

ORIGINAL ARTICLE

Nurturing care among adolescent mothersTATI SUMIATI¹, SABARINAH² and AGUSTIN KUSUMAYATI²¹Public Health Department, Faculty of Health Science, Muhammadiyah Maluku Utara University;²Faculty of Health Science, University of Indonesia, Indonesia

DOI: 10.4081/jphia.2023.2606

Abstract. Many studies show the impact of adolescent mothers on child development. To prevent the impact of adolescent pregnancy, nurturing care is needed to support optimal children's development. This study aims to identify comprehensive nurturing care among adolescent mothers. This study used secondary data in the integration of the 2018 National Socioeconomic Survey and Basic Health Survey. To measure nurturing care, 5 components were used: health, adequate nutrition, security and safety, responsive caregiving, and opportunities for early learning with latent class analysis. The results of the analysis showed that 62% of adolescent mothers provided uncompleted nurturing care. About 21% of adolescent mothers need assistance in improving nurturing care related to adequate nutrition and learning opportunities, and 17% need assistance to improve health, nutrition, responsive caregiving, and opportunities for early learning. Adolescent mothers are in need of comprehensive nurturing care for their children. Practice is needed in order to enhance nurturing care initiatives, particularly for teenage mothers.

Introduction

There is still a high number of adolescent pregnancies in developing countries, including Indonesia, increasing motherhood in childhood, health risks to mothers also to their children. Adolescence is a phase of life to build human capital rather than endure another life (child) (1). Adolescents mothers can miss the opportunity to invest in the development of their human resources it will limit educational attainment, interfere with work participation, and have few financial resources. Indonesia Health Demographic Survey 2017 shows that among women aged 15 to 19 who have become mothers, 50% have an

education after elementary school, and 60% with the lowest level of wealth (2). Lack of financial readiness in young parents may not make optimal decisions about their child's education, care, and human capital investment (3).

From a psychological perspective, adolescents have a concrete and egocentric way of thinking. The consequence is to put their own needs above their child's needs (4), negative feelings, interaction, support, response, sensitivity (5,6). The low role and involvement of caregivers, particularly adolescent mothers in caregiving care, hinders children's opportunities for social interaction and affects their development (7).

Research from several countries has documented the negative consequences of adolescent mothers and child development. Children of adolescent mothers are more at risk of developing delayed cognitive, and social-emotional development (8-11). This confirms that multigenerational affects the development of children ranging from preconceptions, newborns, infants, preschoolers, childhood, adolescence, adulthood, and the elderly, and continues in the life cycle (12).

In improving the achievement of optimal child development, nurturing care is needed for conditions that can improve health, nutrition, security and safety, responsive care, and early learning opportunities. This component of nurturing care is contained in the nurturing care framework (12). An environment that is sensitive to health and nutrition needs, responsive, emotionally supportive, and stimulates and protects this development is characterized by the nurturing framework. Positive associations of care and health, and child growth and development are shown worldwide and supported by neuroscientific evidence that caregiving during childhood attenuates the detrimental effects of low socioeconomic status on brain development. The five components of the foster care framework consist of health (prevention and treatment of disease; immunization, routine child visits, and sanitation; water and hygiene), adequacy nutrition (dietary diversity, complementary foods, macronutrients and micronutrients, and breastfeeding (breast milk). Security and safety (reducing abuse, neglect, and violence against children, and birth registration), responsive care (feeding, parenting programs, nursing routines, and emotional development support), early learning opportunities (access to child care and preschool education quality, opportunities to explore and learn while at home, books, toys, and play materials) (13).

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Key words: Indonesia, adolescent mother, child, latent class analysis, nurturing care

Nurturing care addresses the child, family, and other caregivers and the places in which children interact. Interventions to strengthen family and caregiver capacities to have the knowledge and resources to provide caregiving are critical to supporting children's development. Analysis in Paraguay suggested that one of the inhibiting factors for nurturing care was adolescent mothers (14). Adolescent mothers have lower parenting skills than adult mothers (15). Empowerment of women, especially adolescent mothers, is needed so that they know their needs and abilities in providing optimal nurturing care. Thus, an analysis is needed that can combine all the essential needs of the child including health, nutrition, protection, care, and preschool education. This study is to identify comprehensive nurturing care among adolescent mothers.

