0% (n = 0). Among employed mothers' children, the prevalence of wasted (5-25th percentile) is 23% (n = 23), the prevalence of normal (25-85th percentile) is 33% (n = 33), the prevalence of at risk of overweight (85-95th percentile) is 4% (n = 4) and overweight (>95th percentile) is 13% (n = 13), respectively.

Comparing subject's nutrient intake with recommended nutrient intake (RNI): Overall, mean energy intake of unemployed mothers' boys was 1663 kcal day⁻¹ and this was higher (124%) than the requirement of the RNI. Whereas, the mean calorie intake for boys of employed mothers was 1350 kcal day⁻¹ which was nearly equivalent (101%) to the recommended value. Apparently, the mean energy intake of unemployed mothers' girls was 1428 kcal day⁻¹ and the intake was higher (110%) than the requirement of the RNI. However, the mean calorie intake for girls of employed mothers was 1230 kcal day⁻¹ which was lower (95%) than the recommended value.

Surprisingly, mean intake of protein in both unemployed and employed mothers were dramatically higher than the RNI. Mean protein intake of unemployed mothers' boys was 64 g day⁻¹ and this was higher (278%) than the requirement of the RNI. Whereas, the mean

protein intake for boys of employed mothers was 51 g day⁻¹ which were higher (221%) compared to the recommended value. Meanwhile, the mean protein intake of unemployed mothers' girls was 55 g day⁻¹ and their intake was higher (239%) than the requirement of the RNI. While, the mean protein intake for girls of employed mothers was 48 g day⁻¹ which was higher (208%) than the recommended value.

It is clearly indicates that both boys from employed (48.71 g) and unemployed (60.33 g) mothers have exceeded the recommended nutrient intake level, respectively. While, for girls from employed mothers, their fat intake was 42.53 g which is within the range of recommended level. On the other hand, girls from unemployed mothers have exceeded the recommended range with fat intake 52.54 g.

Nevertheless, both employed and unemployed children did not achieve the recommended nutrient intake for calcium. The mean calcium intake of unemployed mothers' boys was 451 g day⁻¹ which was lower (75%) compared to the RNI. Whereas, the mean calcium intake for boys of employed mothers was 439 mg day⁻¹ which was also lower (73%) compared to the recommended value. Meanwhile, the mean calcium intake of unemployed mothers' girls was 393 mg day⁻¹ and this was 66% of the requirement of the RNI. While, the mean calcium intake for girls of employed mothers was 368 mg day⁻¹ which was 61% of the recommended value (Table 3).

Comparing mean nutrient intake among children of employed and unemployed mothers:

Table 4 shows the comparison of mean macronutrient intake among children of employed and unemployed mothers. A two-way between groups analysis was conducted to discover the impact of mother's working hours on energy, protein and fat intake of their child. Subject were divided into two main groups (Group 1: employed; Group 2: unemployed). There was a statistically significant different for maternal employment status in energy intake ($p = 0.001$). Post-hoc comparison using the Tukey HSD test indicated that the mean energy intake for the unemployed group was significantly different ($p = 0.007$) from the 35-40 h/week group.

Table 3: Energy and nutrient intake of the subjects (expressed as Mean±SD)

Nutrient	Unit	Boys				Girls			
		Employed		Unemployed		Employed		Unemployed	
		mothers	RNI (%)	mothers	RNI (%)	mothers	RNI (%)	mothers	RNI (%)
Energy	kcal day ⁻¹	1350.0±412	101	1663.0±426	124	1230.00±350	95	1428.00±370	110
Protein	g day ⁻¹	51.0±17.5	221	64.0±15	278	48.00±14	208	55.00±14.4	239
Fat	g day ⁻¹	48.7±19	-	60.0±19.1	-	45.53±16.6	-	52.54±17.4	-
Calcium	mg day ⁻¹	439.0±192	73	451.0±164	75	368.00±140	61	393.00±151	66

Table 4: Comparing mean macronutrient intake among children of employed and unemployed mothers (n = 142) using 3-day- diet records

Nutrient	Employed mother			Unemployed mother			F stat (df)	p-value
	Boys n = 57 (40%)	Girls n = 43 (30%)	Total n = 100 (70%)	Boys n = 18 (13%)	Girls n = 24 (17%)	Total n = 42 (30%)		
Energy (kcal)	1349.68	1230.42	1298.40	1663.28	1428.17	1528.93	12.51 (1,138)	0.001
Protein (g)	51.80	48.25	50.28	64.61	54.54	58.85	10.60 (1,138)	0.001
Fat (g)	48.71	42.53	46.06	60.33	52.54	55.88	10.19 (1, 138)	0.002

*The mean difference is significant value less than 0.05 level

Two-way ANOVA also shows the comparison of mean protein intake among children based on mother's working hours. There was a statistically significant different for maternal employment status in protein intake ($p = 0.001$). Post-hoc comparison using the Tukey HSD test indicated that the mean protein intake for the unemployed group was significantly different ($p = 0.014$) from the 35-40 h/week group.

