Impact of Intimate Partners' Violence Against Women on Immunization Status of Children in Bangladesh

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Abstract

Intimate partners' violence has harmful effect on child immunization. There is evidence regarding a relation between intimate partners' violence against women and immunization status of their children. To investigate this relation in Bangladesh, the data extracted from Bangladesh Demographic and Health Survey (BDHS) in 2007 is used and information from 1969 children's mother selected from intimate partners' violence module is utilized in this study. The analyses reveal that more than half of children's mother experienced intimate partners' violence and a considerable proportion of children aged 12-59 months are found not to be fully immunized. Intimate partners' violence against women has strong significant effect on child immunization in unadjusted as well as adjusted models.

I. Introduction

It is well known that the childhood vaccination reduces the child mortality significantly and is a cost effective way to improve child health, particularly for poor households located in high-disease environments[1-2]. Indeed, there is evidence that vaccination guards not only against a particular disease but also can provide a wide range of health benefits[3-4] making it a particularly valuable public health measure.

In Bangladesh according to UNICEF report on 'The state of world's children 2012', percentages of surviving infants who received single dose of BCG, three doses of DPT, three doses of polio and single dose of measles were 94, 95, 95 and 94 respectively in 2010. Prevention of illness and death from many important infectious diseases is caused by immunization[5]. Children who are not immunized in childhood are at increased risk of deficient and delayed mental development and they are also prone to develop different types of infectious diseases which sometimes fatal to them. Consequently, it may lead to poor school performance, decreased intellectual development, reduced adult size and decreased work capacities. A number of studies reveal the bio-medical and socio-economic risk factors of child immunization in Bangladesh but the psychological factors that may play a vital role on child vaccination has not been considered in their studies. It is well known that the Intimate Partners' Violence (IPV) against women is one of the important psychological factors. In India, Philippines, Egypt, Honduras, Kenya, Malawi, Rwanda and Chile, IPV was found as one of the potential risk factors for child health[6-9].

IPV has been defined as 'behavior within an intimate relationship that causes physical, sexual or psychological harm'[10-11]. The most common form of violence is the physical abuse inflicted upon the women by their intimate partners. This is increasingly becoming an essential public health issue due to considerable effect on woman's physical, sexual, mental and reproductive health[12]. IPV is highly prevalent in worldwide[12-13], particularly in South Asia[14-16]. In the WHO multi-country study, two sites from Bangladesh were included and 69% of the women had at least one experience of any form of partner violence. Lifetime physical violence was reported as 42% and 12% had experienced physical violence during pregnancy, 19% of the whole group of women had been severely physically abused at any occasion in their life[17].

It has been found in many studies that there exists a negative impact of IPV on maternal physical and mental health[18-20]. Consequently, this negative impact of IPV on women may directly or indirectly affect children. This may happen because abused mother may be physically and emotionally incapable of taking care of their children's basic needs[21-22]. A study[23] found that IPV is a cause of unintentional pregnancy and it adversely affects the mother's care taking behavior. IPV against women has also been considered as a risk factor for child abuse and maltreatment[24] and it in turn negatively affect the children's physical and mental health[25].

Now-a-days, IPV against women is not only viewed as a human right issue but also a public health issue. In countries with low level of awareness regarding IPV, the consequences of violence are perceived to be limited to women's death or severe bodily harm[26]. Nonetheless, in addition to injuries and deaths of women as a direct effect of violence, IPV can have adverse effect on use of child health services.

Immunization is the key child health service to prevent disease among children for ensuring better health. Research works linking health services use and IPV exposure are limited in current literature. A review study[27] found evidence of under-immunization among children of mothers exposed to IPV in developed countries. Similar finding was also observed in a study conducted in India[28].

Full immunization coverage has not yet been attained in Bangladesh[29]. In this paper, an attempt has been made to assess whether the IPV against women has an effect on the immunization status of their children in Bangladesh. For this

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purpose, bivariate and multivariate binary logistic regression analyses were conducted using the data from Bangladesh Demographic and Health Survey (BDHS) 2007.