Materials and methods

Research design and data source. This study applies secondary data analysis with data sources being the integration data of Indonesia National Social and Economic Survey March 2018 and Basic Health Research 2018. This study combines two socioeconomic and health-related data at the national level. To measure nurturing care, several variables are not present in riskesdas such as birth certificate ownership and preschool education in children aged 36 to 59 months. The merging of these two data sets complements the data that is not in Riskesdas. This study used a cross-sectional design. Nurturing care is a composite variable based on the child's infectious disease history, basic immunization of children, nutritional status based on TB/U, possession of birth certificates, development monitoring, and preschool education, History of infectious diseases is measured based on whether in the last 1 month, the child has diarrhea and/or ARI, completeness of basic immunizations, stunting, possession of birth certificates, examination of child growth and development and children's participation in pre-school education.

Participants. The study population was women who gave birth when they were less than 20 years old and had become parents in Indonesia. The sample in this study was mothers who had children aged 36 to 59 months, when pregnant the child was less than 20 years old and the number of births was 1 (primipara). Samples that met the criteria in this study and the completeness of data were 1,385 mothers.

Data analysis procedure. The description of the analysis consists of the proportion of each variable. Latent Class Analysis was used to identify the class of caregiving. The purpose of this analysis is to identify the class of latent variables (nurturing care), which consists of six indicator variables, namely: history of childhood infectious diseases, primary immunization of children, nutritional status based on height/age, ownership of birth certificates, monitoring of development, and preschool education. In this analysis using unconditional LCA (16). Several stages in the LCA analysis are first determining the number of classes identifying the optimal number of classes, starting with a 2-class model, and then adding the number of classes by 1 (k+1) for each subsequent analysis. After obtaining several models, a model selection is carried out based on the class model suitability criteria. The

second is the analysis of the membership quality of each case (child) in each class. Third Determine the class results from the study of latent class classification based on the proportion of respondents in each class and the proportion of each component variable of caregiving. The four decisions provide class names according to the main characteristics based on the proportion of each indicator variable (a component of nurturing care).

This research has received approval from the Health Research Ethics Committee, Faculty of Public Health, University of Indonesia, with the letter number: Ket-626/UN2. F10/PPM.00.02/2019. The publicly-accessible data used in our series of scientific papers was obtained from the Health Development Policy Agency with formal procedures through the Agency's public website (www.badankebijakan.kemkes.go.id).

Results

Table I shows that mothers who are pregnant with adolescents are mostly low in education and live in rural areas but more have high levels of welfare and high levels. Based on the care component, it shows that most do not attend preschool education, and there is no information related to developmental monitoring, incomplete immunization, and high enough stunted children.

Determination of the number of nurturing classes. Based on Table II, information was obtained that the AIC value in model 3 of the nurturing class in children conceived by mothers aged <20 years with the lowest score compared to models 2 classes and 4 classes. This shows that the 3-class model is the fittest. Based on the results of the LMR-adjusted LRT Test for 3 classes in children conceived by mothers aged <20 years, a value of 0.001 was obtained, meaning that the 3-class model was most suitable compared to the 3-class model. Although based on the model's match criteria with a P-value value of 0.08, it is significant with an alpha value of 0.1.

Quality classification of latent class membership. Table II shows an entropy value of 0.052 smaller than 0.60. In practice, it is very difficult to obtain the results of the analysis with entropy 1. In the 2nd class model, it was only 0.77, still not in the high entropy criteria (more than 0.80). Fig. 1 shows that mothers who are pregnant with adolescents are largely unable to provide comprehensive care.

Determination of class and Conclusion of class names. Furthermore, the analysis of Fig. 1 of the nurturing component for the model of 3 nurturing classes in the group of children conceived by mothers aged <20 years. Based on the picture below, shows that in class 1 it was found that there were 17.9% of children had a history of infectious diseases, 88.7% of basic immunizations were incomplete, 43.2% were very short/short, 34.7% did not have a birth certificate, 90.9% did not monitor child development and 88.7% did not attend preschool education. In class 2, it was found that 21.4% of children had a history of infectious diseases, 71.2% of basic immunizations were incomplete, 17.8% were very short/short, all children had birth certificates, 87.5% had no monitoring of child development

Table I. Overview of the characteristics and components of childcare care in adolescent mothers in Indonesia.