There was a statistically significant different for mother's working hours on fat intake ($p = 0.002$). Post-hoc comparison using the Tukey HSD test indicated that the mean fat intake for the unemployed group was significantly different ($p = 0.024$) from the 35-40 h/week group.

Relationship between length of maternal working hours and child's nutrition status:

Child weight and working hour found to be positive poor correlation ($r = 0.16$, $p < 0.05$). There is a significant positive fair correlation ($r = 0.21$, $p < 0.05$) between child BMI and length of working hours. However, the correlation of length of working hour and child's height ($p = 0.745$) did not reach statistical significant which indicated, maternal working hours did not affect child's height.

Negative fair correlation were found between energy intake and length of working hours ($r = -0.270$, $p < 0.01$). Negative fair correlation were found between protein intake and length of working hours ($r = -0.265$, $p < 0.01$). Negative fair correlation were found between fat intake and working hours ($r = -0.243$, $p < 0.01$). While the correlation of length of working hour and calcium ($p = 0.523$) and iron intake ($p = 0.219$) did not reach statistical significant (Table 5).

Introduction to complementary feeding: Employed mothers showed higher percentage in initiating complementary feeding at 0-3 months, 12% ($n = 12$) compared to 4.8% ($n = 2$) for unemployed mothers. 21.4% ($n = 9$) of unemployed mothers and 18% ($n = 18$) of employed mothers initiated complementary feeding at age 4-5 months. Starting complementary feeding at appropriate age appeared to be higher among unemployed mothers, 59.5% ($n = 25$) compared to employed mothers, 52% ($n = 52$). 18% ($n = 18$) of unemployed mothers and 14.3% ($n = 6$) of employed mothers have started complementary feeding at age 7-12 months (Fig. 1).

The frequency of eating breakfast: In a breakfast frequency question, majority of unemployed mothers (74%) gave their children breakfast while only half of employed mothers (56%) gave breakfast to their children. Many employed mothers (27%) gave breakfast to their children 2 times a week whereas only 14% for unemployed mothers gave breakfast to their children 2 times a week. Only a few 3% of employed mothers and 2% of unemployed mothers, respectively never gave breakfast to their children (Fig. 2).

Table 5: Pearson rank of child nutritional status and mother's length of working hours

	r	p-value
Child weight	0.166*	0.490
Child height	0.028	0.745
Child BMI	0.208*	0.013
Energy (kcal)	-0.270**	0.001
Protein	-0.265**	0.001
Fat	-0.243**	0.004
Calcium	-0.054	0.523
Iron	-0.104	0.219

*Correlation is significant at the 0.05 level (2 tailed), **Correlation is significant at the 0.01 level (2 tailed)

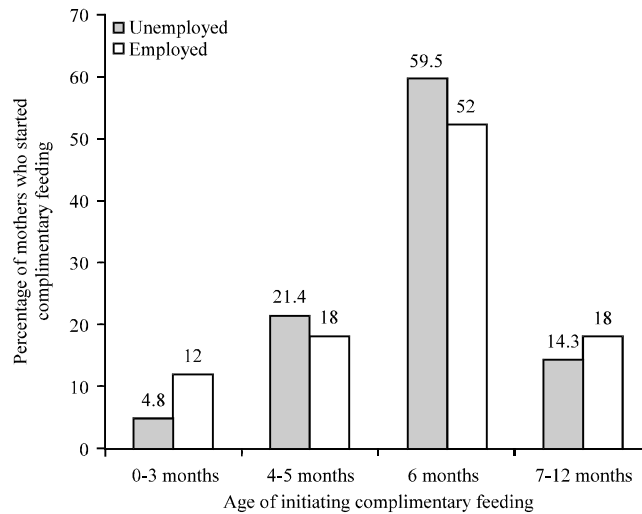


Fig. 1: Age of initiating complementary feeding in both employed and unemployed mothers