II. Data, Measures and Methods

This paper exploits the data extracted from a nationally representative cross sectional survey BDHS 2007. Information from 1969 children's mothers selected from domestic violence module of the survey is utilized. To measure IPV, the BDHS 2007 collected information from ever - married women on whether they had ever experienced violent acts committed by their husbands. A women was considered to have undergone physical violence by her intimate partner if she replied affirmatively to any of the following queries - if her partner pushed, shook, or threw something at her; slapped; twisted arm or pulled her hair; punched her with his fist or with something that could hurt her; kicked, dragged, or beat; tried to choke or burn her on purpose, threatened or attacked with knife, gun, or any other weapon[29-31]. Sexual abuse was similarly determined by affirmative reply when asked if her partner ever physically forced her to have sexual intercourse with him even when she did not want to do so[29-30]. In this study, exposure of IPV is assessed using both physical and sexual violence. If all of the queries were negatively replied then she was reported as 'no violence'. For the government of Bangladesh, the Expanded Program on Immunization (EPI) is a priority program. This program follows the international guidelines recommended by the World Health Organization (WHO). According to the guidelines, children are considered fully immunized when they have received one dose of the vaccine of polio vaccine (excluding polio vaccine given at birth), and one dose of measles vaccine. WHO recommends giving hildren all of these 9 vaccines before their first birthday[32]. For this reason, we consider those children who are at age 12 months or more but born five years preceding the survey. IPV against women was the principal exposure of interest in this study. The other factors that may have influence on immunization status are also considered. These are sex of index child (male, female), residence type (urban, rural), mother's educational level (no education, primary, secondary, higher), partner's educational level (no education, primary, secondary, higher), partner's occupation (professional/business, agriculture worker, manual labor, unemployed/other), mother currently working status (no, yes), wealth index (poorest, poorer, middle, richer, richest), media exposure (no, yes),decision maker about child health (others except mother, mother with husband or others), age of mother (<30 years, $\geq$ 30 years), birth order of index children (1 - 2, 3-4, > 4).

The analysis of data includes a description of the study population followed by univariate and bivariate analysis to examine the pattern and differentials in the level of immunization by demographic and socio-economic characteristics. Finally, multiple logistic regression analysis was carried out to assess the net effects of the against tuberculosis (BCG), three doses each of the vaccine against diphtheria, pertussis and tetanus (DPT), three doses independent variables on the dependent variable. Note that the factors that are found to be statistically significant in the

bivariate analysis are only included in the regression models.

III. Results

In this study it is found that 16.5 percent of the children aged 12-59 months are not fully immunized. The prevalence of IPV is 51.6 percent. Among the children 51.1 percent are male and 34.3 percent reside in urban area. The rates of no education, primary, secondary and higher education for women are 30.0, 31.0, 32.4 and 6.6 percent respectively; whereas these rates are 36.2, 30.3, 23.4 and 10.1 respectively for their partners'. Regarding the occupation of partners 26.0, 26.6, 44.8 and 2.5 percent partners are professional/businessman, agricultural worker, manual labor and unemployed/other respectively. Among the respondents 17.6 percent are found to be in middle economic class whereas 44.7 percent are in poor class and 37.8 percent belong to the rich class. The maximum (71.7 percent) of index children were born when their mother's age is less than 30 years. It is found that 28.4 percent of index children were born when their mothers were too old ($\geq$ 30 years). Of the index children the birth order for 44.6 percent is three or higher.

To examine the association between the outcome variable of interest i.e. immunization status of children and other potential factors, we conducted bivariate analysis with chi-square test. Table 1 demonstrates the findings of the bivariate analysis. Among the factors, for sex of the index child, age of mother, mother's currently working status and place of residence, there is no statistically significant association with child immunization status; and the other variables are highly associated with the outcome variable with p-value < 0.01 except decision maker about child health which is associated with the outcome variable with p-value< 0.05.