Variable	f	(%)
Maternal education		
Low	954	68.9
High	431	31.1
Welfare level		
Low	632	45.6
High	753	54.4
Region of residence		
Rural	927	66.9
Urban	458	33.1
History of pediatric infectious diseases		
Yes	248	17.9
Not	1,137	82.1
Basic child immunization		
Incomplete	891	64.3
Complete	494	35.7
Nutritional status based on TB/U		
Short/Very short	494	35.7
Usual	891	64.3
Birth certificate		
Doesn't have	298	21.5
Have	1087	78.5
Monitoring child development		
No information	1,008	72.8
Exist	377	27.2
Preschool education		
Not	1109	80.1
Yes	276	31.1

and 57.9% did not attend preschool education. In class 3, it was found that 14.7% of children had a history of infectious diseases, all children received complete basic immunization, 34.9% were very short/short, 11.1% did not have a birth certificate, 15.5% had no monitoring of child development and 81.1% did not attend preschool education.

Based on Fig. 2, the conclusion of 3 nurturing classes was drawn. The conclusions are presented in Table III.

Discussion

Adolescent pregnancy in Indonesia is still a problem for public health, especially maternal and child health problems. The results of the analysis showed that there were 32% of mothers had children aged 36 to 59 months pregnant when they were less than 20 years old. The results of another study showed adolescent fertility with the same criteria (less than 20 years), but different data sources (Indonesia Demography Health

Survey 2017) got the same percentage, namely 31.5% of first pregnant women at the age of fewer than 20 years (17). The results showed good validity.

The 32% finding in this study was slightly lower than in 2007's 34.8% (18). This means that in a decade it has only fallen by 2.8%. Of women who first give birth in adolescence; 86% are pregnant and give birth in a marital bond (17). In this study, all mothers were in marital status. The first strategy to prevent adolescent pregnancy is not to marry at the age of the child. Most child marriage decisions are made by their parents (19-22), even though parents have an obligation and are responsible for preventing child marriage (Law of the Republic of Indonesia Number 23 of 2002 concerning Child Protection, 2002). There are still many parents who do not understand that preventing child marriage is an obligation and responsibility, as well as an effort to protect their children (23).

The policy to delay pregnancy is to use contraception, but there is a fear for young couples that using birth control tools/ means will decrease fertility (24). Even though contraception does not reduce fertility, it only takes time to return to fertility considering that fertility for women aged less than 24 years is much faster than for women aged 24 years and over (25). Thus, it requires complete information regarding contraceptive birth control tools and the time to return to fertility after disconnection with contraceptive use for brides-to-be, both male, and female, especially for brides-to-be in their teens. Parents, through recitation, social gatherings, and civic activities, will obtain the same information to support their girls and/or daughters-in-law to immediately use contraception after marriage as an effort to delay pregnancy.

Adolescents who are already pregnant must get pregnancy care to ensure the health of the mother and fetus. Research in Kendal shows that 57% of adolescent mothers have done well in pregnancy care because they have received pregnancy care since the beginning of pregnancy, read MCH books, and attended classes for pregnant women. The most dominant factor in adolescent maternal pregnancy care practices is pregnancy acceptance (26). The pregnant women's class program is one of the programs that can increase awareness and ability of pregnancy care and readiness for childcare. The purpose of the pregnant women's class program is to educate pregnant women to be able to carry out pregnancy care, childbirth, and postpartum care, as well as through the early phases of the baby's life armed with basic knowledge, including childcare care (27).

Many factors directly influence the incidence of adolescent pregnancy. Several contextual factors indirectly lead to adolescent pregnancy among which is low education. Low education can lead to low knowledge of how to prevent pregnancy (2). The results of the analysis showed a relationship between low education and the incidence of adolescent pregnancy. Continuing school until at least secondary school can delay adolescent pregnancy (18,28-30). However, the pure participation rate (APM) in Indonesia shows that the lower the APM (31). Efforts are needed to accelerate the implementation of 12-year compulsory education targeting children less than 18 years old. The central and local governments should organize compulsory education at least the basic education level free of charge (32), while based on PP No. 47 of 2008 concerning Compulsory Education, states that local

Table II. Exploration of the number of nurturing care classes among adolescent mothers.

Model	AIC	BIC	-Log Likelihood	P	LMR Adjusted LRT test	Entropy
2 class	8965.9	9033.9	89.9	0.001	0.001	0.752
3 class	8946.2	9050.9	56.3	0.085	0.001	0.591
4 class	8946.3	9087.6	42.4	0.214	0.027	0.686

AIC, akaike information criteria; BIC, bayesian information criteria; LMR, Lo-Mendell_Rubin adjusted ratio test.