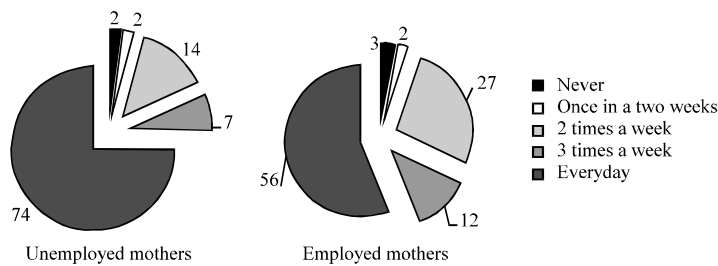


Fig. 2: Frequency giving breakfast to their children among unemployed and employed mothers

DISCUSSION

The prevalence of severely wasted and wasted in this study were noticeably high. The findings of this study were contradicted with a study in older children done by Zaini *et al.* (2005). The study exposed that, the prevalence of underweight was lower among the population in that study. Rural student seemed to be more underweight compared to urban student. Whereas, more urban student tended to be overweight and obese. In addition to that, a study done by Abdalla *et al.* (2009) stated that low parenting education, poor nutrition knowledge of the mothers, feeding practices and socioeconomic factors led to the prevalence of wasted among children under age of five in rural area of Sudan. Moreover, the prevalence of malnutrition was higher among children that come from poorer and larger household (Mian *et al.*, 2002).

In BMI-for-age classification, the percentage of overweight and obese children in this study did not differ in both CDC reference and WHO standard. While CDC reference seemed to underestimate the percentage of children with normal BMI. Nevertheless, CDC reference significantly overestimated the proportion of children to be severely wasted and wasted. This finding was also being supported by previous study done by Bosman *et al.* (2010). This was explained in a study by De Onis *et al.* (2007) which stated that CDC sample appears to be heavier as the US children are commonly heavier compared to all ages of children.

It is worth noting that, physical activity could be one the factor that contributed to low BMI- for- age among the children in this study even though their macronutrient intake were high.

Based on a research done by Pfeiffer *et al.* (2009), it is confirmed that BMI z-score was significantly related to children physical activity and older preschool children appeared to be more active compared to younger preschool children.

The finding was in line with the result reported by Dolinsky *et al.* (2011) who explored the correlation between sedentary time and physical activity among pre-school-aged children. The study reported that older children engage more moderate-to vigorous physical activity compared to younger children. The study also revealed that boys appeared to be more active compared to girls.

Obviously, the energy intake for boys in unemployed mothers were considerably higher than the recommended range. A study done by Williams *et al.* (2009) stated that, respondents who had never skipped breakfast had higher mean energy compared to respondent who skipped breakfast. The finding was in line with the results of this study where the mean energy intake were higher among children of unemployed mothers and the frequency of taking breakfast were also found to be higher in unemployed mothers children. Nevertheless, study in older children found that, school breakfast was not significantly associated with BMI or BMI category (Baxter *et al.*, 2010). Lacombe and Ganji (2010) recommended that pre-school children should take breakfast that is low in glycemic load in order to decrease hunger in children prior to lunch. However, the study found that there was no significant different between children who consumed low glycemic load food and high glycemic food in the amount of energy consumed during lunch.

According to a study done by Diethelm *et al.* (2011), high energy intake of children during evening meal were associated with a longer sleep duration at night which may reduce the risk for chronic disease in later life.

However, the mean intake of protein in both unemployed and employed mothers in this study was dramatically higher than the recommended level. This finding was in agreement with the result of study done by Gharib and Rasheed (2011). which indicated that mean protein intake among children in Bahrain was significantly higher than the recommended level.

Nevertheless, a study done by Larrea and Kawachi (2005) who found higher consumption of carbohydrate with lower intake of proteins in their sample in Ecuador. Another research found that, children with one employed parent tended to consume more vegetable-based protein compared to those with both unemployed parents (Lin *et al.*, 2011). In addition to that, a study done by Goon *et al.* (2011) revealed that parents from low socioeconomic families were not afforded to buy meat or fast food and their food items were mainly carbohydrate. The study also revealed that high prevalence of both chronic and acute malnutrition was observed in low-socioeconomic background. This finding has clearly shown that, those patterns of food intake could lead to poor child nutritional status.

Negative fair correlation was found between energy, protein, fat intake and length of working hours. This indicated that, children with mothers with longer working hours were more likely to be fed lesser by their mothers. While the correlation of length of working hour and calcium ($p = 0.523$) and iron intake ($p = 0.219$) did not reach statistical significant.

Child weight and working hour found to be positive poor correlation ($r = 0.16$, $p < 0.05$). This indicated that children with mothers with longer working hours were more likely to have increment in weight. However, the correlation of length of working hour and child's height ($p = 0.745$) did not reach statistical significant which indicated, maternal working hours did not affect child's height. There is a significant positive fair correlation ($r = 0.21$, $p < 0.05$) between child BMI and length of working hours. This indicated that children with mothers with longer working hours were more likely to have greater increase in BMI.