The children whose mothers reported IPV, has lower likelihood to be fully immunized. The children of the rural area have lower chance to be fully immunized than those from urban area. It was found that education of mothers as well as fathers plays an important role on immunization status of children. The immunization status of children improves as education level of their parent increases. Fathers with occupation other than agriculture or manual labor have better immunization status for their children. The wealth index acts as a positive determinant for child immunization. The rates of fully immunization are 78.7, 82.5, 84.4, 85.0 and 88.1 percent in poorest, poorer, middle, richer and richest classes respectively. The first two children of mothers are found to be more immunized than the children with higher birth order.

In this paper, our main attempt to examine the impact of IPV on child immunization status. For this purpose, first we consider a simple binary logistic regression (Model 1) and then a multiple binary logistic regression (Model 2) controlling demographic factors and a multiple binary logistic regression (Model 3) controlling all factors of immunization. Note that in multiple regression models, we include the factors found significant in the bivariate analysis. The results of regression analysis are shown in

Table 1. Percentage of children with immunization status by exposure and socio-demographic characteristics, BDHS 2007.

Exposure and other socio-demographic characteristics	Immunization status of children	
	Not fully immunized	Fully immunized
	n (%)	n (%)
Intimate partner violence***		
No	130 (13.6)	823 (86.4)
Yes	195 (19.2)	821 (80.8)
Type of place of residence		
Urban	101 (14.9)	575 (85.1)
Rural	224 (17.3)	1069 (82.7)
Division***		
Dhaka	72 (16.6)	362 (83.4)
Chittagong	82 (21.1)	307 (78.9)
Barisal	43 (15.4)	236 (84.6)
Khulna	20 (8.4)	217 (91.6)
Rajshahi	31 (10.3)	271 (89.7)
Sylhet	77 (23.5)	251 (76.5)
Mother's education level***		
No education	149 (25.2)	442 (74.8)
Primary	103 (16.9)	507 (83.1)
Secondary	64 (10.0)	573 (90.0)
Higher	9 (6.9)	121 (93.1)
Father's education level***		
No education	154 (21.6)	559 (78.4)
Primary	103 (17.3)	494 (82.7)
Secondary	56 (12.1)	405 (87.9)
Higher	12 (6.1)	186 (93.9)
Mother currently working		
No	229 (15.9)	1209 (84.1)
Yes	96 (18.1)	435 (81.9)
Fathers' occupation***		
Professional or business	60 (11.7)	452 (88.3)
Agricultural worker	89 (17.0)	435 (83.0)
Manual labor	169 (19.1)	714 (80.9)
Unemployed or others	7 (14.0)	43 (86.0)
Media exposure***		
No	179 (21.3)	662 (78.7)
Yes	146 (12.9)	982 (87.1)
Wealth index***		
Poorest	99 (21.3)	365 (78.7)
Poorer	73 (17.5)	343 (82.5)
Middle	54 (15.6)	292 (84.4)
Richer	51 (15.0)	289 (85.0)
Richest	48 (11.9)	355 (88.1)
Decision maker about child health**		
Others except mother	92 (19.8)	372 (80.2)
Mother with husband or others	233 (15.5)	1272 (84.5)
Age of mother (in years)		
< 30	228 (16.1)	1184 (83.9)
≥ 30	97 (17.4)	460 (82.6)
Sex of child		
Male	163 (16.2)	844 (83.8)
Female	162 (16.8)	800 (83.2)
Birth order number***		
1-2	151 (13.9)	939 (86.1)
3-4	106 (17.4)	503 (82.6)
4+	68 (25.2)	202 (74.8)

Significance level: *** $p - value < 0.01$; ** $p - value < 0.05$; * $p - value < 0.10$

Table 2. Effects of IPV and other factors on child immunization status from multiple binary logistic regression models.