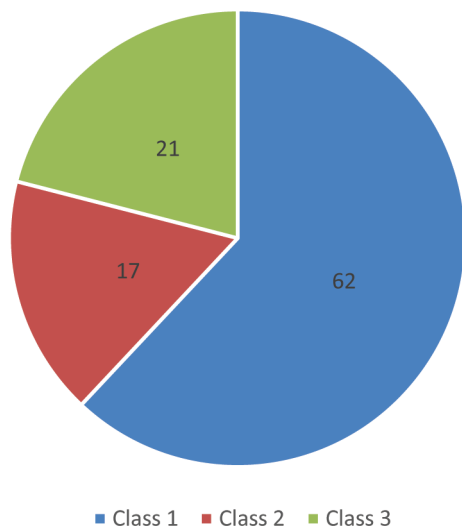


Figure 1. Overview of nurturing classes in adolescent pregnant women.

governments can improve the policy of compulsory education to secondary education. The word *can* on the one hand give local governments space to develop their regions, but on the other hand, no-obligation requires the government to carry out 12-year compulsory education (33). It takes a commitment from the local government to implement 12-year compulsory education for all children.

Nurturing care refers to an environment that seeks to improve five components, namely health, nutritional adequacy, security and safety, responsive parenting, and early learning opportunities for children (12). The study used a latent class of analysis (LCA) to identify childcare care by combining the five components. In the results of the analysis of the five components, three classes of childcare were identified.

The first class is the class that requires the support of all components of nurturing care. The results of the analysis showed that 6 out of 10 mothers who became pregnant with adolescents in Indonesia were unable to provide comprehensive nurturing care for their children. The results of this analysis are higher than previous studies which showed that 1 in 4 children need comprehensive care (34). Comprehensive nurturing care combines health, nutrition, security, and safety improvement support, responsive parenting, and early learning opportunities. According to WHO, UNICEF, and the World Bank states that this need

for care should be realized in a comprehensive program (12). Several articles asserting the need for a service system that incorporates all components of caregiving care and a nurturing care framework have represented the needs of this service system (7,35-37). The results of a study in Paraguay stated that one factor in nurturing care barriers is adolescents pregnancy. Strategic action for adolescent mothers is to focus on families and communities to increase caregiver knowledge, awareness, and ability through the provision of timely information and adequate support systems to provide caregiving care (14).

The intervention of health and nutrition components alone is not enough to support optimal child development, so other components that support each other (7). Another component that all children need is the experience of the surrounding environment in providing stimulation to improve development so that it becomes an opportunity for children to learn early (38). The results of this analysis found that all classes need early learning opportunity support for children as measured by preschool education participation. Preschool-age children experience increased development from all aspects of motor, cognitive, language, social-emotional, artistic, moral, and religious values, as well as building the foundation of school preparation (39,40). The proportion of children who have attended preschool education is 22.4%, although the target in 2019 is 77.2% (41). This shows that there is still no achievement of development targets related to preschool education. The Ministry of Education and Culture's strategic plan from 2010 to 2014 and 2015 to 2019, has clearly stated the target, but until 2019 it has not been achieved according to the target. Some possible causes of low participation rates in Early Childhood education are low public awareness of the importance of early childhood education, limited access to Early Childhood education services, and the inability of communities to finance ECCE (42). Early childhood education is not only formal and non-formal education but also informal education. Early childhood education on the informal track consists of family education (43). However, not all families can provide educational services for their children because of economic demands, advances in science and technology, and the ability to provide education services at home (44).

The proportion of children who are very short/short is 29.2% based on the 2015-2019 RPJMN target, 2019 reducing stunting to 28%. Very short/short is a growth disorder that lasts from the time of pregnancy to 24 months of age which indicates a long-term occurrence and cumulative

Table III. Conclusion nurturing care class names.

Class	Description	Conclusion
1st class	The five components of nurturing care shown are relatively low.	This class requires complete (comprehensive) nurturing care support.
2nd class	Of the five components of nurturing care, 4 components are relatively low.	This class requires health and nutrition-related nurturing care support (infectious disease prevention, complete immunization, and <i>stunting</i> prevention), responsive nurturing, and early learning opportunities.
3rd class	Of the five components of nurturing care, 3 components are relatively low.	This class requires related to health and nutrition components (prevention of infectious diseases and <i>stunting</i>), as well as early learning opportunities.