In addition to this, Hawkins *et al.* (2009) reported that children of employed mothers were more likely to be physically inactive and have poor dietary habit compared to children of unemployed mothers. This could be a factor that contributes to high BMI among children of employed mothers in this study. This study showed similarities with a previous study conducted at United States with respect to BMI. In that study, they have observed that an increase in length of mother's working hours was associated with an increased in their child's BMI (Morrissey *et al.*, 2011).

This study shows that prevalence of obesity among children of employed mothers were higher compared to children of unemployed mothers. Previous study done by Maher *et al.* (2008) claimed that obese children were among mothers who were employed part-time and have a mother with a bachelor degree. Al-Menabbawy *et al.* (2006) claimed that, obesity with sedentary lifestyle were closely related to systemic oxidative stress which eventually could reflects child's health and academic performance. The increasing availability and affordability to obtain fast food were associated with high prevalence of overweight and obesity among Asian children (Gonzalez-Suarez *et al.*, 2009).

Another study done by Rosas *et al.* (2011) with respect to prevalence of overweight and obesity of children in California reported that obese and overweight children were higher among employed mothers as compared to unemployed mothers. This suggested that employed mothers spend more time working and have less time to prepare healthy meal. In addition to that, employed mothers might heavily rely on fast food, take out and ready-to- eat food which are typically more calorie dense (Araneo, 2008).

Shoepe *et al.* (2011) demonstrated that there was higher proportion of obese and overweight pre-school children in low income families. This could be due to these families have less money to obtain proper nutrition which may contribute to the prevalence of overweight and obesity.

In term of complimentary feeding practices, employed mothers showed higher percentage in initiating complementary feeding at 0-3 months compared to unemployed mothers. Complementary feeding should not be initiated before 4 months and should not exceed 6 month because there is no scientific evidence that showed benefit in reducing allergic reaction Agostoni *et al.* (2008). Moreover, Hop *et al.* (2000) declared that early introduction of complementary feeding may also be associated with infectious diseases and increase the risk of nutrient imbalances.

Approximately quarter of employed (30%) and unemployed mothers (26.2%) initiated complementary feeding before 6 months of age. These findings found to be similar to the findings by Matthew *et al.* (2009) who reported that, majority of the mothers in the study introduced complementary foods to their children as early as 3 months. The finding in this study was quiet similar with a previous study done by Webb *et al.* (2009) which reported that unemployed mothers had lower proportion in both early and late timely introduction of complementary feeding as compared to employed mothers.

Maternal education level was found to be correlated with time of initiation of complementary feeding (Aggarwal *et al.*, 2008). It was reported that, high percentage of mothers that come from educated class have introduced complementary food to their infants at 6 months (Liaquat *et al.*, 2006). According to Olson *et al.* (2010), one of the reason mothers introduced cereals early to their infants was that they believe that cereals could help their infants sleep longer through the night without disturbing their friends or whoever they're living with.

Overall, this study suggest that unemployed mothers seemed to practice better child feeding practices in term of introduction to complementary feeding as they follow the recommended age of introducing complementary food compared to employed mothers.

The findings of this study was consistent with the findings done by Fertig *et al.* (2009) that found children who had frequent breakfast were higher among mothers who work <10 h/weeks as compared to full-time working mothers (>34 h/week). Difficulties getting up early in the morning found to be one of the factors that contributed to skip breakfast among children in Iran (Pinar Cakiroglu and Mahsa, 2007). Addition to that, Ramzan *et al.* (2010) explained that poor dietary habits were common among children aged 5-7 and 10-13 years old.

Another study done by Williams *et al.* (2009) stated that, respondents who have breakfast had higher mean energy compared to respondent who skipped breakfast. The study also found that respondent who consumed ready-to- eat cereal breakfast had the highest percentage of energy that derived form carbohydrate and had lowest percentage of energy that derived from fat as compared to respondent who skipped breakfast and consumed other breakfast.

Previous study showed similarities with this study where respondent who had frequent breakfast also had higher energy intake compare to breakfast skipper. This might be one of the reasons the mean energy intake among unemployed children was higher as compared to employed children since prevalence having breakfast was higher among unemployed children.

CONCLUSION

The findings of this study shows that both children of employed and unemployed mothers did not achieved the recommended nutrient intake. There were a significant correlation between maternal working hours and child's weight, BMI, energy, protein and fat intake. Length of maternal working hours was found to be associated with child's nutritional status. These findings are very important, a comprehensive nutrition program should be implemented to the children in this study in order to improve their nutritional status.

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