	Immunization status of children		
	Model 1	Model 2	Model 3
Explanatory variables	OR (95% CI)	OR (95% CI)	OR (95% CI)
IPV exposure			
No	1	1	
Yes	0.665(0.522, 0.847)***	0.622 (0.485, 0.799)***	0.701(0.541, 0.909)***
Birth order number			
1-2		1	1
3-4		0.825 (0.626, 1.087)	1.042 (0.778, 1.395)
4+		0.583 (0.418, 0.814)***	0.909 (0.626, 1.319)
Division			
Dhaka		1	1
Chittagong		0.708 (0.496, 1.011)*	0.670 (0.462, 0.972)**
Barisal		1.086 (0.718, 1.645)	1.092 (0.706, 1.687)
Khulna		2.019 (1.191, 3.423)***	1.772 (1.03, 3.048)**
Rajshahi		1.651 (1.05, 2.596)**	1.570 (0.985, 2.502)*
Sylhet		0.625 (0.433, 0.903)**	0.695 (0.474, 1.02)*
Mother's education level			
No education			1
Primary			1.392 (1.022, 1.896)**
Secondary			2.090 (1.4, 3.122)***
Higher			1.805 (0.728, 4.472)
Father's education level			
No education			1
Primary			1.022 (0.757, 1.382)
Secondary			1.219 (0.828, 1.794)
Higher			1.948 (0.879, 4.318)
Father's occupation			
Professional/business			1
Agricultural worker			0.851 (0.577, 1.256)
Manual labor			0.766 (0.546, 1.074)
Unemployed/others			0.952 (0.398, 2.278)
Wealth index			
Richest			1
Richer			1.021 (0.648, 1.609)
Middle			1.274 (0.79, 2.055)
Poorer			1.327 (0.826, 2.133)
Poorest			1.080 (0.666, 1.752)
Media Exposure			
Yes			1
No			0.750 (0.558, 1.009)*
Decision maker about child health			
Others except mother			1
Mother with husband or others			1.118 (0.843, 1.481)
-2 Log likelihood	1753.006***	1699.083***	1650.498***

Significance level: *** $p - value < 0.01$; ** $p - value < 0.05$; * $p - value < 0.10$

Table 2. Children whose mothers were exposed to IPV are 33.5(OR= 0.665) percent less likely to be fully immunized compared to the mothers not exposed to IPV (Model 1). After adjusting for demographic factors (Model 2) and all factors (Model 3), the risk of being fully immunized for the children of IPV exposed mother are 0.622 and 0.701 times respectively than that of non-exposed to IPV. These results are highly statistically significant. From Table 2, it is clear that the impact of IPV on child immunization was strengthened when the demographic variables were included with Model 1; but it was weakened when socio-economic variables were included with Model 2. Therefore, statistically significant demographic and socio-economic factors can be considered as the potential confounders for child immunization. The effects of IPV as well as birth order number of index children and the division they live in are statistically significant in Model 2. Children with birth order number greater than 4 are 51 percent less likely to be fully immunized than the first two children. Including IPV, mother's education, division and media exposure are also statistically significant in Model 3.

Mother's education has significant effect on child immunization status. The children of mothers with secondary education are 2.09 times as likely as to be fully immunized than the children of illiterate mothers. Moreover, children of non-media exposed parents are less likely to be fully immunized than those exposed. Note that impact of IPV on child immunization is still statistically significant after controlling demographic as well as socio-economic factors. It means that IPV plays an important negative role on child immunization. It is clear from values of -2 Log Likelihood that the Model 1, Model 2 and Model 3are statistically significant.

IV. Conclusion

The results of this study show the significant relationship between IPV and child immunization. Children of women exposed to IPV are less likely to be fully immunized than children of women not exposed to IPV both in unadjusted and adjusted models. It is well established that immunization is positively related to the child health[3-4]. Since IPV is found to statistically significant negative impact on child immunization, it is crucial to prevent IPV for a significant progress in vaccination uptake for the improved of child health in Bangladesh. Therefore, social scientists and other concerned needed to work together for the betterment of child heath in Bangladesh taking into account the immunization of children and violence against women. It is necessary to implement favorable policies and social movements to control the violence against women in Bangladesh.