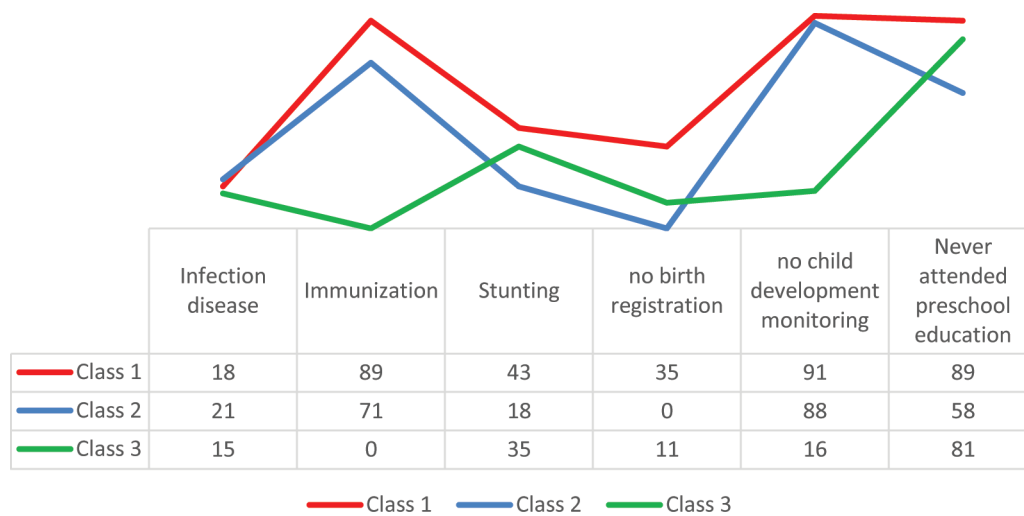


Figure 2. Overview of the 6 components of nurturing care among adolescent mothers.

impact of inadequate nutrition, health, and care. According to Engle, care includes everything from pregnancy care to breastfeeding, stimulation, hygiene behaviors, treatment seeking, and food preparation and storage (45). The results of the analysis showed that there was a relationship between adolescent pregnancy and short/very short nutritional status. If pregnancy occurs before the mother's age of more than 20 years is at risk to the development of the fetus and also the health of the mother (46). If a girl's nutritional intake is adequate, then the growth of body organs and reproductive organs is functioning properly. Nutritional status before conception greatly affects the incidence of BBLR and stunting (47-51).

The proportion of children with a history of infectious diseases is 18%. Vulnerable social characteristics (low maternal father's education, father's age <20 years), low level of well-being, and staying in rural areas) and low maternal power to make decisions in the household increases the child's risk of infection including diarrhea and ARI (52).

The proportion of children who do not have birth certificates is 16.6%. Not having a birth certificate violates a child's basic rights and may hinder a child's access to health services including ensuring the child has received age-appropriate immunizations and applying the correct growth standards (53).

Several studies discuss sociodemographic and economic factors with birth registration. The results of the analysis showed that there was a relationship between adolescent pregnancy and birth certificate ownership Research in Ghana showed that there was no difference in childbirth registration between mothers aged 15-19 years and those over 19 years (54). Other studies have shown that mothers who are less than 24 years old mostly have less knowledge regarding birth registration and also do not register the birth of their children (55).

The results of this study can show the results of the analysis of nurturing care which shows 5 components in one unit. The weakness of this study is that it cannot measure the indicator variables for components of nurturing care, such as violence, abuse, and neglect of children to measure the components of security and safety and the role of home education as an opportunity for early learning for children. It is hoped that further research can combine indicator variables for each component of nurturing care as a whole.

Conclusions

This research shows that there is a high need for comprehensive nurturing care support for adolescent mothers in Indonesia. Therefore, it needs program support that can assist mothers to

1 provide comprehensive care, especially for mothers who are
2 pregnant with adolescents.

4 Availability of data and materials

6 Data and materials are available from the corresponding
7 author upon request.

9 Conflict of interest

11 The authors declare no potential conflict of interest.

13 Accepted: 1, June 2023; submitted: 15, March 2023.

15 References

17. Mollborn S and Dennis JA: Explaining the early development and health of teen mothers children. *Sociol Forum (Randolph N J)* 27: 1010-1036, 2013.
18. BPS, BKKBN, Ministry of Health RI, USAID. 2017 Demographic And Health Survey. Jakarta, pp606, 2018.
19. Duncan GJ, Lee KTH, Rosales-Rueda M and Kalil A: Maternal age and child development. *Demography* 55: 2229-2255, 2018.
20. Belsky J and Barends N: Personality and Parenting. In: Bornstein MH, (ed). *Handbook of Parenting*. New York, Lawrence Erlbaum Associates, Inc, pp415-438, 2002.
21. Leslie K and Dibden L: Adolescent parents and their children-The paediatrician's role. *Paediatr Child Health* 9: 561-564, 2004.
22. Lewin A, Mitchell SJ and Ronzio CR: Developmental differences in parenting behavior: Comparing adolescent, emerging adult, and adult mothers. *Merrill-Palmer Quarterly (Wayne State University, Press)* 59: 23-49, 2013.
23. Black MM, Behrman JR, Daelmans B, Prado EL, Richter L, Tomlinson M, Trude ACB, Wertlieb D, Wuermli AJ and Yoshikawa H: The principles of Nurturing Care promote human capital and mitigate adversities from preconception through adolescence. *BMJ Glob Heal* 6: e004436, 2021.
24. Falster K, Hanly M, Banks E, Lynch J, Chambers G, Brownell M, Eades S and Jorm L: Maternal age and offspring developmental vulnerability at age five: A population-based cohort study of Australian children. *PLoS Med* 15: e1002558, 2018
25. Prado EL, Abbeddou S, Adu-afarwuah S, Arimond M, Ashorn P, Ashorn U, Bendabenda J, Brown KH, Hess SY, Kortekangas E *et al*: Predictors and pathways of language and motor development in four prospective cohorts of young children in Ghana, Malawi, and Burkina Faso. *J Child Psychol Psychiatry* 11: 1264-1275, 2017.
26. Firk C, Konrad K, Herpertz-dahlmann B, Scharke W and Dahmen B: Cognitive development in children of adolescent mothers: The impact of socioeconomic risk and maternal sensitivity. *Infant Behav Dev* 50: 238-246, 2018.
27. Khatun M, Mamun A AI, Scott J, William GM, Clavarino A and Najman JM: Do children born to teenage parents have lower adult intelligence? A prospective birth cohort study. *PLoS One* 12: e0167395, 2017.
28. World Health Organization, United Nations Children's Fund, World Bank Group. *Nurturing care for early childhood development: A framework for helping children survive and thrive to transform health and human potential*. Geneva, World Health Organization, 2018.
29. Black MM, Walker SP, Fernald LCH, Andersen CT, Digirolamo AM, Lu C, McCoy DC, Fink G, Shawar Y, Shiffman PJ, *et al*: Advancing early childhood development: From Science to Scale I Early childhood development coming of age: Sciencethrough. *Lancet* 6736: 77-90, 2017.
30. Vallejos J, Landers C and Schiavo R: Barriers and opportunities for young caregivers to provide nurturing care in low-income communities of Paraguay. *Int J Child Heal Hum Dev* 12: 319-334, 2019.
31. Corcoran J, Franklin C and Bennett P: Ecological factors associated with adolescent pregnancy and parenting. *Soc Work Res* 24: 29-39, 2000.
32. Wang J and Wang X: Structural Equation Modelling Application Usiang Mplus. Second. Balding DJ, Cressie NA, Fitzmaurice GM, Goldstein H, Molenberghs G, Scott DW, *et al*. editors. West Sussex, John Wiley & Sons Ltd, 2020.
33. Purbowati A: Adolescent fertility in indonesia: Relation between teenage childbearing and women educational attainment. *J Kependud Indones* 14: 153-164, 2019.
34. WHO. *Adolescent Pregnancy Situation in South East ASIA Region*. India, WHO Press, 2014.
35. Bicchieri C and Lindemans JW: A social norms perspective on child marriage: 1-21, 2014.