References

1. Koenig, M. A., D. Bishai, M. A. Khan, 2001. Health interventions and health equity: the example of measles vaccination in Bangladesh. *Population and Development Review*, **27 (2)**, 283-302.

2. Brenzel, L., L. J. Wolfson, J. Fox-Rushby, M. Miller, N. A. Halsey, 2006. *Vaccine-Preventable Diseases. In:* D. T.

Jamison, J. G. Breman, A. R. Meashamet et al. (ed.). Disease Control Priorities in Developing Countries, Oxford University Press, New York.

3. G., Contreras, 1989. Effect of the administration of oral poliovirus vaccine on infantile diarrhoea mortality. *Vaccine*, **7 (3)**, 211-2.

4. Fonseca, W., B. R. Kirkwood, C. G. Victora, S. R. Fuchs, J. A. Flores, C. Misago, 1996. Risk factors for childhood pneumonia among the urban poor in Fortaleza, Brazil: a case-control study. *Bulletin of the World Health Organization*, **74**, 199-208.

5. Centers for Disease Control and Prevention, 1999. Ten great achievements in public health, 1900-1999. *MMWR Morb Mortal Wkly*, **48**, 243-48.

6. Leland, K. A., S. V. Subramanian, 2008. Domestic violence and chronic malnutrition among women and children in India. *Am J Epidemiol*, **167**, 1188-1196.

7. Kumar, S., L. Jeyaseelan, S. Suresh, R. C. Ahuja, 2005. Domestic violence and its mental health correlates in Indian women. *Br J Psychiatry*, **187**, 62-7.

8. Vizcarra, B., F. Hassan, W. M. Hunter, S. R. Muñoz, L. Ramiro, C. S. De Paula, 2004. Partner violence as a risk factor for mental health among women from communities in Philippines, Egypt, Chile, and India. *Int J Control Saf Promot*, **11**, 125-9.

9. Rico, E., B. Fenn, T. Abramsky, C. Watts, 2011. Association between maternal experiences of intimate partner violence and child nutrition and mortality: findings from Demographic and Health Surveys in Egypt, Honduras, Kenya, Malawi and Rwanda. *J Epidemiol Community Health*, **65(4)**, 360-7.

10. Krug, E. G., 2002. World report on violence and health xxii. World Health Organization, Geneva.

11. Finney, A., 2004. Alcohol and intimate partner violence: key findings from the research. London: Home Office.

12. Garcia-Moreno, C., H. A. Jansen, M. Ellsberg, Heise L, C. H. Watts, WHO Multi-country Study on Women's Health and Domestic Violence against Women Study Team, 2006 Prevalence of intimate partner violence: findings from the WHO multi-country study on women's health and domestic violence. *Lancet*, **368(9543)**, 1260-9.

13. Hassan, F., L. S. Sadowski, S. I. Bangdiwala, B, Vizcarra, L, Ramiro, C. S. De Paula, I. A. Bordin, M. K. Mitra, 2004. Physical intimate partner violence in Chile, Egypt, India and the Philippines. *Int J Control SafPromot*, **11**, 111-16.

14. Bates, L. M., S. R. Schuler, F. Islam, K. Islam, 2004. Socioeconomic factors and processes associated with domestic violence in rural Bangladesh. *Int Fam Plan Perspect*, **30**, 190-9.

15. Martin, S. L., A. O. Tsui, K. Maitra, R. Marinshaw, 1999. Domestic violence in northern India. *Am J Epidemiol*, **150**, 417-26.

16. Burton, B., N. Duwury, N. Varia, 2000. Domestic violence in India: a summary report of a multi-site household survey. International Center for Research on Women, Washington DC.