36. McDougal L, Jackson EC, McClendon KA, Belayneh Y, Sinha A and Raj A: Beyond the statistic: Exploring the process of early marriage decision-making using qualitative findings from Ethiopia and India. *BMC Womens Health* 18: 144, 2018.
37. Stark L: Poverty, consent, and choice in early marriage: Ethnographic perspectives from urban tanzania. *Marriage Fam Rev* 54: 1-17, 2018.
38. Republik Indonesia. Undang-Undang RI nomor 23 tahun 2002 Tentang Perlindungan Anak [Internet]. Sekretaris Negara RI, 23 tahun 2002 Indonesia; p698-703, 2002. Available from: <http://dx.doi.org/10.1016/j.jher.2011.03.002><http://dx.doi.org/10.1016/j.marpolbul.2013.12.024><https://repositorio.ufsc.br/bitstream/handle/123456789/186602/PPAU0156-D.pdf?sequence=-1&isAllowed=y><http://journal.stainkudus.ac.id/index.php/equilibrium>.
39. Hasan U, Muskibah, Suhermi, Sasmiar, Pahlefi. *Legal Counseling on the Role of Parents, Teachers and Society in Preventing Early Marriage*. Karya Abdi 5: 52-61, 2021.
40. Mardi A, Ebad A, Shahbazi S, Esmaelzade Saeieh S and Behboodi Moghadam Z: Factors influencing the use of contraceptives through the lens of teenage women: A qualitative study in Iran. *BMC Public Health* 18: 202, 2018.
41. Gayatri M: Dispelling the myths of infertility following contraceptive discontinuation: Survival analysis of the 2007, 2012 and 2017 indonesia demographic and health survey calendar data. Universitas Indonesia, 2019.
42. Khafidhoh N and Widjanarko B: Analysis of factors influencing early pregnancy care practices in North Coast of Kendal District. *J Kebidanan* 7: 50-61, 2018.
43. Ministry of Health RI. *Classroom training for pregnant women and toddlers for health workers*. Jakarta, Kementerian Kesehatan RI, 2009.
44. Chung HW, Kim EM and Lee JE: Comprehensive understanding of risk and protective factors related to adolescent pregnancy in low- and middle-income countries A systematic review. *J Adolesc* 69: 180-188, 2018.
45. Effendi DE, Handayani L, Nugroho AP and Hariastuti I: Adolescent pregnancy prevention in rural Indonesia: A participatory action research. *Rural Remote Health* 21: 1-12, 2021.
46. Kunnuji MON, Eshiet I and Nnorom CCP: A survival analysis of the timing of onset of childbearing among young females in Nigeria: Are predictors the same across regions? *Reprod Health* 15: 173, 2018.
47. KPPA and BPS: Indonesian child profile 2019 [Internet]. Kementerian Perencanaan Perempuan dan Perlindungan Anak (KPPPA). pp378, 2019. Available from: https://www.kemenpppa.go.id/lib/uploads/list/15242-profil-anak-indonesia_-2019.pdf.
48. Presiden Republik Indonesia. Undang-Undang RI No. 20 Tahun 2003 tentang Sistem Pendidikan Nasional (Law No. 20 of 2003 concerning the National Education System). No. 20 Tahun 2003, 2003.
49. Ikrom A, Taufik A, Hendri A, Febri A, Prayitno H, Darmawan R, Sudarno R, *et al*: Roadmap of 12-year education in Indonesia. Koesoema D, (ed). Jakarta, Jaringan Pemantau Pendidikan Indonesia (JPPI), pp1-172, 2015.
50. Sumiati T: Effect Adolescent Pregnancy on Nurturing Care In Indonesia. Universitas Indonesia, 2022.
51. Black MM, Lutter CK and Trude ACB: All children surviving and thriving: Re-envisioning UNICEF's conceptual framework of malnutrition. *Lancet Glob Heal* 8: e766-e767, 2020.
52. Britto PR, Lye SJ, Proulx K, Yousafzai AK, Matthews SG, Vaivada T, Perez-Escamilla R, Rao N, Ip P, Fernald LCH, *et al*: Nurturing care: Promoting early childhood development. *Lancet* 389: 91-102, 2017.
53. Zhou S, Zhao C, Huang X, Li Z, Ye R, Shi H, Zhao Q, Zhou Y, Chen X, O'Sullivan M, *et al*: The effect of a community-based, integrated and nurturing care intervention on early childhood development in rural China. *Public Health* 167: 125-135, 2019.
54. Montessori M: Early Development from Birth to Age 6 [Internet]. Apple Montessori Schools, 2017. Available from: <https://apple-montessorischools.com/early-development-well-birth-age-6/>
55. Ministry of Education and Culture Indonesia. Technical Guidelines for organizing playgroups). Direktorat PAUD dan DIKMAS, 2015.

- 1 40. Texas Child Care Quarterly. Infant caregiving : How to
2 be responsive [Internet]. Vol. 39, TEXAS CHILD CARE
3 QUARTERLY-Spring. 2016. Available from: [https://www.child-
4 carequarterly.com/backissu_spring16.php](https://www.child-carequarterly.com/backissu_spring16.php).
- 5 41. Ministry of National Development Planning Indonesia.
6 Presidential Regulation of the Republic of Indonesia
7 No. 2 of 2015 concerning the National Medium-Term
8 Development Plan 2015-2019 [Internet]. Kementerian
9 Perencanaan Pembangunan Nasional, No 2 Tahun 2015
10 Indonesia, pp1-311, 2014. Available from: [https://www.huku-
11 monline.com/pusatdata/detail/lt54d46d836eaf0/node/328/
12 perpres-no-2-tahun-2015-rencana-pembangunan-jangka-meneng-
13 gah-nasional-tahun-2015-2019](https://www.hukumonline.com/pusatdata/detail/lt54d46d836eaf0/node/328/perpres-no-2-tahun-2015-rencana-pembangunan-jangka-menengah-nasional-tahun-2015-2019).
- 14 42. Ministry of Education and Culture Indonesia. Ministry of
15 Cultural Education Strategic Plan 2020-2024). Jakarta:
16 Kementerian Pendidikan dan Kebudayaan Indonesia, 2020.
- 17 43. Parihin. Dissemination of RAN PAUD HI and the Framework
18 for Nurturing Care in its Contribution to stunting prevention:
19 East Lombok Government [Internet]. Tanato Foundation.
20 Indonesia, pp6, 2022. [http://pendis.kemenag.go.id/file/
21 dokumen/uuno20th2003ttgsisdiknas.pdf](http://pendis.kemenag.go.id/file/dokumen/uuno20th2003ttgsisdiknas.pdf). Available from:
22 [http://stpi-binainsanmulia.ac.id/wp-content/uploads/2013/04/Lamp_
23 2_UU20-2003-Sisdiknas.doc](http://stpi-binainsanmulia.ac.id/wp-content/uploads/2013/04/Lamp_2_UU20-2003-Sisdiknas.doc).
- 24 44. Supriyono, Iskandar H, Gutama. Family Education in the forma-
25 tion of national character [Internet]. Satu. Jakarta, Kementerian
26 Pendidikan dan Kebudayaan Indonesia, pp79, 2015. Available
27 from: [http://repositori.kemdikbud.go.id/6173/1/PKPKB OK
28 PRINT.pdf](http://repositori.kemdikbud.go.id/6173/1/PKPKB_OK_PRINT.pdf).
- 29 45. Engle PL, Menon P and Haddad L: Care and Nutrition: Concept
30 and Measurement. Washington DC, 1996.
- 31 46. Afifah T: Early marriage and the impact of nutritional status on
32 children (analysis of riskesdas data 2010). 34: 109-119, 2011.
- 33 47. Fikawati S, Syafiq A and Karima K: Maternal and Child
34 Nutrition. 1st ed. Jakarta, Rajawali Press, 2015.
- 35 48. Kassa GM, Arowojolu AO, Odukogbe AA and Yalew AW:
36 Adverse neonatal outcomes of adolescent pregnancy in north-
37 west Ethiopia. PLoS One 14: e0218259, 2019.
- 38 49. WHO. Adolescent Pregnancy [Internet]. WHO fact-sheet.
39 2018 [cited 2019 Jan 20]. Available from: [https://www.who.int/
40 news-room/fact-sheets/detail/adolescent-pregnancy](https://www.who.int/news-room/fact-sheets/detail/adolescent-pregnancy).
- 41 50. Wanimbo E and Wartiningih M: The relationship between mater-
42 nal characteristics and the incidence of stunting baduta (7-23 months).
43 J Manaj Kesehatan Yayasan RS Dr. Soetomo 6: 83-93, 2020.
- 44 51. Nguyen PH, Scott S, Neupane S, Tran LM and Menon P: Social,
45 biological, and programmatic factors linking adolescent preg-
46 nancy and early childhood undernutrition: A path analysis of
47 India's 2016 National Family and Health Survey. Lancet Child
48 Adolesc Heal 3: 463-473, 2019.
- 49 52. Nasrullah M, Zakar R, Zakar MZ and Krämer A: Girl-child
50 marriage and its association with morbidity and mortality of
51 children under 5 years of age in a nationally-representative
52 sample of Pakistan. J Pediatr 164: 639-646, 2014.
- 53 53. Jeong J, Bhatia A and Fink G: Associations between birth registration
54 and early child growth and development: Evidence from 31 low- and
55 middle-income countries. BMC Public Health 18: 673, 2018.
- 56 54. Amo-Adjei J and Annim SK: Socioeconomic determinants of birth
57 registration in Ghana. BMC Int Health Hum Rights 15: 14, 2015.
- 58 55. Isara A and Atimati A: Socio-demographic determinants of birth
59 registration among mothers in an urban community in southern
60 Nigeria. J Med Trop 17: 16, 2015.