17. Monemi, K. A., 2008. The impact of violence against women on child growth, morbidity and survival. Digital comprehensive summaries of Uppsala Dissertations, from the faculty of medicine 366.

18. Hossain M. A., N. S. Sumi, M. E. Haque, B. Wasimul, 2014. Consequences of intimate partner violence against women on under-five child mortality in Bangladesh. *J Interpers Violence*, **29(8)** 1402 –1417.

19. Devries, K., C. Watts, M. Yoshihama, L. Kiss, L. B. Schraiber, N. Deyessa, C. Garcia-Moreno, 2011. Violence against women is strongly associated with suicide attempts: Evidence from the WHO multi-country study on women's health and domestic violence against women. *Soc Sci Med*, **73**, 79-86.

20. Rose, L., J. Alhusen, S. Bhandari, K. Soeken, K. Marcantonio, L. Bullock, P. Sharps, 2010. Impact of intimate partner violence on pregnant women's mental health: Mental distress and mental strength. *Issues Ment Health Nurs*, **31**, 103-111.

21. Levendosky, A. A., A. C. Huth-Bocks, D. L. Shapiro, M. A. Semel, 2003. The impact of domestic violence on the maternal-child relationship and preschool-age children's functioning. *J Fam Psychol*, **17**, 275-287.

22. Yount, K. M., A. M. Digirolamo, U. Ramakrishnan, 2011. Impacts of domestic violence on child growth and nutrition: A conceptual review of the pathways of influence. *Soc Sci Med*, **72**, 1534-1554.

23. Cheng, D., J. A. Dimer, E. B. Schwarz, E. Douglas, I. Horon, 2009. Unintended pregnancy and associated maternal preconception, prenatal and postpartum behaviors. *Contraception*, **79**, 194-198.

24. Herrenkohl, T. I., C. Sousa, E. A. Tajima, R. C. Herrenkohl, C. A. Moylan, 2008. Intersection of child abuse and children's exposure to domestic violence. *Trauma Violence Abuse*, **9**, 84-99.

25. Shay-Zapien, G., L. Bullock, 2010. Impact of intimate partner violence on maternal child health. *Am J Matern Child Nurs*, **35**, 206-212.

26. Fox, A. M., S. S. Jackson, N. B. Hansen, N. Gasa, M. Crewe, K. J. Sikkema, 2007. In their own voices: A qualitative study of women's risk for intimate partner violence and HIV in South Africa. *Violence Against Wom*, **13**, 583-602.

27. Bair-Merritt, M. H., M. Blackstone, C. Feudtner, 2006. Physical health outcomes of childhood exposure to intimate partner violence: a systematic review. *Pediatrics*, **117**, e278–90.

28. Sabarwal, S., M. C. McCormick, J. G. Silverman, S.V. Subramanian, 2012. Association between maternal intimate partner violence victimization and childhood immunization in India. *J Trop Pediatrics*, **58(2)**, 107-113.

29. National institute of population research and training (Bangladesh), Mitra and Associates (Firm), and Macro international, 2009. Bangladesh demographic and health survey, 2007. Dhaka, Bangladesh and Calverton, Maryland, USA.

30. Pallitto, C. C., P. O'Campo, 2004. The relationship between intimate partner violence and unintended pregnancy: analysis of a national sample from Colombia. *Int Fam Plan Perspect*, **30(4)**, 165-173.

31. Silverman, J. G., M. R. Decker, J. Gupta, N. Kapur, A. Raj, R. T. Naved, 2009. Maternal experiences of intimate partner violence and child morbidity in Bangladesh: evidence from a national Bangladeshi sample. *Arch Pediatr Adolesc Med*, **163(8):** 700-5.

32. Nasrin, A., B. Zainab, 2012. Determinants and status of vaccination in Bangladesh. *Dhaka Univ. J. Sci.*, **60(1)**, 47-51.